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Exploring the Rise of Eco/Green Psychology Concepts in Understanding Sustainable Action †

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† This paper is an extended version of our paper published in Moscardo, G.; Pearce, P. Eco-fatigue and its potential impact on sustainable tourist experiences. In Proceedings BEST EN Think Tank XIX, 30 June–3 July 2019, San Francisco, CA, USA.

Abstract: Psychology is a core discipline in understanding why and how individuals choose to engage in sustainable action. This paper uses social representations theory to explore the rising use of eco/green prefixes for psychology concepts through a critical analysis of the concept of eco/green fatigue. It argues that this term, which originated in the world of popular online news media, has typically been treated in academic psychology discussions using existing psychology concepts in the same way as eco-anxiety and eco-grief, which hides important features of the phenomenon that need to be better understood. The paper presents an analysis of eco-fatigue based on a critical review of the existing psychology literature, qualitative online archival analyses, and an exploratory quantitative survey study. The survey study was conducted with a sample of 182 students and non-students and analysed using principal components and cluster analysis. The paper provides evidence that simply adding an eco/green prefix to an existing psychology concept without a systematic empirical investigation into the phenomenon can result in overly simplistic conceptual frameworks that do not lead to sound practical conclusions. A preliminary empirical examination of the social representation of eco-fatigue in the public arena suggested that inappropriate sustainability messaging and bad business behaviour may be more of a barrier to sustainability action than the beliefs or attitudes held by individuals.

Keywords: eco/green psychology concepts; eco-fatigue; green fatigue; sustainability communication; sustainable action; social representations theory

Academic Editor: Tai-Yi Yu

Received: 21 March 2025
Revised: 30 April 2025
Accepted: 8 May 2025
Published: 12 May 2025

Citation: Pearce, J.; Moscardo, G. Exploring the Rise of Eco/Green Psychology Concepts in Understanding Sustainable Action. *Sustainability* **2025**, *17*, 4373. https://doi.org/10.3390/su17104373

1. Introduction

In 2007, the marketing firm TrendWatching [1] introduced "eco-fatigue" as part of a set of predicted marketing trends to describe decreasing consumer interest in, or avoidance of, eco-labelled products. This term, eco-fatigue, echoed the use of an eco- or green prefixes in front of other labels to describe psychological phenomena. This has become increasingly noticeable in public discussion of sustainability. It is also evident in the academic psychology literature, which has coined a plethora of labels such as green anxiety, eco-grief, eco-guilt, and eco-fatigue [2]. In some cases—for example, green or eco-anxiety—the existing psychology concept has been linked to sustainability issues with little or no change in its theoretical background or application [3]. However, in others, notably green or eco-fatigue, there is confusion over whether this is a new phenomenon or an existing psychology concept that needs to be adapted and changed to suit this new sustainability context [4]. Eco-fatigue appears in both online public discussions of sustainable action

and has appeared in academic papers, although without any clear definition or attempt at operationalisation or measurement. This confusion has important practical implications for those in sustainability communication. Educators and campaign developers rely on clear definitions to guide public strategies. Different psychological explanations lead to different recommendations for sustainability policies and communication efforts. In this paper, sustainability action refers to deliberate individual choices aimed at reducing environmental impact and promoting social equity. This includes modifying daily habits like conserving energy, reducing waste, and using sustainable transportation. It also includes participating in community initiatives and policy advocacy [5].This paper uses social representations theory (SRT) to explore this rise in the use of eco/green prefixes for psychology concepts through a critical analysis of the concept of eco/green fatigue. Social representations theory (SRT), developed by social psychologist Serge Moscovici, seeks to explain how people collectively construct and share knowledge about social phenomena. Social representations are systems of values, ideas, and practices that enable individuals to interpret and communicate their social reality [6]. They help transform abstract concepts into familiar and understandable forms, shaping public discourse and influencing social behaviour [7]. SRT was specifically developed to both understand the interaction between individual and social/collective approaches to key issues and explore how these interactions may differ between groups, especially the scientific community and the general public [8].

The overall aim of the study reported in this paper was to explore the concept of eco-fatigue, the social representation of it in the public domain, and how this might influence reported sustainability action. To address this overall aim, two more specific research objectives were developed. The first was to explore and describe social representations of the concept of eco-fatigue. This includes determining whether it exists as a phenomenon beyond concepts already used in psychology and, if so, what connections it has to sustainability action. The second aim was to explore how the elements of eco-fatigue from the public discussion might relate to the key variables of sustainability attitudes/concerns, perceived sustainability threats, perceived responsibility for sustainability action, perceived barriers to taking sustainable action, and self-reported sustainability action. This latter aim focused on understanding how different pathways might be mapped through the variables that have been linked to the concept of eco-fatigue.

2. Literature Review

2.1. Social Representations Theory

A social representation is a shared cognitive structure that allows individuals within a collective to make sense of complex or unfamiliar issues [9]. Social representations function as a bridge between individual cognition and collective understanding, shaping attitudes, beliefs, and cultural norms. They emerge through communication and interaction, helping to anchor new ideas within existing cultural frameworks [10]. SRT is a complex theory linking individual to collective beliefs and actions, existing at a molar level of analysis and bridging the boundary between sociology and psychology while maintaining the psychology tenet of individual agency [8]. The reader is directed to Franco and Lancia [11] for more detail on links between SRT and attitudes, social identity, and the importance of concepts such as cognitive polyphasia. Two key elements of SRT are of importance to the exploratory study reported in this paper: first, how social representations are developed; second, how these social representations vary across different social collectives. Social representations develop through two interrelated processes: anchoring and objectification [6]. Anchoring involves associating new or abstract concepts with pre-existing knowledge, making them more understandable. For example, one way sustainability is anchored

is by linking it to the familiar idea of personal responsibility for the environment. For example, when individuals encounter sustainability discussions, they often relate them to already established notions of individual action such as recycling, saving energy, or reducing waste, rather than broader systemic or political changes [12]. This anchoring process makes sustainability more accessible but can also limit its scope, as it frames action as existing solely at the individual level rather than also addressing larger economic or policy-driven factors [13]. Objectification assists by transforming abstract concepts into concrete symbols, often disseminated through public media. A prominent example of objectification in the sustainability discourse is the **"carbon footprint"**—a quantifiable measure of an individual's or organization's environmental impact that makes abstract concepts of impacts more tangible and easier to visualise [14]. These processes occur through communication within communities, particularly via mass media, and interpersonal, now often online or digital, discussions.

Moscovici [6] also distinguished between two key knowledge domains in SRT—the reified universe and the consensual universe. The reified universe is associated with expert professional or academic knowledge, with concepts developed systematically and established on evidence-based arguments. In contrast, the consensual universe consists of lay/everyday interpretations and socially constructed meanings [9]. The consensual universe is shaped by social interactions, cultural norms, and collective meanings constructed through communication [6]. In the consensual universe, knowledge is fluid, dynamic, and open to interpretation, allowing individuals to engage with and transform ideas in ways that make sense within their social context [15].

