

Wired for nature

A mixed method study of environmentally conscious digital users' connections to nature in Australia and the United States

Melusine Martin

James Cook University, Australia

✉ melusine.martin@my.jcu.edu.au

Abstract

In the digital age, technology increasingly shapes environmental engagement, transforming how individuals perceive the natural world. While digital tools support awareness of environmental issues such as climate change, pollution and deforestation, they also challenge the quality of nature experiences. This mixed-methods study investigates how environmentally conscious digital users conceptualise nature, interact with it, and balance screen time with nature time. Data collection involved an online survey of 220 Australian and American participants, and semi-structured interviews. Descriptive statistics and thematic analysis were used to examine participants' perceptions and practices regarding nature and digital technology. Findings show that digital technology is largely perceived as a mediator – not an obstacle – to nature connection. When used intentionally, especially alongside voluntary digital disconnection, it is seen as a neutral tool that can foster positive engagement with nature. Although participants strongly identified as part of nature, they maintained culturally embedded human-nature dualisms, particularly around human-made objects, including digital devices. The study also introduces the concept of digital solastalgia – the emotional distress experienced through witnessing environmental degradation online. Findings illustrate the complex ways individuals navigate their relationships with nature in the digital age, challenging binary framings of nature engagement as either online or offline, and suggesting a more hybrid understanding of human-nature-technology interactions.

Keywords: nature connection; digital media; environmental engagement; digital solastalgia; voluntary digital disconnection

1. Introduction

While digital technologies have been increasingly studied for their role in raising environmental awareness and promoting pro-environmental behaviours (PEBs), less attention has been given to the conceptual implications of interacting with nature through both digital and physical means. Research is lacking on the tensions people experience when navigating digital and natural spheres in everyday life.

This study aims to address this gap by asking: How do environmentally conscious digital users conceptualise and experience their connection to nature in a digital context? It investigates the extent to which digital engagement can support and/or hinder interactions with nature and associated behaviours.

Using a mixed-methods design, the research combines an online survey of 220 participants from Australia and the United States with semi-structured interviews. Descriptive statistics and thematic analysis were used to identify patterns and meanings in participants' accounts of their relations to nature and technology. This research is novel in that it centres on environmentally conscious digital users – a group that is underexplored yet highly relevant in the context of a media-saturated environmental crisis. Their experiences, including information sharing, digital activism, and practices of digital self-regulation, have implications for both environmental advocacy and digital sustainability. Understanding their experiences may provide insight into emerging strategies for balancing technology use with sustainable engagement to nature.

This article is structured as follows: Section 2 reviews the literature on human-nature (dis)connection, digital environmentalism, and voluntary digital disconnection. Section 3 details the explanatory sequential mixed methods design, including data collection (online survey and semi-structured interviews) and data analysis (descriptive statistics and thematic analysis). Section 4 presents the quantitative and qualitative findings obtained from descriptive statistics and thematic analysis. Section 5 discusses the theoretical and practical implications of the results for human-nature-technology relationships. And section 6 concludes with theoretical contributions, limitations, and directions for future research.

2. Literature review

2.1 Nature connection and human-nature dualism

In an era of hyper-mediated environmental crisis – constructed and understood through digital media and technologies – supporting human-nature connection has never been more important. It is now accepted that human activities – greenhouse gas emissions, pollution, deforestation – have led to climate change and biodiversity loss (Shivanna, 2022). The environmental crisis is a crisis of human behaviour. Shifting towards sustainability requires a deeper understanding of the external and internal motivations that drive human behaviours towards nature (Wamsler et al., 2021). Nature connection, a key concept in environmental psychology referring to the subjective sense of oneness with nature that comes from the connection between an individual's self-concept and natural environments, has been studied for decades (Clayton et al., 2021). It encompasses cognitive, emotional, and behavioural dimensions (Cuadrado et al., 2022), and is consistently associated with PEBs, extending personal engagement with nature into broader social and ecological benefits (Guazzini et al., 2025). Research also suggests that digital nature exposure can positively impact nature connection, and subsequent PEBs, promoting conservation efforts in the digital age (Meng et al., 2023).

Yet, in apprehending human-nature relationships, the very notion of *nature* remains ambiguous, shaped by historical, cultural, and political forces. Some approaches to nature connection inadvertently reproduce Western dualisms of human separation and superiority that lie at the root of the ecological crisis (Christens et al., 2025). The human-nature dualism – rooted in colonial, religious, and capitalist narratives – persists through binaries such as wild/urban or real/virtual, and in the assumption that one can be “disconnected” from nature. Even integrated models like socio-ecosystems may reinforce this divide by traditionally framing humans and nature as two distinct systems – one controlling the other – rather than as mutually interdependent (Boulangeat et al., 2022). Postdigital theory also challenges fixed definitions of nature by examining how digital technologies shape perceptions, experiences, and representations of the natural world, blurring the line between digital and real, and influencing environmental awareness and behaviour (Reed, 2024). As digital nature experiences become increasingly part of daily life,

particularly in urban contexts (Brambilla et al., 2022), reconnecting with nature demands a critical redefinition of nature itself – one that moves beyond dualisms and towards more relational, plural, and inclusive understandings (Alves & Vidal, 2024).

2.2 The role of digital technology in environmental activism

Digital technology's role in environmental activism has undergone a marked transformation. Initially framed as a source of disconnection from nature (Michaelson et al., 2020), digital devices are now recognised as a complement to physical environmental experiences (Reese et al., 2022) and, increasingly, as a primary vector of initial exposure to the natural world, with the potential to foster interest and attitudes towards physical nature (Lam et al., 2025). Virtual technology and digital media – including social media, online platforms, and mobile applications – are increasingly recognised as effective tools supporting environmental education and raising awareness of environmental issues such as climate change (Hajj-Hassan et al., 2024). They are now integral to contemporary environmental advocacy, enabling information dissemination, communities mobilisation, and influencing public opinion on climate-related issues. Digital environmental advocates leverage platform-specific content strategies – including educational reels, viral sustainability challenges, and behind the scenes looks at zero-waste living – to make environmental issues more accessible and actionable (Iqbal et al., 2025).

Digital platforms thus function not only as channels for dissemination but also as spaces for the symbolic and affective performance of ecological identities. On social media in particular, environmental engagement frequently takes the form of value-based expressions where activism is embedded in narratives of collective responsibility, intersectionality, and affective connection to the more-than-human world (Hannouch & Milstein, 2024). However, digital visibility is not without ambivalence. High-profile environmental figures, such as Greta Thunberg, exemplify how social media can simultaneously facilitate large-scale mobilisation and provoke ideological opposition, reinforcing the contested nature of online environmental discourse (Mede & Schroeder, 2024). Furthermore, research suggests that digital media's influence on PEBs does not operate through a linear knowledge-to-action mechanism. In the case of green consumption, for example, behaviour is more strongly associated with ethical values and environmental responsibility than with factual or product-specific knowledge (Nazish et al., 2024). Green product knowledge appears to exert a minimal mediating effect on consumer intentions.

2.3 Technostress, digital dependence, and voluntary digital disconnection

While digital technology can facilitate nature connection and support environmental advocacy, its integration into environmentalism also raises concerns about its potential psychological impacts. Intensive digital device use has been linked to various psychological challenges, including technostress, problematic smartphone use, and internet addiction (Setia et al., 2025). These phenomena manifest through negative emotional and physiological responses such as anxiety, irritability, frustration, and fatigue. Driven in part by the “fear of missing out” (FOMO), these patterns contrast with the restorative effects associated with time in nature, reinforcing a perceived opposition between digital and nature-based experiences (Mercier et al., 2025). Digital tools can be double-edged swords in the context of environmental activism. Although they are instrumental in facilitating mobilisation, outreach, and environmental awareness, they also contribute to distraction, entertainment-driven engagement, and a disconnection from lived, place-based experience – all of which present significant challenges.

In response to the negative effects of excessive digital use, some individuals intentionally limit their device usage through voluntary digital disconnection. A recent, and still developing, line of research, voluntary digital disconnection is defined as “a deliberate form of non-use of devices, platforms, features, interactions and/or messages that varies in frequency and duration with the aim of restoring or improving one's perceived overuse, social interactions, psychological well-being, productivity, privacy and/or perceived usefulness” (Nassen et al., 2023, p. 1). This shift has prompted the rise of digital detox

interventions, including productivity apps, smartphone wellbeing tools, social media features encouraging breaks, and nature-focused digital detox retreats (Mirbabaie et al., 2022). This trend also reflects broader neoliberal logics, as disconnection becomes commodified through disconnective media that promote self-optimisation and well-being while reinforcing normative ideals of productivity, balance, and efficient use of time (Bozan & Treré, 2024).

3. Methods

3.1 Design

An explanatory sequential mixed methods design was chosen for this research. In the first phase, an online survey was realised to gather quantitative data and limited, supporting qualitative data. In the second phase, in-depth semi-structured interviews were conducted to provide additional qualitative data and elaborate on the quantitative findings. Data analysis included descriptive statistics and thematic analysis. This sequential approach enabled the quantitative data to identify broad patterns and relationships, while the qualitative data provided contextual understanding of these patterns. Data collection was conducted between February and October 2019 with the approval of James Cook University. Informed consent was obtained from all participants prior to the collection of survey data and the conduction of interviews.

3.2 Data collection

3.2.1 Participants

Two hundred twenty participants (118 Americans and 102 Australians) were purposefully recruited through ecovillages, urban farms, environmental organisations, community gardens, zero waste initiatives, and university departments in Australia and the United States, as well as via snowball sampling from the principal investigator's personal networks. Australia and the United States were chosen as case studies because both countries combine digital connectivity with diverse natural environments and active environmental advocates, making them relevant benchmarks for the international literature. The inclusion criteria aimed to ensure participants had an interest in environmental activism and were digital users. The mean age of participants was 44.83 and 70% were female. On average, they used the internet 3.49 hours per day, and 70.1% had websites, blogs, and/or social media pages promoting environmental awareness. As the study targeted environmentally conscious digital users, self-selection was an intentional and appropriate aspect of the design, though it may introduce bias towards pro-environmental views and limit generalisability. Self-reported data also pose risks of social desirability and recall bias; these limitations are addressed in the conclusion. Participants were invited by email to complete the online survey and, through the survey, they were invited to a follow-up interview. Out of the 114 participants (58 Americans and 56 Australians) who initially agreed to be interviewed during the survey, 20 were selected for follow-up interviews based on their availability when contacted.

3.2.2 Pilot study

A pilot study using a convenience sample of 10 James Cook University undergraduates and postgraduates was conducted to test the survey on a small, representative sample, and to allow adjustments to be made before full-scale implementation, ensuring the reliability and validity of the survey instrument.

3.2.3 Online survey

An online questionnaire of 29 items (22 closed questions, 7 open-ended questions, and 9 comment boxes) was designed to explore participants' views on nature and digital technology. The survey addressed constructs such as nature connection, emotional responses to environmental degradation, and the perceived impact of digital technology on human-nature relationships, examined both conceptually and experientially. It was divided into three sections: (1) sociodemographic details including age, birthplace,

gender, employment status, educational status, yearly income, and location (8 items), (2) views on nature including perceptions of wilderness, the psychological connection between humans and nature, perspectives on the inclusion of human-made objects in nature, and beliefs regarding human/nature dualism (12 items), and (3) views on digital technology including how participants engage with digital technology, their awareness of its potential impacts on wellbeing, and their perceptions of technology's role in facilitating or hindering their relationship with nature (6 items). The first and last two questions concerned consent, follow-up interviews, and incentives. Items were developed with reference to relevant theoretical frameworks as presented in the appendix – including solastalgia (Albrecht et al., 2007), nature connectedness (Mayer & Frantz, 2004), ecofeminism (Plumwood, 1993), digital detox (Syvertsen, 2020), etc. – but no standardised scales were used, in line with the exploratory nature of the study.

3.2.4 Semi-structured interviews

Semi-structured in-depth interviews were conducted to clarify and expand on the survey answers. The interview protocol included questions related to connection to nature, notions of home and wilderness, distress experienced when witnessing environmental degradation online, and the physical and psychological impact of online nature experiences and screen time. The interviews were realised in person, online via video calls, and through email. They were recorded and transcribed verbatim afterward when applicable.

3.3 Data validation

Although no standardised psychometric scales were used, survey instrument validity was addressed through consistency with established theoretical frameworks (see appendix) and refinement via a pilot study, which allowed review of internal coherence. Due to the exploratory nature of the survey and the use of adapted or single-item measures, reliability testing (e.g., Cronbach's alpha) and formal psychometric analyses such as discriminant validity were not applicable. Qualitative validity was ensured through triangulation across survey data, open-ended responses, and semi-structured interviews, strengthening interpretative validity. Qualitative data were analysed systematically using a hybrid inductive-deductive thematic analysis approach, with transparent coding procedures conducted in NVivo to provide an audit trail. The explanatory sequential mixed methods design strengthened overall construct and interpretive validity.

3.4 Data analysis

Quantitative and qualitative data were analysed using distinct but complementary procedures, with the quantitative data analysed first to identify key patterns and inform the development and focus of the subsequent qualitative analysis.

3.4.1 Quantitative strand

Descriptive statistics were used to analyse the 22 closed-ended survey questions, including Likert-scale, binary, and multiple-choice items. Percentages were calculated using Microsoft Excel to identify key trends and summarise response distributions. These results informed the design of the interview guide and helped identify themes for deeper qualitative investigation.

3.4.2 Qualitative strand

Qualitative data were derived from two sources: 1) 7 open-ended survey questions and 9 comment boxes distributed throughout the questionnaire, and 2) semi-structured interviews conducted with survey participants who volunteered for follow-up. Thematic analysis (Braun & Clarke, 2006) was applied to the combined qualitative dataset using a hybrid inductive and deductive approach. It provided a structured framework to identify and organise patterns of meaning (themes) across six phases: 1) familiarising with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) refining and naming

themes, and 6) writing the report. The qualitative dataset was managed electronically using NVivo (Version 12).

4. Results

4.1 Quantitative analysis

The quantitative results are presented below using descriptive statistics, primarily through graphs displaying percentages. A total of 220 questionnaires were initiated, with 160 being fully completed. Consequently, 60 questionnaires were excluded as they were either entirely blank or only had the demographic section filled out.

The three graphs below show that participants were daily digital users. The majority spent 2 to 5 hours on the internet per day, with 39.69% selecting this option. Only a few participants (5.04%) reported spending more than 8 hours online daily. Additionally, 53.37% of participants indicated that they checked their emails every day. Social media was also frequently accessed, with “often” being the most selected response (30.98%), followed closely by “sometimes” (30.92%). Notably, 16.59% of participants reported never using social media.

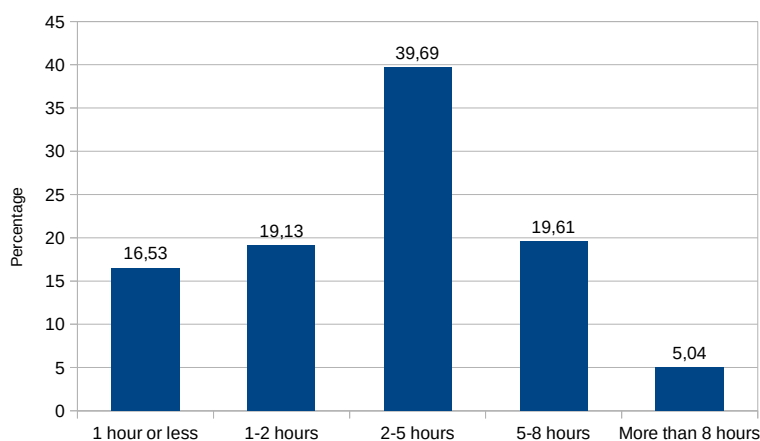


Figure 1. In a typical day how much time do you spend using the internet?

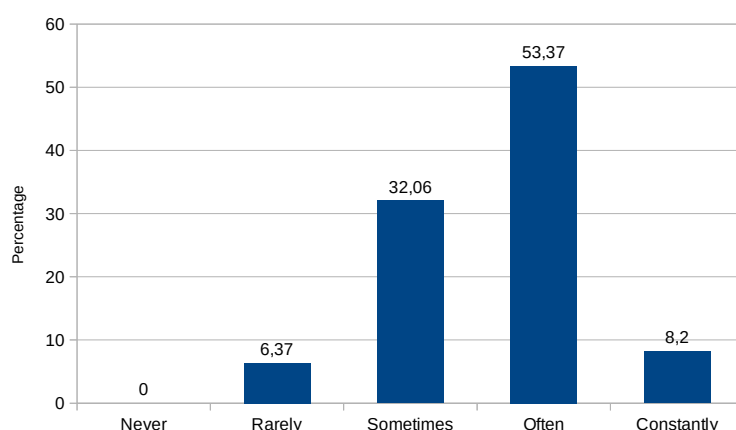


Figure 2. In a typical day how often do you check your emails?