Tensions can arise, however, when representations in the reified universe do not align with those in the public domain. One key issue occurs when scientific knowledge is poorly communicated or contradicts established social beliefs. For example, climate science, rooted in the reified universe, is often contested in the everyday universe due to political, cultural, and ideological factors [11]. Tensions arise when scientific knowledge from the reified universe conflicts with everyday meanings in the consensual universe. This misalignment can lead to resistance, misunderstandings, or the reinterpretation of expert knowledge. Effective dialogue between these domains is essential for ensuring that complex issues, such as public health policies or climate change, are successfully integrated into public understanding [10]. Pol and colleagues [16] argue that understanding social representations of sustainability action is a key step to improving communication and policies to encourage individual sustainability action.

2.2. Eco/Green Prefixes in Psychology

The academic discipline of psychology has shown increasing awareness of, and interest in, exploring how existing models of human thought, emotion, and action might be used to address sustainability issues. Figure 1 provides an overview of the major stages between awareness and deliberative action, expanding on Moscardo's [17] model with reviews of the relevant psychological literature. This model summarises the most common psychological theories, concepts, and variables applied to each stage. It should be noted that this is not an exhaustive list but an attempt to provide an overview of the complexity of the problem facing sustainability communicators and policymakers.

The centre of the framework presented in Figure 1 provides the well-established set of steps between awareness of sustainability issues and action taken to address the issues. It highlights the importance of acceptance of personal responsibility, the development of a relevant attitude supporting intention to act, and the factors linked to ability that intervene between intention to act and the action itself [18]. On the left-hand side are the external

factors that influence these key steps organized into the two core categories of sustainability communication and physical settings and systems.

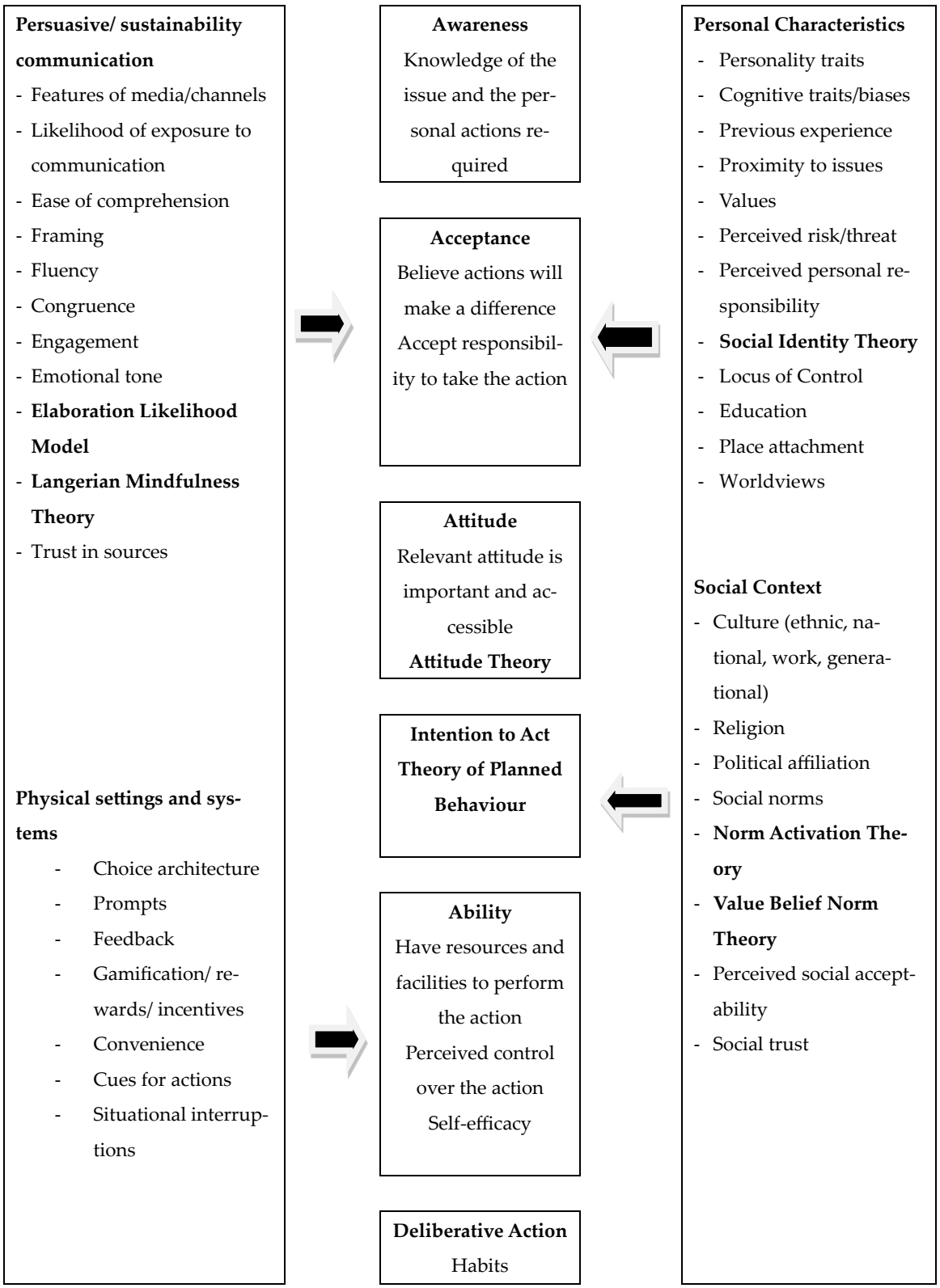

Figure 1. Framework of psychological theories and concepts linking sustainability action to sustainability awareness (see Appendix A for a list of papers used for this framework).

On the right-hand side are the two categories related to internal or individual variables that influence the central process, organised into the following two categories: personal variables and social context. Recent research underscores the significant influence of individual characteristics—such as personality traits, cognitive biases, values, risk perception, personal responsibility, locus of control, place attachment, and worldview—on sustainability-related attitudes, intentions, and behaviours. For instance, studies have found that the Big Five personality traits, particularly openness and conscientiousness, are positively associated with pro-environmental behaviours and attitudes [19]. Values, especially those emphasizing universalism and benevolence, have been linked to stronger environmental concern and sustainable consumption patterns [20]. Risk perception and a sense of personal responsibility also play crucial roles; individuals who perceive higher environmental risks and feel a personal obligation to act are more likely to engage in pro-environmental behaviours [21]. Furthermore, place attachment, or the emotional bond to one's environment, has been shown to motivate sustainable behaviours aimed at preserving local settings [22].

Recent research also highlights the significant influence of social context variables—such as culture, religion, social norms, and perceived social acceptability—on individuals' sustainability attitudes, intentions, and actions. Cultural values shape environmental behaviours; for instance, collectivist cultures often promote stronger pro-environmental norms and actions compared to individualistic societies. A study by Zheng et al. [23] found that cultural dimensions like collectivism and future orientation positively correlate with sustainable consumer behaviour. Religion also plays a pivotal role in shaping environmental attitudes and behaviours. A recent study by Ives and Kidwell [24] emphasizes that religious beliefs and spiritual practices can significantly influence individuals' environmental concerns and actions, often providing moral frameworks that encourage stewardship of the Earth. Social norms and perceived social acceptability are also powerful drivers of sustainable behaviour. A systematic review by Farrow et al. [25] indicates that social norms can effectively promote pro-environmental behaviours across various contexts, especially when individuals perceive that sustainable actions are socially approved and expected.