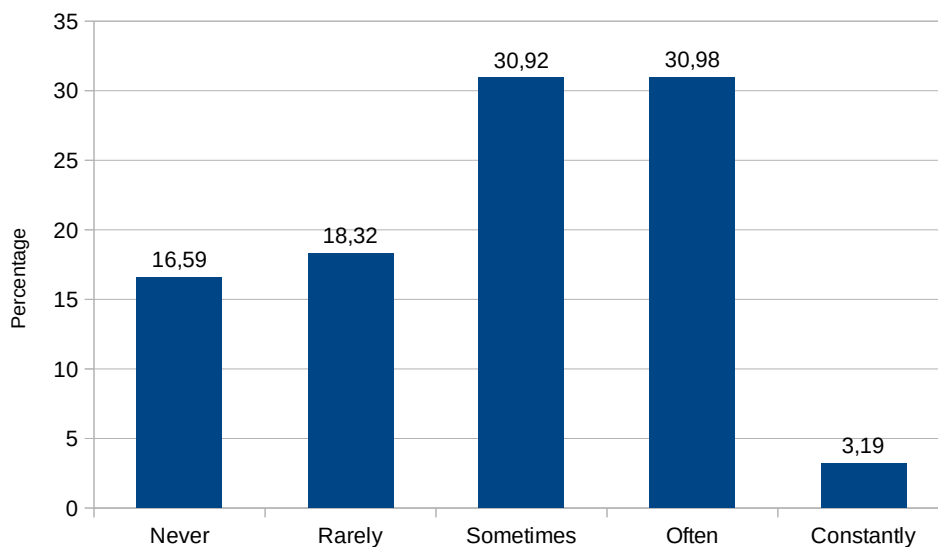


Figure 3. In a typical day how often do you check social media?

On average, most participants (54.52%) reported not experiencing feelings of powerlessness due to the increasing prevalence of digital technology in everyday life.

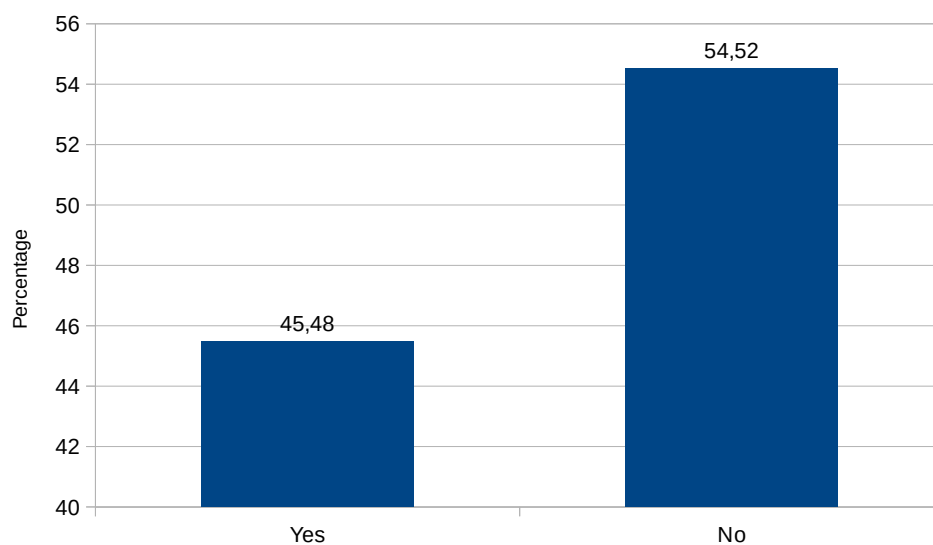


Figure 4. Do you experience feelings of powerlessness due to increasing prevalence of digital technology in everyday life?

As Figure 5 demonstrates, participants also reported periodically unplugging and intentionally engaging in digital detox, with 52.25% selecting this as the most frequent response.

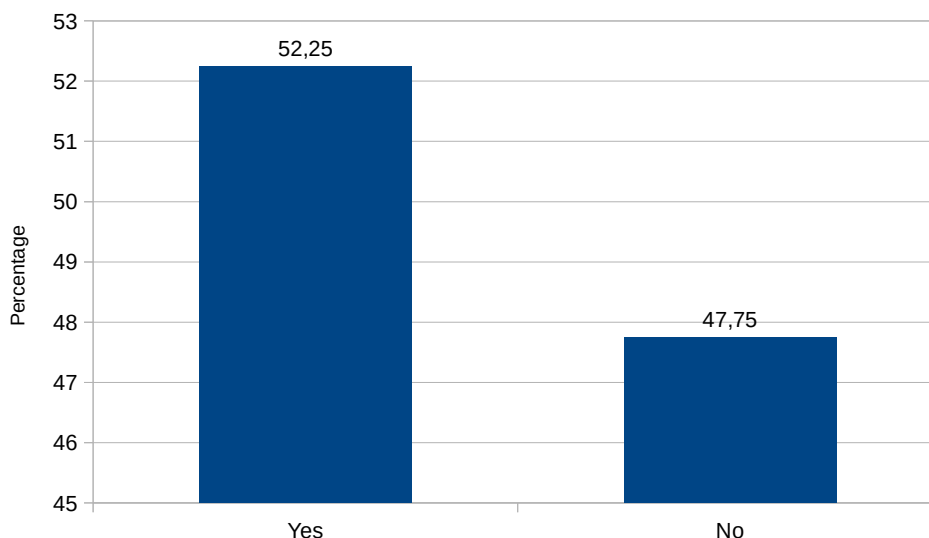


Figure 5. Do you periodically unplug or deliberately take a digital detox?

Figure 6 shows that most participants (54.23%) reported that digital technology neither helped nor hindered their relationship with nature. Interestingly, 33.46% indicated that it had positively influenced their relationship with nature, while the smallest group, 12.31%, mentioned that it had a detrimental effect.

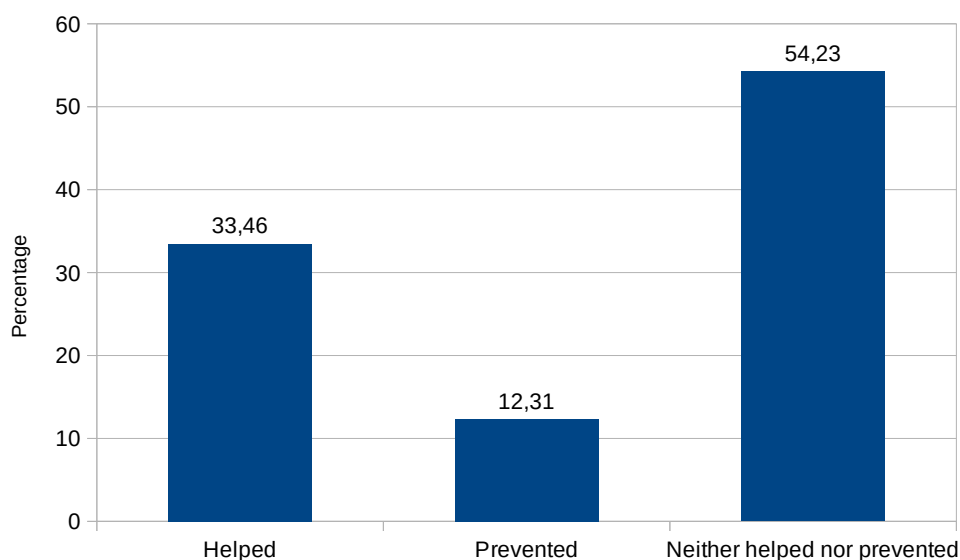


Figure 6. Has digital technology helped you to or prevented you from having a deeper relationship with nature?

A majority of participants (84.74%) indicated that their upbringing nurtured their relationship with nature, suggesting that their childhood experiences fostered a lasting connection to the natural world that persisted into adulthood.

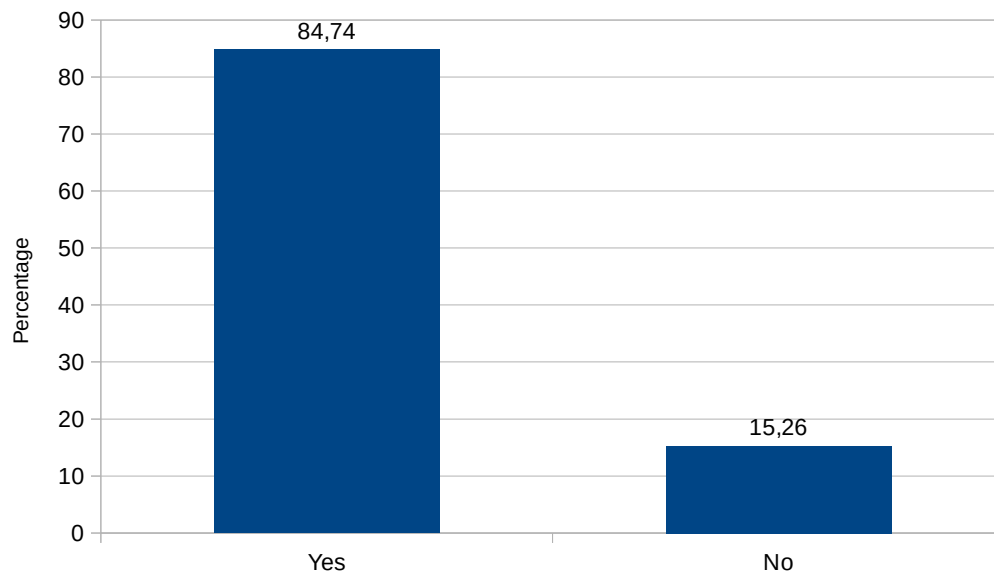


Figure 7. Has your upbringing helped you to nurture a relationship with nature?

Regarding their emotional engagement with nature, a vast majority of participants reported experiencing solastalgia (i.e. the distress caused by environmental change and a yearning for nature). For the 4.46% of participants who did not report experiencing solastalgia, the remaining 95.54% indicated having experienced it to varying degrees, from “a little” to “a great deal”. The most common response was “a great deal”, reported by 30.29% of participants.

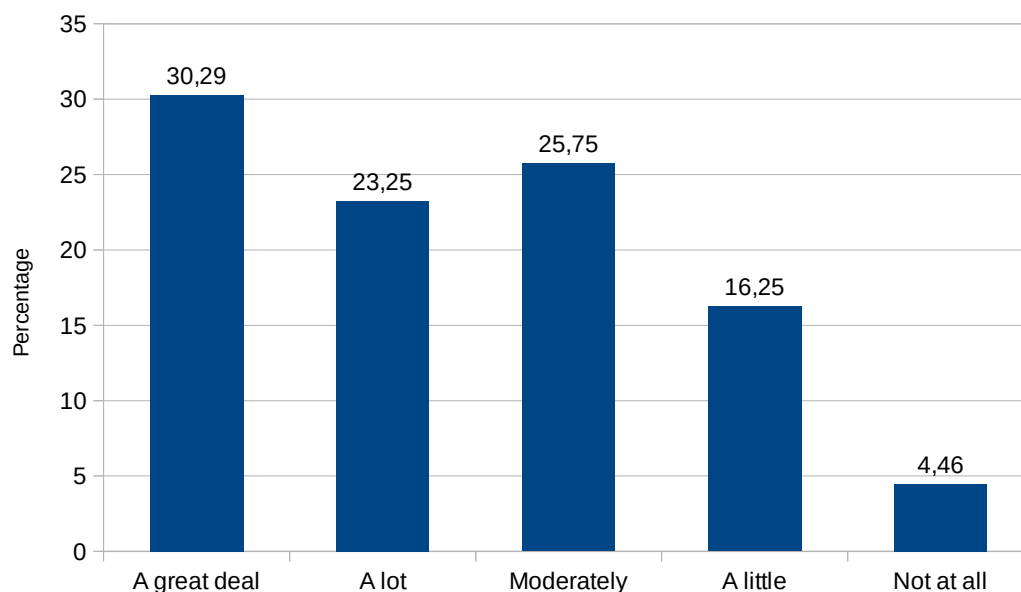


Figure 8. Have you ever experienced solastalgia?

The graph shows that most participants identified themselves as part of nature. Specifically, 84.66% reported feeling connected to nature, with responses ranging from “slightly” to “completely part of nature”. In contrast, only 15.34% viewed themselves as separate from nature. The most frequently selected response was “mostly part of nature”, chosen by 37.47% of participants.

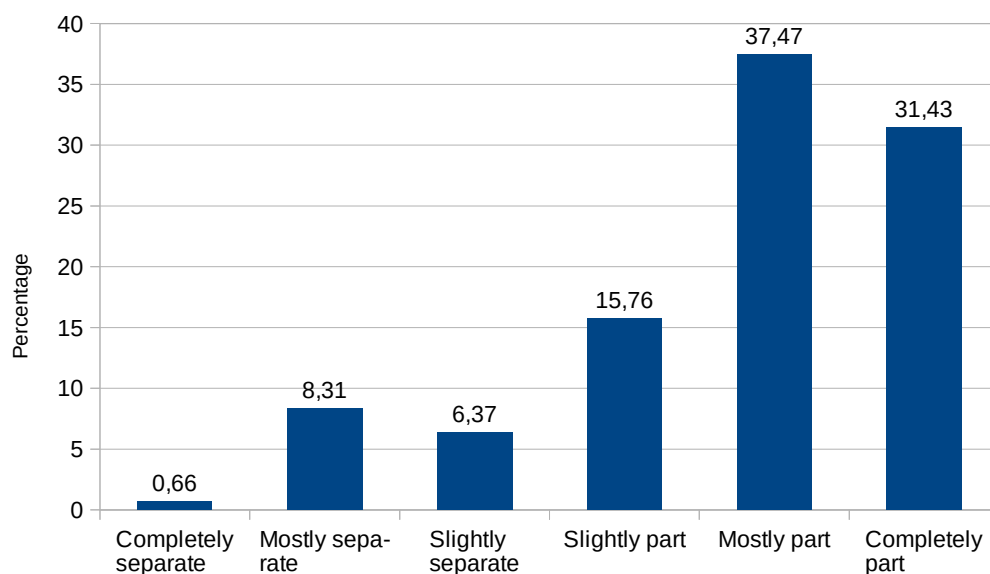


Figure 9. Do you see yourself as separate from or part of nature?

Human/nature dualism, a prevalent concept in Western society, posits that humans and nature are separate and distinct. However, most participants (64.46%) disagreed with this view and did not believe there was any truth to the concept.

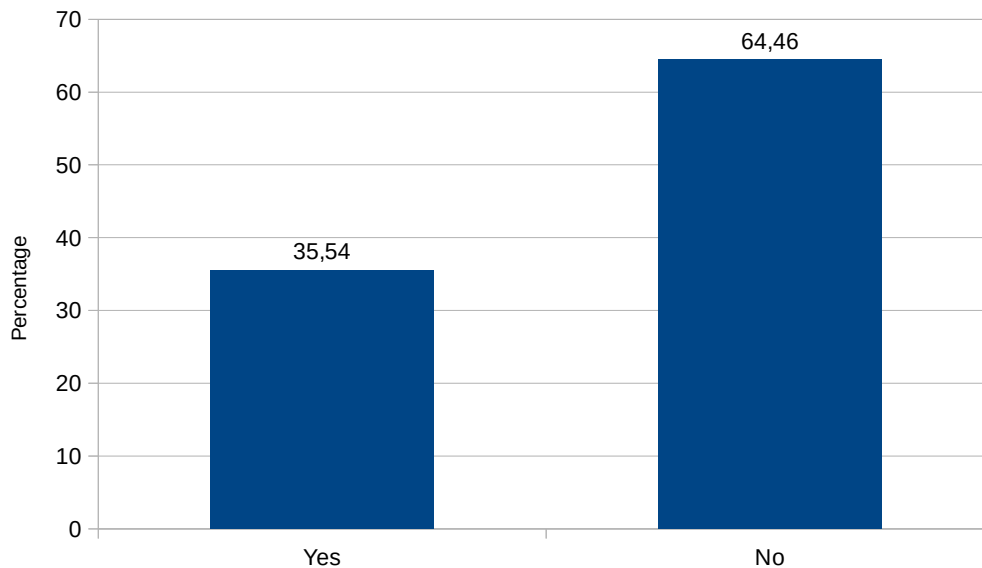


Figure 10. Do you think there is any truth to the concept of human/nature dualism?

According to the American Wilderness Act of 1964, wilderness is defined as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain”. Most participants (66.36%) supported this definition, including those who answered, “Strongly agree” or “Agree”. The most frequently chosen response was “Agree,” selected by 45.74% of participants. In contrast, “Strongly disagree” was the least common response, chosen by only 4.36% of participants.

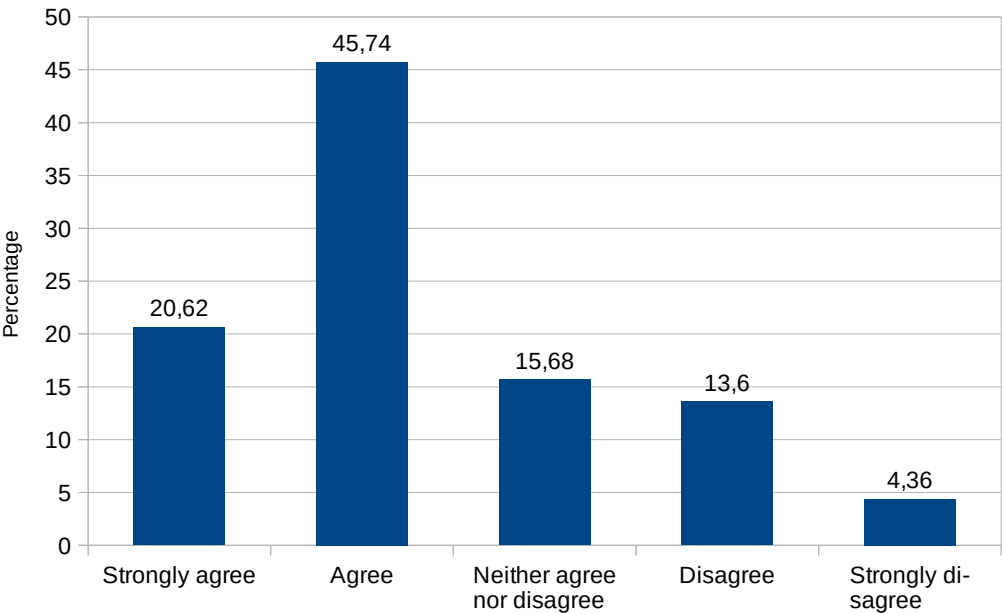


Figure 11. Do you agree or do you disagree with the definition of wilderness proposed by the American Wilderness Act?