Moscardo [17] notes that it is important that researchers in this field recognise that multiple variables interact and create a range of different pathways from awareness to action. Any expectation that "a single or limited set of variables [will] make a significant difference is inappropriate" [17] (p. 2). Despite this, many researchers focus on only a few variables or concepts. They test for significant links to intended actions without justifying their choice. Often, they overlook the broader context in which these variables exist. For example, in tourism research, it is common to talk about an awareness/attitude–action gap without any apparent consideration of the other factors that exist between attitude and intended and/or actual action [17]. Whitmarsh and colleagues [26] add to this argument, noting that much research in this area is "too reductive, individualistic, linear, [and] deliberative" (p. 76) to offer much advice for practitioners in sustainability.

While there is a long history of psychological study of pro-social, pro-environmental, and pro-health actions, more explicit connections between the theories and concepts developed in these areas and sustainability issues only emerged in the early part of the 21st century [27]. This shift is especially clear in the adoption of eco/green prefixes linked to existing psychological concepts. Eco-anxiety is one of the earliest and most widely discussed examples of this, referring to chronic fear and distress about environmental change and climate crises [28]. Eco-anxiety has also been linked to eco-grief, or sadness linked to negative environmental outcomes associated with human impacts [29], and eco-guilt, or feelings of remorse over one's personal negative environmental impacts [30]. Green consumerism is another early example referring to behaviour patterns where individuals make purchasing decisions based on sustainability and ethical considerations [31]. Green or eco-identity

is another example referring to the importance of environmental concerns and actions to an individual's sense of self [32]. All these examples involve the adoption of the prefix without any major changes to the definition or explanatory mechanisms associated with the concept. Eco-anxiety, for example, is simply anxiety that results from a specific source, and eco-identity is an additional facet of self-identity in psychology with no major change in the overall approach to the concept of identity. In all these cases, the eco/green version builds upon an acknowledged and well-understood body of literature. Other uses of eco/green prefixes are different in that they are presented as new concepts with little to no connection to existing research or to empirical investigation. Examples include eco-paralysis, where people feel overwhelmed by environmental problems and avoid action [33]. Another is eco-loneliness, a feeling of disconnection when one's environmental concerns are not shared by their social group [3]. Eco/green fatigue (referred to as eco-fatigue in the rest of the paper) is an example of this latter type of prefixing.

2.3. Eco-Fatigue in the Academic Literature

An investigation of the academic literature revealed 10 academic papers published between 2002 and the end of 2025 that included the words "eco-fatigue" or "green fatigue". Two simply mentioned the words with no description or explanation [34,35], and two were textbook entries or general commentaries [27,36], leaving six actual studies. Table 1 summarises the key details from these six papers. One striking feature is the general lack of empirical investigation into the eco-fatigue concept. There have been no attempts to develop a measure of eco-fatigue and no testing or examination of the assumptions made about its features, its causes, or its claimed outcomes of decreased sustainability action. Eco-fatigue was never the primary focus of the research, and it was instead used as an explanation for outcomes such as decreased sustainability action or avoidance of sustainability messaging. Further, none of the papers placed eco-fatigue in the wider context of other concepts or linked to research on those concepts. For example, while several noted the potential link between eco-fatigue and personality traits, these were not connected to the extensive literature on personality traits and sustainability attitudes and actions. Overall, the emerging social representation of eco-fatigue in the reified universe mirrors discussions of it in the public domain. It is presented as a potential barrier to action with no systematic analysis. There is no clear understanding of what eco-fatigue is or how it fits into the existing theoretical and conceptual frameworks. Eco-fatigue explanations appeared to be developed by the individual researchers for the specific paper.

In their textbook, Pol and Marchand [37] provide a definition of eco-fatigue that summarises an emerging social representation of the concept in the academic literature. In this definition, eco-fatigue is described as "a feeling of being overwhelmed and believing that action will not achieve the desired results" (p. 36). The definition then describes two pathways that link this state to excessive, confusing, and alarmist sustainably messaging that over-assigns responsibility to individuals rather than wider systems. The first pathway links poor and negative sustainability communication with learned helplessness and a perceived lack of control over the factors that contribute to sustainability problems. This is an example of anchoring with the negative emotional states described for eco-fatigue connected to an existing concept, learned helplessness. The second pathway expands on the link between messaging and learned helplessness by noting that this is likely to vary according to personality variables, especially fatalism and pessimism, and cognitive traits, such as locus of control and self-efficacy beliefs. All papers agree that eco-fatigue is a result of poor sustainability communication.

Table 1. Summary of academic discussions of eco-fatigue.

Study	Definition/Explanation	Results from Data Analysis	Suggestions for Combating Negative Outcomes
[38]	Learned helplessness and anxiety resulting from information overload, excessive and confusing messaging, resulting in decreased sustainability action	Data did not support the claims	None
[39]	A combination of eco-anxiety and eco-grief leading to apathy and avoidance	Not empirical study	Focusing on hope in the messaging
[40]	Weariness and hopelessness as emotional responses to excessive negative messaging linked to decreased sustainability action	No data collected on eco-fatigue—used to explain other results	Positive clear messaging encouraging smaller actions with more frequent milestones that can be achieved
[41]	Negative emotions and lack of self-efficacy resulting from information overload and linked to personality and cognitive traits, linked to decreased sustainability action	No data collected on eco-fatigue—used to explain other results	Avoid fear, guilt and grief in messaging
[16]	Learned helplessness from negative messaging combined with personality traits and risk perceptions, linked to decreased sustainability action	No data collected on eco-fatigue—used to explain other results	None
[12]	No definition provided but linked eco-fatigue to extrinsic motivation for action	Found extrinsic motivation for sustainability action was linked to eco-fatigue	Need messaging to report on positive experiences and explicitly support self-efficacy

The academic discussion of eco-fatigue does, however, suggest that it is a distinct concept, and, based on the concepts outlined in Figure 1, a possible preliminary conceptual model of eco-fatigue can be suggested. Figure 2 is based on the main conclusions of the academic literature review. It argues that various social context and system variables can influence the nature of the sustainability communication that an individual is likely to encounter. Then, based on those experiences, mediated by personality and cognitive traits, eco-fatigue is a possible response. If eco-fatigue is the response, then it is linked to outcomes such as eco-anxiety, learned helplessness, and inaction on sustainability issues. While this preliminary conceptual framework provides a context for eco-fatigue, it is important to remember that none of the existing academic papers provide any empirical support for the claims. Thus, there is no empirical evidence available to be certain of the nature of the state, its antecedents, or its claimed link to decreased sustainability action, with many referring to mentions of the concept in the public arena to justify its inclusion in their discussions. The study presented in this paper seeks to begin to develop a body of empirical evidence to both confirm the claims made and begin to build a more solid conceptual framework for this potential concept.

Figure 2. Preliminary conceptual framework for eco-fatigue.

3. Methods

The research reported in this paper had two parts—a qualitative archival analysis of public online discussions to identify key features of the social representation of eco-fatigue and its link to sustainability action or inaction, and an exploratory quantitative

survey examining the underlying structure of elements of eco-fatigue and its links to other variables of interest.