Figure 12 shows that a majority of participants (78.75%) did not consider modern human objects, such as plastic, cars, smartphones, etc., to be part of nature.

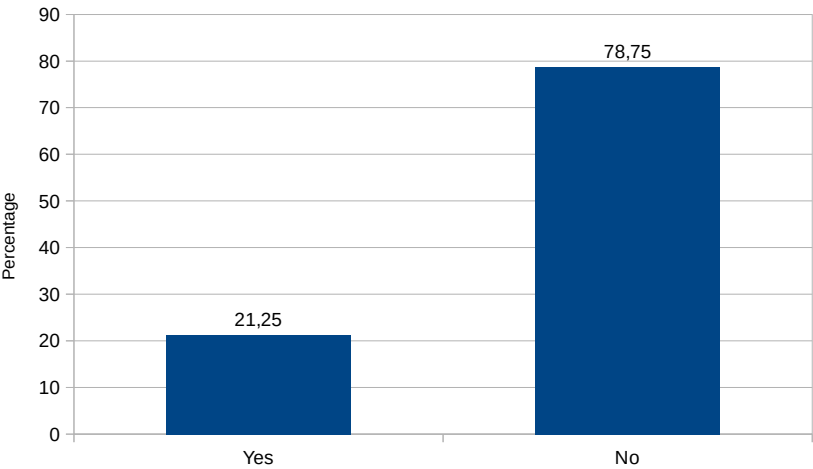


Figure 12. Do you consider humans' modern creations as being part of nature?

4.2 Qualitative analysis

A thematic analysis was conducted using a hybrid inductive and deductive approach and resulted in the identification of overarching themes. Six major themes were extracted from the combined survey and interview data, namely Connection to nature, Human-nature dichotomy, Environmental education, Ecological emotions, Digital limitations to nature engagement, and Voluntary digital disconnection.

4.2.1 *Connection to nature*

This theme explores how participants define their relationship with the environment, highlighting their sense of connection, responsibility, and identity derived from interactions with nature. Many participants viewed themselves as an integral part of nature, as Participant 98 expressed: “We are all nature. Nature is everything on this planet”. Others questioned the notion of separation from nature, with Participant 21 noting, “I find myself wondering how people are able to even for moment consider themselves being not a part of nature: like, you are currently converting a sandwich, which is made of other species, into your body!” Some participants also considered human objects as part of nature. As Participant 13 explained, “A beaver dam is part of nature. It’s the beaver’s habitat. Cities are human habitat. Humans are part of nature. Thus, cities are also nature”. While some acknowledged that human actions, even destructive ones, are natural, they also recognised the complexity of this viewpoint. Participant 45 reflected, “I think that all human actions are natural, but not that acting ‘naturally’ is necessarily just. Nature is not necessarily just or sustainable, especially if we (as I do) consider the human species to be part of the greater system of nature. No part of nature, human or otherwise, acts to preserve its own environment or the ecological stability of the world. Nature is not inherently permanent or self-sustaining”. Participants referred to their connection to nature as multidimensional, involving cognitive, emotional, and behavioural aspects. However, many experienced internal conflicts between their intellectual understanding and emotional responses. As Participant 7 expressed, “My intellectual attempt to see myself and human creations as part of nature is in direct conflict with my feelings and beliefs that modern creations and human culture are responsible for a lot of the environmental degradation currently happening”.

4.2.2 *Human-nature dichotomy*

This theme explores the perceived separation between humans and nature, where participants often viewed nature as an external entity distinct from human life and society. This perception does not contradict the theme of Connection to Nature but rather complements it, illustrating the complexities in participants’ conceptualisation of nature. Participants defined nature as “the world around us” (Participant 70), “that which exists outside of human activity” (Participant 65), “the part of the world that humans didn’t make up themselves” (Participant 39), or “a place that humans haven’t fucked up” (Participant 123). They shared an idealised view of pristine, untouched nature, depicting wilderness as distinct from human civilisation – a “green refuge, providing peace and tranquility from urban life” (Participant 7). Nature was perceived as more or less natural depending on “the levels of human impact and population” (Participant 72), and human presence was seen as inversely proportional to natural presence. Participant 159 elaborated on this idea: “I personally have a scale where I acknowledge things have varying degrees of human influence. For example, a garden is made up of ‘natural plants’ but the distribution of those plants is designed by humans, so a garden is ‘somewhat natural’. The wilderness is not designed by humans and is an assortment of naturally distributed plants, so it is ‘mostly natural’”. Participants also viewed modern lifestyles as detrimental to the environment, or “ecocidal”, as Participant 103 noted. Participant 113 argued that “Anything that negatively impacts the natural balance of our environment on a large scale is not part of nature”, meaning modern human societies.

4.2.3 *Environmental education*

Participants emphasised that environmental education played a role in developing their connection to nature. This education extended beyond formal settings, and was influenced by family, time spent in nature, media, and school. Nature exposure during childhood was particularly important in fostering a deep connection to the natural world in adulthood. Participant 103 recalled, “I grew up in a city and my mother introduced me to planting flowers and naming flowers when I was a young girl and I loved it. She told me I had a ‘green thumb’ when I said I liked the feeling of dirt on my hands. That small encouragement flourished into a love of gardening”. Similarly, Participant 82 shared, “Growing up, I had

opportunities to spend a fair amount of time in natural surroundings... I felt that nature was somewhere I could feel free and somewhere where I belonged". Participants also acknowledged the role of academic education and environment-related courses to promote environmental awareness. Traditional and digital media, including documentaries, films, and books, also influenced their education, often inspiring lifestyle changes. Specifically, the internet emerged as a modern tool, providing access to information and like-minded people that reinforced pro-environmental values. Participant 67 noted, "My recent, most radical sense of deep connection has been made possible through the internet – especially being able to find, read and hear people like Tim Morton, Val Plumwood, and others. These connections, I feel, have given me more access to connection with the landscapes and other species around me". Online activities were also praised for inspiring intention to engage with physical nature, with Participant 19 stating, "Social media helps me connect with others who are out in nature, sharing their experiences. This inspires and motivates me to get out there".

4.2.4 *Ecological emotions*

Participants often expressed emotions like guilt, anger, sadness, and anxiety, reinterpreted in the ecological crisis as eco-guilt, eco-grief, and solastalgia. Demonstrating the intensity of eco-guilt, Participant 151 described their view of humanity's environmental impact: "I despair that human beings are the most destructive, selfish, greedy species on Earth... When I'm feeling at my worst, I feel that we, humans, are a disease for the planet". Eco-grief, a response to environmental loss, and solastalgia, the distress caused by environmental change, were also common. Participants felt profound sadness and anxiety over ecological destruction, often sensing a personal loss. Participant 33 reflected, "I was in high school when I first had this feeling. I looked out the window and saw parking lots and ugly brick buildings. I wrote a poem about it. I just think it's so sad the way humans alter something so beautiful [as nature] and make it permanently bleak". This emotional turmoil was frequently accompanied by a deep longing for nature, a key aspect of solastalgia. Spending time indoors or in urban areas intensified these feelings, with participants reporting "a feeling similar to claustrophobia" (Participant 117), "a type of gagging reaction of the body" (Participant 93), or, as Participant 81 explained after spending prolonged time inside, "I found myself almost hurting to go outside and get away".

4.2.5 *Digital limitations to nature engagement*

Participants acknowledged that digital technology could limit their experience of nature. They criticised digital technology for being addictive, leading to increased indoor activity and reducing time spent outdoors. As Participant 110 explained, "Use of digital technology is very attractive in that it takes little effort, and it gives constant rewards for usage. It is so attractive that I spend a lot of time using it rather than doing things I used to do such as take nature walks". While some recognised the benefits of indirect digital interactions with nature, they generally found these experiences to be inferior to direct interactions. As Participant 149 explained, "I actually haven't watched a whole lot of environment-based things online. Most of what is experienced through the computer is fake". Participants described digital nature experiences as lacking and leading to a mind-body disconnect because digital technology does not provide a full sensory, physical experience, and is mostly cognitive: "Experiencing nature through the screen does not make me feel physically good, but it does have a positive mental effect for the time you are watching it" (Participant 120). They also agreed that constant connectivity resulted in exposure to distressing environmental news and digital solastalgia (i.e. the distress felt when experiencing environmental damage online). Participant 17 illustrated this: "I experience digital solastalgia almost on a daily basis when reading the news [with] global examples such as climate change. In comparison, I feel solastalgia far less often.... I feel that digital solastalgia is more distressing as I am more distant from the source and feel powerless to take action". Likewise, Participant 53 shared: "I more often, and at a more terrible scale, encounter global ecological disaster online than in my own community". This led some to consciously

limit their time on certain platforms, such as social media, to mitigate the impact. Participant 101 noted, “I have to limit my time on Twitter because of it”.

4.2.6 Voluntary digital disconnection

This theme refers to participants’ conscious engagement with digital technology. It captures their awareness of how digital tools impact their lives, the intentional choices they make regarding technology use, and their strategies for maintaining a balanced digital/nature time. Participants reported using the internet moderately and primarily for valued activities, balancing their digital consumption with social time, nature time, and knowledge expansion. Participant 19 noted, “I have consciously thought about what types of digital media I consume and made changes to my habits”. Many participants describe maintaining control over their technology use, deliberately engaging in digital disconnection. Participant 86 explained, “I check my emails almost exactly once per day, but sometimes I skip a day... I stop using technology after dark and instead turn to drawing or reading paper books”. Another shared not really having a routine but “... my brain tires of a computer quickly and I feel compelled to take breaks to exercise, read, play guitar, cook, or engage in something non-screen-related” (Participant 21). Similarly, Participant 50 stated, “I have control over the impact of digital technology in my life and can say no and walk away when I feel the need”. Balancing screen time with nature time is also common. As Participant 8 shared, “I make sure to sit silently in a garden or forest for at least one hour a day”. Others saw nature as a way to recover from online activities: “Often, if I’ve had to be in front of a screen for an excessive amount of time, I have a great desire to just go out and lie on the grass and look up at the branches of the nearest tree. Then I feel better” (Participant 32).

5. Discussion

The findings of this study show that digital technology primarily supports nature connection. More specifically, it is a neutral tool for positive change when used with intention. Participants described digital tools as facilitators of environmental learning and activism, community engagement, and nature exposure. They recognised the educational and social benefits afforded by the internet, including access to information and inspiration for nature-based practices. This corroborates existing research which shows that digital nature can support pro-environmental attitudes and intentions to engage with physical nature, particularly among younger individuals and urban populations (Sultana & Hawken, 2023). While 33.46% of participants perceived technology as a positive tool and 54.23% reported a neutral impact, only a small proportion (12.31%) felt that it hindered their relationship with nature. These results were further clarified in the qualitative analysis, which showed that digital technology can enhance nature connection when used with intentionality – that is, through participants’ deliberate efforts to manage their digital engagement in line with personal values and well-being. As participant 10 observed: “I pick and choose how I use technology, and how much I let it intrude”.

In response to concerns about overuse, many adopted disconnective practices such as digital detoxes, silent mode, screen time monitoring, and everyday limits like avoiding screens after 7 p.m. or refraining from phone use during meals. Participants reported lower-than-average daily internet use (2-5 hours),¹ and their motivations for disconnection included psychological health and the desire to prioritise offline activities – particularly nature-based activities such as gardening, hiking, camping, and surfing. This aligns with research showing that voluntary disconnection is a response to pervasive connectivity and that individuals increasingly manage digital use by selectively moderating perceived detrimental aspects (Nassen et al., 2023; Radtke et al., 2022). Such practices are also reflective of a broader orientation toward digital wellbeing, often closely intertwined with acts of disconnection (Vanden Abeele & Nguyen, 2022). In this study, 52.25% of participants reported intentionally limiting digital use, while a comparable proportion (54.52%) indicated they did not feel overwhelmed by digital technologies – suggesting a degree of success in maintaining boundaries.

However, such accounts require contextualisation. While participants reported autonomous strategies to limit digital consumption and support nature engagement, these behaviours are embedded in broader structural and systemic conditions. Urbanisation, socioeconomic disparities, and restricted access to natural environments can significantly constrain opportunities for nature interaction, regardless of individual intent (Colley et al., 2022). Moreover, the capacity to enact intentional disconnection is unequally distributed, as digital access and literacy remain shaped by sociodemographic inequalities that limit how marginalised groups can engage in empowering digital practices (Ragnedda et al., 2022). These dynamics are consistent with research in environmental justice and political ecology, which emphasise how digital mediations of human-nonhuman relations are shaped by material infrastructures and conditioned by broader structural inequities (Turnbull et al., 2022). As Sultana (2022) argues, the colonality of climate change shapes people's lived experiences through global racial capitalism and historical disposessions, underscoring how opportunities for environmental engagement are unevenly distributed. Digital engagement with nature should therefore be understood not solely as expressions of personal preference, but as practices influenced by complex social, economic, and political forces.

At the same time, participants demonstrated awareness of not just how much time they spent online, but also what kinds of digital content they engaged with. This included making conscious choices about social media use and the types of news they consumed, particularly in relation to environmental issues. Several participants expressed concern about the emotional toll of repeated exposure to distressing environmental news – an increasingly documented phenomenon (Pearson, 2024). Given that approximately 80% of international media coverage on climate change has been classified as negative (Vattenfall, 2020), such responses are not unexpected. For many, limiting digital engagement – particularly with climate-related content – served as a protective strategy, though somewhat ineffective (Chapman & Peters, 2024). As participant 90 explained, the environmental crisis “can be beamed into your world every day, multiple times a day, along with the human distress it causes”. These emotional responses reveal not only the psychological cost of digital exposure to the environmental crisis but also point to the emergence of new emotional states unique to the digital sphere.

In this respect, a particularly novel finding of this study is the construct of digital solastalgia – the emotional distress experienced through witnessing environmental degradation online (Martin, 2024). This concept extends Albrecht's (2019) notion of solastalgia to cyberspace and digital nature experiences, capturing a new dimension of environmental distress linked to global, remote environments. The emotional dimensions of solastalgia and digital solastalgia were portrayed by participant 101 as notably different: “I experience digital solastalgia all the time – I have to limit my time on Twitter because of it. The digital solastalgia is ore of grim all-encompassing doom feeling, while the local solastalgia is more of a powerless franticness – like I can't stop all the lawnmowers and building construction, but it drives me out of my brain to have to see and hear it”. These findings show how participants manage digital solastalgia through selective avoidance of environmental news and social media. This coping strategy, while protective, also exposes the emotional limits of digital environmentalism in sustaining education, mobilisation, and engagement – revealing its potential to contribute to eco-paralysis (Innocenti et al., 2023) and raising broader concerns about its overall effectiveness.

The persistence of a culturally embedded human-nature dualism, even among environmentally conscious individuals, further nuances these findings, reflecting enduring Western conceptualisations that separate humans and nature. While 84.66% of participants saw themselves as part of nature, 66.36% defined wilderness as devoid of human presence, and 78.75% perceived human-made creations as separate from nature. This dissonance suggests that deeply rooted social and cultural norms continue to shape conceptualisations of nature, reinforcing a dualistic perspective. This confirms but also extends prior literature on nature connection by emphasising the simultaneous presence of inclusionary and exclusionary understandings of nature among the same individuals (Hastings & Sæther, 2024). Specifically, human-nature separation was apparent in the participants' conceptualisation of human-made objects. Items such as clothing, cars, and digital devices have traditionally been considered symbols of

urbanisation and industrialisation, often perceived as artificial and distancing humans from the natural world. However, recent research aimed at reconciling nature and culture shows that conscious interactions with everyday objects – including digital devices – involving care and learning were significantly associated with nature connectedness, PEBs, and life satisfaction (Kamide & Arai, 2024). Interactions with domestic artefacts are not isolated experiences but are related to broader awareness of and behaviour toward the natural world, with the home acting as the first ‘environment’.

The study’s findings raise ongoing debates and questions concerning the depth and impact of digital environmentalism. Digital platforms should ideally be used as a mutually reinforcing process between online and offline activism (Vancsó & Kovács-Magosi, 2024). Scholars debate whether digital environmentalism drives meaningful behavioural change or primarily encourages low-effort, passive participation (e.g., slacktivism, clicktivism) that may not translate into sustained offline activism or policy influence (Saikia & Hazarika, 2024). Additionally, digital activism is vulnerable to misinformation, emphasising the imperative to uphold accuracy and credibility. Research shows that the framing of environmental issues – particularly through affective components, whether positive or fear-based – is strongly linked to public engagement, as reflected in metrics such as likes, shares, and comments (Hart et al., 2024). Emotional resonance often outweighs factual content in driving digital interaction with environmental topics. Another question is the considerable ecological footprint of digital consumption, which can paradoxically undermine the very goals of environmental advocacy (Istrate et al., 2024).