3.1. Archival Analysis of Online Public Discussions of Eco-Fatigue

The first part of the research used an archival analysis of online discussions of three labels: ecofatigue, eco-fatigue, and green fatigue. This part addressed the first research objective to describe the social representation of eco-fatigue that exists in the consensual universe. Archival analysis can be defined as a qualitative research method that involves systematically examining pre-existing records, documents, or digital content to identify patterns, themes, and meanings [42]. In the context of online content, archival analysis is used to analyse digital texts such as social media posts, forum discussions, news articles, and websites to understand public discourse, cultural trends, and social behaviours [43]. This method allows researchers to study naturally occurring data over time, offering insights into historical and evolving perspectives without direct interaction with participants [44]. Archival analysis of online discussions is especially useful for exploring social representations because it directly examines the phenomenon where it is created and shared [45] and eliminates observer influence or response bias [46]. In the present study, a google search was conducted looking for any mention of the three labels—ecofatigue, eco-fatigue, and green fatigue. No date or domain limitations were initially set, but academic papers and reports that appeared were excluded from this analysis and instead used for the literature review, and any mentions of the labels that were less than 50 words were excluded. The search identified two items covering similar ideas—sustainability fatigue and eco exhaustion—and these were included. A total of 38 reports, news items, blogs, and online discussions were identified, with the first appearing in 2007 and the most recent in December 2024. Between 2007 and 2010, 16 articles appeared, reflecting reactions to the initial presentation of the concept; it was then not further discussed until 2019, when five items appeared, with nine items emerging in the 2021 to 2023 period and eight in 2024, supporting the emergence of established social representation.

3.2. Exploratory Survey Study

The second part of the research explored, using quantitative methods and data, the nature of eco-fatigue as described in the archival analysis. This exploratory component of the research focused on the second research objective, which was to determine whether eco-fatigue exists as a phenomenon separate to other psychological states and examine how it might relate to key variables including sustainability attitudes, perceived sustainability threats, responsibility for action, and self-reported sustainability action. To achieve this, the research used a self-completion survey questionnaire. The questionnaire was designed to collect data measuring the key variables, which would then be analysed using exploratory cluster analysis. Exploratory cluster analysis is designed to explore the pathways that connect the core elements of eco-fatigue through other variables to sustainable action. The self-completion questionnaire was distributed with the assistance of undergraduate students at an Australian university to a mixed sample of university students and others in the local community. A previous analysis of part of this dataset focusing on the link between eco-fatigue and sustainable tourism choices was presented at a conference on sustainable tourism [4].

3.2.1. Sampling and Sample Details

The study uses a convenience sample supplemented with a limited snowball technique wherein students were asked to hand hard copies of the questionnaire to friends, relatives, or colleagues. This resulted in a total sample of 182, which was considered to be sufficient for a preliminary exploratory study [47]. As the aim was to use the survey data for an

exploratory cluster analysis, determination of sample size using a G*Power analysis was not appropriate. G*Power analysis is designed for hypothesis-driven or regression based statistical tests, whereas cluster analysis is an exploratory, unsupervised method that does not rely on effect sizes or statistical power [48]. As such, sample size for cluster analysis is typically determined using rule-of-thumb guidelines rather than power calculations. Researchers generally recommend a minimum of 2–3 cases per variable, ideally 5–10, with at least 100 participants for stable clustering results [49]. As the survey questionnaire was unlikely to generate more than 12 variables for use in the cluster analysis, the target sample size was at least 120. The only exclusion criteria applied to the sampling were that the participants needed to be aged over 18 years to meet ethics requirements and sufficient English skills to read and understand the survey questions.

Two-thirds (67%) of the sample listed their occupation as student; 17% were employed in clerical, administrative, or sales positions; and 5% reported that they were professionals or managers. Most had either been born in or grew up in Australia (78%), with 16% being born or raised in Asia and the remainder from a variety of other countries. The age ranged from 17 to 58 years with 52% of the sample aged between 17 and 21 years, 31% between 22 and 30 years, and 17% aged older than 30. The majority (61%) identified as female and the remainder as male.

3.2.2. Survey Questionnaire Measures

The survey questionnaire consisted of the measures addressing key concepts in each of the stages outlined in Figure 1. Except for the eco-fatigue statements, the other key variables were measured using existing validated and reliability tested scales, and the details for each of these are provided below. The questionnaire was pretested with a small group of volunteer participants recruited from a community stakeholder group. To empirically investigate claims about the elements of eco-fatigue, the questionnaire included a set of statements developed from the discussions of the concept in the available public literature These included all the elements identified in the social representation that emerged from the archival analyses—locus of control, pessimism, scepticism, optimism guilt, perceived information overload, nihilism, and confusion. The questionnaire then included established measures chosen to address all of the core steps outlined in Figure 1 and additional variables that were discussed in the academic literature on eco-fatigue. These included the following:

- A measure of perceived sustainability threats developed from expanding the Environmental Appraisal Inventory, which measures perceived threats of different environmental issues [50] to include several social issues connected to sustainability (a measure of awareness and perceived threat) and uses a seven-point rating scale from 1 (no threat) to 7 (extreme threat);
- A measure of perceived responsibility for sustainability action;
- A measure of sustainability attitudes that combined the short version of the Milfont and Duckitt [51] Environmental Attitudes Inventory, which measures attitudes towards environmental conservation and sustainability with additional items on economic and social dimensions of sustainability adapted from Biasutti and Farte's [52] attitudes toward sustainable development scale and uses a seven-point Likert rating scale from 1 (strongly agree) to 7 (strongly disagree);
- A version of the sustainability action scale developed by Gericke and colleagues [53], which measures self-reports of engagement in various sustainable actions, which was extended using items from the Young Consumer's Sustainable Consumption Behaviour Scale [54] and uses a five-point rating scale from 1 (never) to 5 (always);
- A question asking for barriers to participation in sustainable action (a measure of ability);

- Socio-demographic measures including gender, age, occupation, and country of birth and recent residence.

4. Results and Discussion

4.1. Archival Analyses

A standard qualitative thematic coding approach was used to identify the key elements linked to the online discussions of eco-fatigue, ecofatigue, and green fatigue in the archival analysis. Thematic coding is a fundamental process in qualitative research that involves identifying, analysing, and reporting patterns (themes) within data. The process generally involves four main steps: data familiarization, generating initial codes, searching for themes, and defining and naming themes [55]. In the first step, data familiarization, one researcher read the websites/blogs and online discussion threads several times while taking notes on initial observations. The researcher then began step two, generating initial codes, identifying key features of the data that appeared meaningful. This step was guided by the concepts included in the awareness to action framework outlined in Figure 1. Information was also classified as follows: descriptions of the concept, explanations for its appearance, contributing factors, outcomes, and suggestions for change. Once initial codes are generated, the third step, searching for themes, involves grouping related codes into broader categories that capture significant patterns in the data. Themes should be internally coherent and externally distinct, meaning that each theme should meaningfully represent a unique aspect of the data [56]. The set of themes was then checked by an independent researcher [57]. Finally, in the fourth step, defining and naming themes, the coders developed clear names for each theme that reflect their meaning.

Table 2 provides a summary of the main themes linked to defining the features and explaining the contributing factors to eco-fatigue identified in this archival analysis. Definitions of eco-fatigue consistently described a combination of several negative affective states including scepticism, weariness, apathy, disdain, disinterest, and depression. This negative affective state was then typically described as resulting in depression and/or anxiety leading to avoidance behaviours. Avoidance or abandonment of sustainability action was the most common element of the descriptions, but with some discussions also describing avoidance of sustainability communication and discussion.