6. Conclusion

6.1 Theoretical implications

This study contributes to the literature by offering several theoretical insights. First, it reconceptualises digital devices as potential mediators – rather than obstacles – of human-nature relationships. Second, it identifies voluntary digital disconnection as a nature-connecting strategy used by environmentally conscious individuals to cultivate presence and sensory immersion in natural environments. Third, the study introduces the notion of digital solastalgia to describe the emotional distress triggered not by physical environmental degradation, but by digital representations of environmental damage. Fourth, it acknowledges the persistence of a human-nature dualism, even among environmentally conscious individuals, revealing the cultural depth of nature separation in contemporary digital societies. Collectively, these findings challenge binary framings of nature engagement as either online or offline, suggesting instead a more fluid and hybridised understanding of nature experiences in the digital age.

6.2 Practical contributions

This study offers actionable insights for environmental educators, communicators, mental health practitioners, and digital designers. By recognising the emotional and identity-based dimensions of digital engagement with nature, it advocates for hybrid interventions that integrate digital and embodied experiences – such as apps promoting sensory immersion or storytelling platforms that encourage outdoor activity. The concept of digital solastalgia provides a novel framework for addressing affective responses to virtual ecological degradation, with applications in ecotherapy and climate psychology. Finally, understanding voluntary disconnection as a regenerative practice invites more nuanced strategies for digital wellbeing – shifting from abstinence models to intentional, cyclical disconnection. These findings inform the development of digital tools and practices to support environmental awareness, and connection.

6.3 Limitations and future research

Nonetheless, the study is circumscribed by notable limitations. The participant pool predominantly comprised individuals who self-identified as environmentally conscious, generating an inherent selection bias that privileges pro-environmental narratives and practices. Consequently, voices characterised by scepticism, alienation, or indifference toward environmental issues remain marginal or absent, constraining the generalisability of the findings. Moreover, the reliance on self-reported data introduces the possibility of performative responses shaped by social desirability, notwithstanding measures to preserve anonymity. This study did not engage with Indigenous worldviews, which constitutes a significant epistemological and ethical limitation. Indigenous ontologies in both Australian and North American contexts frequently resist nature-culture dichotomies, offering holistic understandings of place, kinship, and more-than-human relations that were largely absent from participant narratives. Future research should aim to focus on Indigenous communities to examine how digital technology intersect with land-based knowledge systems and collective environmental responsibilities. Future research should also aim to investigate individuals with low nature affinity, or who use technology as their primary means of engaging with the world. Such perspectives would contribute to a more nuanced understanding of the plural and sometimes contradictory ways in which human-nature-technology connections are experienced.

Funding statement

This work was funded by James Cook University and the College of Arts, Society, and Education.

References

- Albrecht, G. (2019). *Earth emotions: New words for a new world*. Cornell University Press.
- Albrecht, G., Sartore, G. M., Connor, L., Higginbotham, N., Freeman, S., Kelly, B., Stain, H., Tonna, A., & Pollard, G. (2007). Solastalgia: The distress caused by environmental change. *Australasian psychiatry: Bulletin of Royal Australian and New Zealand College of Psychiatrists*, 15 Suppl 1, S95-S98. <https://doi.org/10.1080/10398560701701288>
- Alves, F., & Vidal, D. G. (2024). Plural nature(s): An overview of their sociocultural construction. *Encyclopedia*, 4(1), 1-12. <https://doi.org/10.3390/encyclopedia4010001>
- Boulangeat, I., Allain, S., Crouzat, E., Girard, S., Granjou, C., Poirier, C., Ruault, J. F., Paillet, Y., & Arpin, I. (2022). From human-nature dualism towards more integration in socio-ecosystems studies. In I. Misiune, D. Depellegrin & L. Egarter Vigl (eds), *Human-nature interactions* (pp. 37-49). Springer. https://doi.org/10.1007/978-3-031-01980-7_4
- Brambilla, E., Petersen, E., Stendal, K., Sundling, V., MacIntyre, T. E., & Calogiuri, G. (2022). Effects of immersive virtual nature on nature connectedness: A systematic review protocol. *Digital Health*, 8, Article 20552076221120324. <https://doi.org/10.1177/20552076221120324>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Chapman, D. A., & Peters, E. (2024). Examining the (non-linear) relationships between climate change anxiety, information seeking, and pro-environmental behavioral intentions. *Journal of Environmental Psychology*, 99, Article 102440. <https://doi.org/10.1016/j.jenvp.2024.102440>
- Christens, B. D., McCormick, M. L., & Wolf, J. (2025). Understanding and promoting nature connectedness: A human ecological perspective. *Current Opinion in Psychology*, 65, Article 102046. <https://doi.org/10.1016/j.copsyc.2025.102046>
- Clayton, S., Czellar, S., Nartova-Bochaver, S., Skibins, J. C., Salazar, G., Tseng, Y.-C., Irkhin, B., & Monge-Rodriguez, F. S. (2021). Cross-cultural validation of a revised environmental identity scale. *Sustainability*, 13(4), Article 2387. <https://doi.org/10.3390/su13042387>
- Colley, K., Irvine, K. N., & Currie, M. (2022). Who benefits from nature? A quantitative intersectional perspective on inequalities in contact with nature and the gender gap outdoors. *Landscape and Urban Planning*, 223, Article 104420. <https://doi.org/10.1016/j.landurbplan.2022.104420>
- Cuadrado, E., Macias-Zambrano, L., J. Carpio, A., & Tabernero, C. (2022). The ABC connectedness to nature scale: development and validation of a scale with an approach to affective, behavioural, and cognitive aspects. *Environmental Education Research*, 29(2), 308-329. <https://doi.org/10.1080/13504622.2022.2111407>