Several pathways were described in the descriptions of the factors and processes that lead to the eco-fatigue state. The first pathway focused attention on business performance and described eco-fatigue as being driven by scepticism and cynicism resulting from greenwashing tactics combined with discouragement from past experiences with underperforming green products and the exhaustion of researching truly effective options. The second pathway combined personality traits such as pessimism, fatalism, and learned helplessness, with the complexity and magnitude of environmental issues presented in sustainability communication causing certain individuals to feel powerless. Comments such as "some people are less prone to learned helplessness and they tend to be the ones who are especially good at adapting to situations and are unafraid of challenges" highlighted the personality dimensions of the phenomenon. The third pathway focused on problems in sustainability communication with many describing eco-fatigue as a reasonable response to overwhelming amounts of confusing and excessively negative messaging about sustainability action. As might be expected given the claim that the academic discussion has mostly just adopted the public description, the SR that emerges in the consensual universe for eco-fatigue is like that reported earlier in this paper. Surprisingly, the consensual universe has a more complex SR with an extra dimension of negative experiences with poorly performing products and business greenwashing leading to the additional negative responses of scepticism and cynicism. Further, it was also proposed in the consensual

universe that being tired and disillusioned with sustainability discussions was a reasonable response to excessive, confusing, negative messaging regardless of personality, cognition, or experience. This latter proposed pathway to inaction is consistent with the evidence from research into public education campaigns that focus on fear and guilt [58,59]. The consensual universe places much more responsibility for individual inaction on sustainability on problematic messaging and bad business behaviour than on the individuals and their beliefs or attitudes.

Table 2. Themes in online discussions of eco-fatigue and similar concepts.

Category	Themes	Quotes
Defining features and explanations	Nihilism and learned helplessness resulting from overwhelming and/or confusing messaging	"Eco-fatigue is the next step after eco-anxiety. It refers to the nihilistic feeling that the planet is too far gone, and that our eco-efforts thus don't really matter."
		"Green fatigue is the feeling of being overwhelmed by environmental issues, a sense of hopelessness or apathy, feeling as if one's efforts aren't making an impact and therefore giving up altogether."
		"Green fatigue is largely related to a psychological phenomenon known as learned helplessness which is when an individual faces a negative, perceived uncontrollable situation and stops trying to change that situation"
	Feeling tired and discouraged from negative messaging	"Many products on the market are now claiming eco credentials and it's making it really hard for consumers to know who is genuinely trying to do the right thing, and those who are pulling the wool over their eyes."
	Scepticism resulting from greenwashing/negative experiences with sustainable products/services	"The prospect of looming environmental catastrophe is such a complex crisis that many people feel overwhelmed. Because they can't solve all of it themselves, they abdicate responsibility for solving any of it and justify themselves by adopting a fatalistic attitude that there's nothing they can do to prevent global warming."

The SR of eco-fatigue in the consensual universe was also more complex in terms of the recommendations on how to manage eco-fatigue, which fell into two categories—ways for individuals to take personal steps to improve their mental health and recommendations that focused on ways organisations could improve sustainability messaging to avoid. In the first category were three main suggestions including to take a break from thinking about and acting on sustainability issues, identifying and focussing on smaller and easier actions and developing them as routines, and avoiding confrontational conversations and communications about sustainability. In the second category were suggestions to focus on success stories and encourage inspiration rather than guilt about sustainability action, and to emphasise the financial advantages of sustainability action and the social justice/social sustainability benefits of action, not just the environmental ones.

4.2. Survey Analyses

The social representations of eco-fatigue identified in both the academic literature and the public online discussions suggest that eco-fatigue is a unique phenomenon linked to but separate from existing psychological concepts used in understanding sustainability cognition and action. This indicated that the second part of the study would be valuable for exploring the unique features of eco-fatigue and its links to other key variables. A preliminary set of analyses were conducted on the variables measured in the exploratory survey to check for differences in patterns of responses on the main variables for the demographic variables of gender, age, occupation, and country of birth/residence. No significant differences were found. All analyses were done with IBM SPSS Statistics Package Version 27. The main analysis of the survey data involved three steps. Firstly, the descriptive

results and dimensionality of the eco-fatigue statements set were examined. Once eco-fatigue was identified as a distinctive variable, the second step of the analysis examined the descriptive results for the other variables utilising principal component factor analyses with orthogonal rotation as a tool for data reduction. The final step used exploratory cluster analysis to explore and identify the patterns of connections between the various measures. It then compared the clusters on reported sustainability actions and perceived barriers to sustainability action to identify different pathways from awareness to action.

The first analysis examined the eco-fatigue statements identified in the archival analyses in more depth (see Table 3). Although half of the sample (51%) agreed that small individual actions can add up to big differences in sustainability, 40% feared it may be too late to save the planet, and approximately one-third (31%) also felt that they did not have enough control to make a difference and that things may be getting worse no matter what individuals do (36%). Table 1 provides the principal component factor analysis results based on all ten statements about eco-fatigue, which identified four factors. The first factor combined all the negative elements proposed as contributing to eco-fatigue combining fatalism, perceived lack of control, and the inevitability of negative outcomes with a mistrust of businesses or greenwashing. This factor was labelled "eco-pessimism". The second factor appeared to be the opposite of eco-pessimism, combining positive statements and focussing on enthusiasm for overcoming sustainability issues, which was called "eco-optimism". Both these factors are likely to reflect personality traits of pessimism/optimism and external versus internal locus of control. The third factor combined a fear of it being too late to make a difference and a belief that it may be too hard to make a difference to sustainability issues with a dislike of being made to feel guilty for not doing more. This factor was labelled "eco-fatigue" as it represented a unique combination of responses to the present public discussion of sustainability issues. The final factor had one item about confusion that was independent of the other factors, and this could be a contributor to rather than a feature of eco-fatigue. This systematic empirical examination of the dimensions of eco-fatigue derived from the archival analysis revealed a more complex situation than suggested in the previous academic literature. It confirmed the description of eco-fatigue as a new type of response to sustainability issues and communication, linked to, but separate from, other variables.

The second step in the analysis examined the other variable measures. The aim of this second step was to reduce the number of variables for use in the exploratory cluster analysis. This step was taken to confirm that the underlying structures proposed for the established measures were as expected. A single index of sustainability attitudes was created with a Cronbach's alpha of 0.833, which is above the 0.7 level often cited as a good result [60]. Overall, the sample believes that sustainability is a serious issue. Two-thirds or more agreed that without change, major ecological catastrophes will occur. Many also believed that humans are severely abusing the environment and that quality of life depends on environmental protection. Additionally, they felt that governments should increase fair trade and reduce poverty and hunger (see Table 4 for a summary of responses). Attitudes were more varied for the items about support for specific policies to achieve environmental protection, willingness to engage in activism, and commitment to personal action. A score based on responses to all the items was calculated following the guidelines offered by Milfont and Duckitt [51]; 105 was the highest score, indicating higher levels of sustainability concern and support for sustainability action, while 7 was the lowest possible score. The mean score on the total scale was 80 (SD = 15.6). It is important to note that those in the sample are not ignorant of the issues, nor do they dismiss the importance of the issues. Therefore, arguments for inaction amongst this sample cannot be based on a lack of interest or belief in the need for sustainability action.

Table 3. Principal component factor analysis of eco-fatigue statements.