- Descola, P. (2013). *Beyond nature and culture*. University of Chicago Press.
- Guazzini, A., Valdrighi, G., Fiorenza, M., & Duradoni, M. (2025). The relationship between connectedness to nature and pro-environmental behaviors: A systematic review. *Sustainability*, 17(8), Article 3686. <https://doi.org/10.3390/su17083686>
- Hajj-Hassan, M., Chaker, R., & Cederqvist, A-M. (2024) Environmental education: A systematic review on the use of digital tools for fostering sustainability awareness. *Sustainability*, 16(9), Article 3733. <https://doi.org/10.3390/su16093733>
- Hannouch, B., & Milstein, T. (2024). Activating ecocentrism: How young women environmental activists produce identity on Instagram. *Environmental Communication*, 19(2), 198-217. <https://doi.org/10.1080/17524032.2024.2376697>
- Hart, P. S., Feldman, L., Choi, S., Chinn, S., & Hiaeshutter-Rice, D. (2024). Climate change advocacy and engagement on social media. *Science Communication*, 47(3), 385-412. <https://doi.org/10.1177/10755470241284934>
- Hastings, T. J., & Sæther, K. W. (eds.). (2024). *Views of nature and dualism: Rethinking philosophical, theological, and religious assumptions in the anthropocene*. Springer Nature.
- Iqbal, N., Arif, M., Abbas, Q., Mahmood, Q., Anwar, M. N., & Mansoor, M. (2025). Green influencers: The power of social media in shaping eco-conscious communities. *Advance Social Science Archive Journal*, 3(2), 402-412. DOI: <http://dx.doi.org/10.55966/assaj.2025.3.2.001>
- Innocenti, M., Perilli, A., Santarelli, G., Carluccio, N., Zjalic, D., Acquadro Maran, D., Ciabini, L., & Cadeddu, C. (2023). How does climate change worry influence the relationship between climate change anxiety and eco-paralysis? A moderation study. *Climate*, 11(9), Article 190. <https://doi.org/10.3390/cli11090190>
- Istrate, R., Tulus, V., Grass, R. N., Vanbever, L., Stark, W. J., & Guillen-Gosalbez, G. (2024). The environmental sustainability of digital content consumption. *Nature Communications*, 15, Article 3724. <https://doi.org/10.1038/s41467-024-47621-w>
- Kamide, H., & Arai, T. (2024). Human-object interaction, connectedness with nature, and life satisfaction: A cross-sectional study. *Frontiers in psychology*, 15, Article 1360518. <https://doi.org/10.3389/fpsyg.2024.1360518>
- Lam, J., Qiu, L., Xie, T., Lou, C., & Chan, S. H. M. (2025). Planting trees in the metaverse changes self-identity and improves pro-environmental interests and attitudes towards the physical world. *Virtual Reality*, 29(2), 1-15. <https://doi.org/10.1007/s10055-025-01137-w>
- Martin, M. (2024). Digital blues: Sense of self and the human-nature-technology connection in Australian aquatic environments. In M. Newlands & C. Hansen (eds), *Critical approaches to the Australian Blue Humanities* (pp. 123-133). Routledge. <https://doi.org/10.4324/9781003365501-13>
- Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, 24(4), 503-515. <https://doi.org/10.1016/j.jenvp.2004.10.001>
- Mede, N. G., & Schroeder, R. (2024). The "Greta effect" on social media: A systematic review of research on Thunberg's impact on digital climate change communication. *Environmental Communication*, 18(6), 801-818. <https://doi.org/10.1080/17524032.2024.2314028>
- Meng, Y., Chung, D., & Zhang, A. (2023). The effect of social media environmental information exposure on the intention to participate in pro-environmental behavior. *PloS one*, 18(11), Article e0294577. <https://doi.org/10.1371/journal.pone.0294577>
- Mercier, J., Ertz, O., & Bocher, E. (2025). "Look at the trees": A verbal nudge to reduce screen time when learning biodiversity with augmented reality. *Computers in Human Behavior Reports*, 18(12), Article 100614. <https://doi.org/10.1016/j.chbr.2025.100614>
- Michaelson, V., King, N., Janssen, I., Lawal, S., & Pickett, W. (2020). Electronic screen technology use and connection to nature in Canadian adolescents: A mixed methods study. *Canadian Journal of Public Health*, 111(4), 502-514. <https://doi.org/10.17269/s41997-019-00289-y>
- Nassen, L.-M., Vandebosch, H., Poels, K., Karsay, K. (2023). Opt-out, abstain, unplug. A systematic review of the voluntary digital disconnection literature. *Telematics and Informatics*, 81, Article 101980. <https://doi.org/10.1016/j.tele.2023.101980>
- Nazish, M., Khan, M. N., & Khan, Z. (2024). Environmental sustainability in the digital age: unraveling the effect of social media on green purchase intention. *Young Consumers*, 25(6), 1015-1035. <https://doi.org/10.1108/YC-01-2024-1965>
- Pearson, H. (2024). The rise of eco-anxiety: scientists wake up to the mental-health toll of climate change. *Nature*, 628(8007), 256-258. <https://doi.org/10.1038/d41586-024-00998-6>
- Plumwood, V. (1993). *Feminism and the mastery of nature*. Routledge.
- Radtke, T., Apel, T., Schenkel, K., Keller, J., & von Lindern, E. (2022). Digital detox: An effective solution in the smartphone era? A systematic literature review. *Mobile Media & Communication*, 10(2), 190-215. <https://doi.org/10.1177/20501579211028647>
- Ragnedda, M., Ruiui, M. L., & Addeo, F. (2022). The self-reinforcing effect of digital and social exclusion: The inequality loop. *Telematics and Informatics*, 72, Article 101852. <https://doi.org/10.1016/j.tele.2022.101852>
- Reed, J. (2024). Postdigital nature connection. *Postdigital Science and Education*. <https://doi.org/10.1007/s42438-024-00528-7>
- Reese, G., Stahlberg, J., & Menzel, C. (2022). Digital shinrin-yoku: Do nature experiences in virtual reality reduce stress and increase well-being as strongly as similar experiences in a physical forest?. *Virtual Reality*, 26(3), 1245-1255. <https://doi.org/10.1007/s10055-022-00631-9>

- Rosa, C. D., Profice, C. C., & Collado, S. (2018). Nature experiences and adults' self-reported pro-environmental behaviors: The role of connectedness to nature and childhood nature experiences. *Frontiers in Psychology*, 9, Article 1055. <https://doi.org/10.3389/fpsyg.2018.01055>
- Saikia, P. P., & Hazarika, S. (2024). Construction of environmental activism in the digital age: Challenges and opportunities. In P. Singh, B. Ao, D. Medhavi (eds), *Environmental activism and global media* (pp. 157-182). Springer. https://doi.org/10.1007/978-3-031-55408-7_8
- Setia, S., Gilbert, F., Tichy, M. L., Redpath, J., Shahzad, N., & Marraccini, M. E. (2025). Digital detox strategies and mental health: A comprehensive scoping review of why, where, and how. *Cureus*, 17(1), Article e78250. DOI 10.7759/cureus.78250
- Shivanna, K. R. (2022). Climate change and its impact on biodiversity and human welfare. *Proceedings of the Indian National Science Academy. Part A, Physical Sciences*, 88(2), 160-171. <https://doi.org/10.1007/s43538-022-00073-6>
- Sultana, F. (2022). The unbearable heaviness of climate coloniality. *Political Geography*, 99, Article 102638. <https://doi.org/10.1016/j.polgeo.2022.102638>
- Sultana, R., & Hawken, S. (2023). Reconciling nature-technology-child connections: Smart cities and the necessity of a new paradigm of nature-sensitive technologies for today's children. *Sustainability*, 15(8), Article 6453. <https://doi.org/10.3390/su15086453>
- Thomas, V., Azmitia, M., & Whittaker, S. (2016). Unplugged: Exploring the costs and benefits of constant connection. *Computers in Human Behavior*, 63, 540-548. <https://doi.org/10.1016/j.chb.2016.05.078>
- Turnbull, J., Searle, A., Hartman Davies, O., Dodsworth, J., Chasseray-Peraldi, P., von Essen, E., & Anderson-Elliott, H. (2022). Digital ecologies: Materialities, encounters, governance. *Progress in Environmental Geography*, 2(1-2), 3-32. <https://doi.org/10.1177/27539687221145698>
- Vancsó, A., & Kovács-Magosi, O. (2024). The mutually reinforcing power of online and offline activism: The case of the Hungarian Fridays for Future movement. *Global Studies of Childhood*, 14(4), 412-432. <https://doi.org/10.1177/20436106241286523>
- Vanden Abeele, M. M. P., & Nguyen, M. H. (2022). Digital well-being in an age of mobile connectivity: An introduction to the Special Issue. *Mobile Media & Communication*, 10(2), 174-189. <https://doi.org/10.1177/20501579221080899>
- Vattenfall. (2020). The conversation on climate change and its impact on human behaviour. https://group.vattenfall.com/siteassets/corporate/what_we_do/report/climate_change_report_.pdf
- Wamsler, C., Osberg, G., Osika, W., Herndersson, H., & Mundaca, L. (2021). Linking internal and external transformation for sustainability and climate action: Towards a new research and policy agenda. *Global Environmental Change*, 71(1), Article 102373. <https://doi.org/10.1016/j.gloenvcha.2021.102373>

Appendix

Table 1. Survey questions, constructs, and theoretical bases

Construct	Survey question	Response format	Theoretical basis
Wilderness	According to the American Wilderness Act of 1964, wilderness is defined as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” Do you agree or do you disagree with this definition?	5-point Likert + comment	American Wilderness Act (1964)
Nature	Can you give your own definition of “nature”?	Open-ended	Author-designed
Childhood nature experience	Has your upbringing helped you to nurture a relationship with nature?	Yes/No + comment	Rosa et al. (2018)

Solastalgia	Solastalgia describes the distress people experience when a home and its landscapes are negatively impacted (by urban transformation, pollution, road works, tree cutting, etc.). It also describes a yearning for nature, common to Western societies, as screen time is winning over green time. Have you ever experienced solastalgia?	5-point Likert + open comment	Albrecht et al. (2007)
Nature connection	Do you see yourself as being separate from nature or as being part of nature?	6-point Likert	Mayer & Frantz (2004)
Human-nature dualism	Do you consider humans' modern creations (e.g. plastic, electricity, cars, smartphones, etc.) as being part of nature?	Yes/no + comment	Author-designed
Nature	How do you distinguish between nature, wilderness, and the bush?	Open-ended	Author-designed
Ecofeminism	Ecofeminism is a movement that sees parallels between the oppression of nature and the oppression of women. These parallels include, but are not limited to, seeing women and nature as property, and acknowledging that men dominate women, and humans dominate nature. Do you see yourself as an ecofeminist?	Yes/no	Plumwood (1993)
Self-identification	Do you consider yourself... (activist, ecologist, etc.)?	Multiple choice	Author-designed
Human-nature dualism	The human/nature dualism is a prevalent concept in Western society that describes human and nature as being separate and distinct. For instance, we often believe that city and nature are opposite, or that humans are superior to plants. Do you think there is any truth to the concept of human/nature dualism?	Yes/no + comment	Descola (2013)

Digital disconnection	Do you periodically unplug and deliberately take a digital detox (for example, no digital technology after 7pm, no connection at all on Sundays, etc.)?	Yes/no + comment	Thomas et al. (2016)
Digital overwhelm	Do you experience feelings of powerlessness due to the increasing prevalence of digital technology in everyday life?	Yes/no	Author-designed
Digital nature connection	Many researchers think that technology is changing our relationship with nature. In your experience, has digital technology helped you to have a deeper relationship with nature, or has it prevented you from having a deeper relationship with nature?	Multiple choice + comment	Author-designed