Eco-Fatigue Statements	% Rating Item Agree or Strongly Agree	Factors			
		1	2	3	4
I'd like to help save the planet but I don't have enough control over the things that matter to make a difference	31	0.85			
Sometimes it seems like things are just getting worse no matter what we do as individuals	36	0.71			
These days every business is talking about how responsible they are, but I don't trust many of them	24	0.69			
I believe that small individual actions can add up to big differences in sustainability	51		0.79		
I feel like the more I learn about being sustainable the more I feel some sense of control over my world	27		0.77		
I know not all companies are honest about their sustainability actions, but most are trying to improve the planet	13		0.62		
I am tired of people/businesses trying to make me feel guilty about what I do or don't do to protect the planet	10			0.78	
I'd like to do more for the planet but I'm just so busy with the rest of my life, it is hard to make room for another thing	24			0.67	
I sometimes fear that it is too late to save the planet	40			0.64	
I am very confused about what are the best options for sustainability	7				0.92

Principal component analysis with varimax rotation; only factor loadings above 0.60 are reported; total variance explained 68.3%.

A principal component factor analysis, also with orthogonal varimax rotation, indicated two distinct factors within the scale measuring perceived threats (see Table 5), one focused on environmental threats to sustainability (Cronbach's alpha = 0.88) and one focused on social issues in sustainability (Cronbach's alpha = 0.89). Two scores were computed, one for each factor, with the environmental threat scale ranging from 9 (no threat at all) to 63 (extreme threat) and the social threat scale ranging from 3 (no threat at all) to 21 (extreme threat). The sample scored a mean of 43.3 (SD = 9.3) on the environmental threat scale with a mean score of 12.3 (SD = 3.7) on the social threat scale.

Table 6 provides a summary of the responses to both the questions about sustainability actions and the barriers reported for those who said they never or rarely engage in an action. Most of the sample reported engaging often or always in recycling, with high numbers participating to some extent in purchasing organic food and environmentally friendly and socially sustainable products. A total score was also computed for these sustainable actions that ranged from 12, meaning respondents reported never engaging in any of the actions, to 60, meaning respondents reported always engaging in all actions. The mean score was 36.7 (SD = 6.3), with 56% reporting that they engaged at least sometimes in most of the actions. The most common barrier across many of the actions was not having the facilities, time, or resources required. Another commonly mentioned barrier was a belief that these actions would not make a difference to sustainability threats.

Table 4. Responses to sustainability attitude statements.

Attitude Statement	Mean (SD)	% Strongly Agree/Agree
I am not the kind of person who makes a lot of effort to protect the environment	3.4 (1.3)	6.1
If things continue on their present course, we will soon experience major ecological catastrophes	5.0 (1.3)	68.3
I really like going on trips into the countryside and nature, for example, to forests	5.7 (1.3)	62.2
I am opposed to governments controlling and regulating the way raw materials are used in order to try and make them last longer.	4.1 (1.6)	19.5
I would like to join and actively participate in an environmentalist group	3.9 (1.6)	23.1
One of the most important reasons to keep lakes and rivers clean is so that people have a place to enjoy water sports	4.1 (1.8)	11.0
Modern science will NOT be able to solve our environmental problems	2.8 (1.3)	3.6
Humans are severely abusing the environment	6.1 (1.2)	74.4
I'd much prefer a garden that is well groomed and ordered to a wild and natural one	3.6 (1.5)	30.5
Humans will eventually learn how to solve our environmental problems with science	3.4 (1.4)	31.7
Whenever possible, I try to save natural resources	5.4 (1.0)	46.4
Families should be encouraged to limit themselves to two children or less	3.8 (1.7)	15.8
Reducing poverty and hunger in the world is more important than increasing the income of the wealthy countries	6.1 (1.1)	76.8
Government policies should increase fair trade	5.9 (1.0)	68.3
Human beings were created or evolved to dominate the rest of nature	3.2 (1.4)	15.8
I would not want to donate money to support an environmental cause	2.8 (1.3)	6.1
Protecting peoples' jobs is more important than protecting the environment	3.0 (1.3)	7.3
I do not believe the environment has been severely damaged by humans	1.8 (1.2)	4.8
I think spending time in nature is boring	2.2 (1.3)	4.9
Human quality of life depends on environmental protection	5.8 (1.1)	67.0

Table 5. Principal component factor analysis of perceived sustainability threats.

Sustainability Threats	% Rating Item Very Strong or Extreme Threat	Factors	
		1	2
Loss of wildlife species	40	0.80	
Over population	20	0.78	
Carbon emissions	31	0.75	
Water pollution	20	0.75	
Managing the waste we generate	26	0.74	
Loss of natural vegetation	39	0.73	
Chemical pollution	33	0.72	
Declines in available drinkable water	23	0.68	
Climate change	45	0.67	
Increasing gaps in incomes of the wealthy and poor	23		0.90
Unfair treatment of women	17		0.89
Increasing intolerance of cultural and religious diversity	20		0.82

Principal component analysis with varimax rotation, only factor loadings above 0.60 are reported, total variance explained 69%.

Table 6. Responses to sustainability action questions.

Action	% Never/ Rarely	% Sometimes	% Often/ Always	Barriers Reported for Those in the Never/Rarely Category
Sort your household recycling	5	28	67	8% Don't know how 62% No facilities/resources 15% Doesn't make a difference 15% Other
Compost your food waste	40	15	45	9% Don't know how 74% No facilities/resources 17% Doesn't make a difference 17% Other
Sort and recycle plastics	6	23	71	9% Don't know how 55% No facilities/resources 0% Doesn't make a difference 36% Other
Buy food that has been grown without pesticides or chemicals	30	49	21	21% Don't know how 48% No facilities/resources 28% Doesn't make a difference 3% Other
Buy cleaning and other household chemicals that are environmentally friendly	33	35	32	16% Don't know how 44% No facilities/resources 32% Doesn't make a difference 8% Other
Seek out products from companies that have good environmental and social records	47	33	20	19% Don't know how 47% No facilities/resources 17% Doesn't make a difference 17% Other
Buy products made from recycled materials	24	49	27	15% Don't know how 30% No facilities/resources 35% Doesn't make a difference 20% Other
Walk or ride a bicycle to reduce my use of petrol	60	21	19	20% Don't know how 47% No facilities/resources 9% Doesn't make a difference 25% Other
Avoid buying products with excessive packaging	29	39	32	0% Don't know how 4% No facilities/resources 40% Doesn't make a difference 48% Other
Buy second hand goods	27	40	33	0% Don't know how 14% No facilities/resources 23% Doesn't make a difference 63% Other
Choose clothing from companies with ethical/responsible reputations	46	29	25	26% Don't know how 39% No facilities/resources 15% Doesn't make a difference 21% Other
Choose fair trade products	35	45	20	16% Don't know how 35% No facilities/resources 35% Doesn't make a difference 14% Other

The final step in the analyses used the variables identified in the previous steps as the input into a cluster analysis designed to explore the pathways that linked the core elements of eco-fatigue through other variables to sustainable action. Cluster analysis is a statistical technique that identifies patterns within data by grouping similar observations

into clusters, enabling researchers to uncover underlying structures without predefined classifications [61]. In psychology, this method is particularly valuable for discerning patterns in complex behavioural and cognitive data. For example, Benassi and colleagues [62] used cluster analysis to demonstrate how psychiatric diagnoses could be improved by understanding the pattern and variety of cognitive factors that were associated with different traditional mental health diagnoses. In a study of problematic technology use in adolescence, Amendola and colleagues [63] used cluster analysis to identify profiles of different types of at-risk adolescents, which helped to identify the different ways a variety of concepts could combine to create negative outcomes. As noted in the Methodology section, cluster analysis offers distinct advantages over regression modelling when exploring pathways connecting key concepts in complex situations. Linear, reductive approaches such as regression/structural equation modelling and experimental designs assess predefined relationships between variables. In contrast, cluster analysis identifies natural groupings within data without prior assumptions. This enables the detection of intricate patterns that may not be apparent through regression alone [64].

The present study used a K-means clustering approach. It included the four dimensions from the eco-fatigue statements, the total score on the environmental attitudes scale, scores on the two dimensions of perceived sustainability threats (social and environmental), and the perceived importance of the personal responsibility for addressing sustainability issues. Two, three, and four cluster solutions were examined, and the pattern of responses for each final cluster solution was used to determine that a two-cluster solution was clearest. Table 7 provides the profiles of the two clusters on the eight cluster input variables. Those in cluster 1 could be best described as eco-fatigued, confused eco-pessimists, while those in cluster 2 were eco-optimists. There was no difference between the two clusters on either perceived social or environmental sustainability threats. However, the eco-fatigued pessimists were significantly more likely to express higher levels of environmental concern. They also assigned less importance to personal responsibility than the eco-optimists. Consistent with giving personal responsibility lesser importance, those in the eco-fatigue cluster were also significantly more likely ($T = -1.7$, $p < 0.05$) to rate businesses as more important in taking responsibility for sustainability action than the eco-optimists, with a mean score of 3.8 (SD = 0.9) as compared to 4.1 (SD = 1.0). Table 7 also provides information on the mean scores for total sustainability action taken. In this case, there was not a statistically significant difference, but the mean score on sustainability action was lower for the eco-fatigued than the eco-optimist cluster.

Table 8 provides details on the sustainability actions, where a Chi-square test indicated significant difference at the $p < 0.05$ level. As can be seen in Table 6, the eco-optimists were more likely to engage often or always in household recycling, sorting, reducing and composting of food waste, and sorting and recycling plastics. They were also more likely to walk or cycle to reduce petrol consumption, avoid products with excessive packaging, buy fair trade labelled products, and seek clothing from ethical/responsible companies. Finally, Table 9 provides the barriers to action presented by each cluster. Given that these are based on multiple items, it is not possible to conduct any significant difference testing, but a lack of resources was not a major barrier to sustainable action for the eco-fatigue group. Rather, it appears that those in the eco-fatigue group were more likely to believe that the action would make no difference or to indicate that they did not know how to engage in the action.

Table 7. Cluster profiles on input variable and combined sustainability action.

Variable	Cluster 1	Cluster 2	T	*p*<
	N = 105 (58%)	N = 77 (42%)		
Eco-pessimism score	16.4 (1.9)	11.6 (1.7)	3.8	0.05
Eco-optimism score	13.8 (3.6)	14.7 (2.5)	3.9	0.05
Eco-fatigue score	14.0 (2.1)	11.7 (1.7)	3.2	0.05
Confused	4.0 (1.4)	3.4 (1.1)	2.9	0.01
Environmental Attitudes Score	80.7 (9.2)	78.5 (12.2)	5.1	0.03
Perceived social sustainability threat score	12.3 (3.8)	12.6 (3.7)	0.3	0.86
Perceived environmental sustainability threat score	43.0 (9.3)	43.0 (9.2)	0.05	0.90
Importance of personal responsibility for sustainability action	1.9 (0.4)	1.7 (0.5)	12.0	0.001
Total sustainability action score	36.0 (6.8)	37.2 (5.6)	0.63	0.43

Figures are mean scores with standard deviations in brackets.

Table 8. Cluster profiles on sustainability action items with a significant difference between clusters.

Sustainability Action	Cluster 1	Cluster 2	Chi-Square	*p*<
Sort your household recycling	76%	85%	9.0	0.05
Compost your food waste	40%	50%	9.4	0.05
Sort and recycle plastics	58%	85%	8.1	0.05
Walk or ride a bicycle to reduce my use of petrol	24%	36%	13.4	0.01
Avoid buying products with excessive packaging	34%	65%	17.9	0.01
Choose clothing from companies with ethical/responsible reputations	30%	56%	10.0	0.05
Choose fair trade products	21%	51%	9.3	0.05

Figures are percent responding often or always.

Table 9. Cluster profiles on barriers to sustainability action.

Barrier to Action	Cluster 1	Cluster 2
Don't know how	20%	11%
No facilities	31%	21%
No resources (time/money)	16%	52%
It won't make a difference	33%	18%

Figures are percentages, responding across all actions, of respondents that stated that they do not engage in the action.

The overall results of this final step in the survey data analysis revealed two distinct profiles—eco-fatigued and eco-optimists—highlighting differing pathways in the relationship between eco-fatigue and sustainability action. The eco-fatigue cluster was characterised by high levels of confusion, scepticism, and negative emotional responses to sustainability messaging, alongside lower perceived importance of personal responsibility for sustainability. Interestingly, this group reported higher levels of environmental concern than the eco-optimists, but this did not translate into significantly higher sustainability action. Instead, they expressed a greater reliance on businesses to take responsibility for addressing sustainability issues. In contrast, the eco-optimists cluster exhibited lower

eco-fatigue and confusion, placed greater importance on personal responsibility, and were more likely to frequently engage in a wide range of sustainable behaviours—including recycling, composting, avoiding excessive packaging, and supporting ethical consumption. Although both clusters perceived sustainability threats similarly, the eco-optimists reported slightly higher overall sustainability action scores, and their behaviours reflected a stronger alignment between attitudes and actions. Barriers to action differed notably: while a lack of resources was not prominent for either group, those in the eco-fatigue group were more likely to express doubts about the efficacy of their actions or report uncertainty about how to act—indicating a motivational and knowledge-based disconnect rather than practical limitations.

4.3. Summary

This archival analysis of online discussions about eco-fatigue revealed that the concept is broadly understood as a distinctive negative affective state marked by feelings of apathy, scepticism, and learned helplessness, often resulting in the avoidance of sustainability-related actions and conversations. Eco-fatigue is attributed to multiple pathways, including consumer cynicism from greenwashing, emotional exhaustion from negative or confusing sustainability messaging, and individual traits like pessimism or fatalism. Notably, public discourse places significant blame for inaction on overwhelming communication strategies and disingenuous business practices, rather than on individual shortcomings.

In summary, the exploratory cluster analysis based on the survey data suggested several contributing factors to eco-fatigue. These include underlying traits such as pessimism and low self-efficacy, combined with overwhelming and confusing sustainability messages. Messaging that overemphasizes individual responsibility, without acknowledging broader social action, also plays a role. Interestingly, higher—not lower—levels of environmental concern contributed to these effects. Together, these factors create a negative emotional and cognitive state labelled as eco-fatigue, which includes feelings of anger, guilt, helplessness, and futility. This, in turn, discourages sustainability action. Overall, the empirical evidence supports the existence of eco-fatigue as a separate psychological phenomenon as well as the preliminary conceptual framework outlined in Figure 2. It adds green washing and poor green product performance to the experiences of sustainability element and more detail on the eco-fatigue state itself, but the overall framework remains the same.

5. Conclusions

5.1. Study Limitations and Future Research Directions

Before presenting the major implications of this paper, it is important to identify some limitations to be noted in considering the representativeness of the results presented. Firstly, this is a preliminary exploratory study with a small sample size skewed towards university/college students used for the empirical analyses. Further investigations would need to be conducted on other samples including a wider range of ages and educational, occupational, and cultural backgrounds to test for consistency in the structures identified in the present paper. Secondly, the survey study used a limited range of measures focusing on first testing the elements described in the SR of eco-fatigue in the consensual universe. Further research is needed to match these elements of eco-fatigue with established measures of the proposed variables such as pessimism, locus of control, perceived self-efficacy, exposure to sustainability messaging and perceived features of that messaging and its effectiveness. Future research in this direction should also more closely examine potential social desirability biases. Thirdly, future research directions should develop a measure of eco-fatigue independent of the personality and cognitive traits. This process should include conducting both exploratory and confirmatory factor analyses with Composite Reliability

measures. Fourthly, this independent eco-fatigue measure can then be used to test different types of sustainability messaging focusing on features of messages that can be linked to eco-fatigue responses. Of particular importance would be studies examining the effectiveness of more positive messaging and messaging that focusses on smaller, more specific actions with clear information about the potential of those actions to make substantive differences to sustainability issues.

5.2. Implications for Academic Practice and Conceptual Approaches to Understanding Sustainability Action

This study makes a significant and unique contribution to advancing conceptual understanding in the field of sustainability communication, public education, and green marketing by critically examining the use and implications of the term eco-fatigue. It cautions against the uncritical adoption of "eco" or "green" prefixes to existing concepts without robust theoretical grounding or empirical validation. The findings underscore the importance of situating new eco-concepts within a broader conceptual framework that spans the continuum from awareness to action and aligning them more closely with existing psychological and behavioural research. By disentangling eco-fatigue into its core components—eco-pessimism, eco-optimism, and sustainability-related guilt—this research refines and expands previous definitions, offering a more nuanced and actionable conceptual model.

The study further advances theoretical development by mapping the psychological pathways associated with eco-fatigue, highlighting its connections to constructs such as learned helplessness, fatalism, and locus of control. This integrative approach bridges sustainability research with motivational and behavioural psychology, opening new avenues for interdisciplinary exploration. Additionally, the analysis of online discourse reveals that public perceptions of eco-fatigue often attribute responsibility to external agents—such as corporations and communication strategies—rather than individual traits, emphasizing the need to examine these concepts within their broader social and cultural contexts.

Importantly, the cluster analysis illustrates that eco-fatigue impacts sustainable behaviour through multiple, context-specific pathways, including attitudinal resistance, perceived inefficacy, and external barriers. These findings suggest that public education and marketing strategies must move beyond universal messaging to adopt segmented, psychologically informed approaches. Ultimately, this research lays the groundwork for designing more targeted and effective sustainability communication and education programs that resonate with diverse public mindsets and address the specific barriers that inhibit sustainable action.

5.3. Practical Implications

The findings of this research provide several key insights that can inform practical approaches to addressing eco-fatigue and promoting sustainability action. One of the clearest implications is the need to reformulate sustainability communication strategies. This finding suggests that interventions must be tailored to different psychological and contextual factors rather than adopting a one-size-fits-all approach. The study's insights into eco-fatigue and sustainability attitudes provide a foundation for developing more effective environmental education programs. The results highlight that excessive negative messaging, confusing information, and guilt-driven narratives contribute to eco-fatigue. To counteract this, organizations should emphasise success stories, provide clear and actionable guidance, and frame sustainability as an opportunity rather than a burden. The pathway linking eco-fatigue to scepticism and cynicism underscores the importance of corporate responsibility. Businesses should prioritise transparency in their sustainability claims and ensure that green products meet consumer expectations. Regulatory bodies

may also play a role in holding companies accountable for misleading sustainability claims. Given that the individuals in the present study experience eco-fatigue as a psychological burden, it is essential to provide coping strategies that help them stay engaged in sustainability without feeling overwhelmed. Encouraging small, manageable sustainability actions and normalizing breaks from sustainability concerns may improve long-term engagement. The survey results also indicated that logistical barriers, such as lack of facilities or resources, are major obstacles to sustainable behaviours. Governments and organizations should work towards improving infrastructure, such as recycling programs, sustainable product availability, and incentives for eco-friendly behaviour. This study found that most of the respondents believed that they should not bear total responsibility for sustainability action. Policymakers must recognise this expectation and implement systemic changes rather than relying solely on individual action campaigns. Finally, sustainability advocates may also need to pay less attention to convincing people to believe in sustainability science and change their attitudes. Instead, they should give more attention to providing detailed, location-specific instructions for practical actions, highlighting how individuals can act both efficiently and effectively.

Author Contributions: Conceptualization, J.P.; Methodology, G.M.; Formal analysis, G.M.; Investigation, J.P.; Writing—original draft, G.M.; Writing—review & editing, J.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: This study was conducted in accordance with the Australian NHMRC National Statement of Ethical Conduct in Human Research and approved by the Human Research Ethics Committee of James Cook University (Approval H6865).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The dataset presented in this article is not available because participant consent was not sought for data sharing beyond the initial research study.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A. Review Papers Used for Figure 1

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Appendix B. Measures Used in Survey Questionnaire

Environmental Attitudes Inventory

Please indicate how much you agree or disagree with the following statements

I am not the kind of person who makes a lot of effort to protect the environment
If things continue on their present course, we will soon experience major ecological catastrophes
I really like going on trips into the countryside and nature, for example, to forests
I am opposed to governments controlling and regulating the way raw materials are used in order to try and make them last longer.
I would like to join and actively participate in an environmentalist group
One of the most important reasons to keep lakes and rivers clean is so that people have a place to enjoy water sports
Modern science will NOT be able to solve our environmental problems
Humans are severely abusing the environment
I'd much prefer a garden that is well groomed and ordered to a wild and natural one
Humans will eventually learn how to solve our environmental problems with science
Whenever possible, I try to save natural resources
Families should be encouraged to limit themselves to two children or less
Reducing poverty and hunger in the world is more important than increasing the income of the wealthy countries
Government policies should increase fair trade
Human beings were created or evolved to dominate the rest of nature
I would not want to donate money to support an environmental cause
Protecting peoples' jobs is more important than protecting the environment
I do not believe the environment has been severely damaged by humans
I think spending time in nature is boring
Human quality of life depends on environmental protection

Adapted Environmental Appraisal Inventory

The following is a list of environmental and social challenges that have been described for the world. Please rate how threatening you think each is to you and your community.

Water pollution
Carbon emissions from transport and manufacturing
Over population
Climate change
Declines in available drinkable water
Increasing chemical pollution in the places we live and work
Increasing intolerance of cultural and religious diversity
Unfair treatment of women
Loss of natural vegetation
An increasing gap in the incomes of the wealthy and the poor
Managing all the waste and rubbish we generate
Loss of wildlife species

Sustainability Action Scale

Thinking about different sustainability actions that you can engage in. Please rate how often you do these actions?

Sort your household recycling (Eg-Cans, Bottles, Hard Plastic Packaging etc)
Sort and Compost your Food Waste
Sort and recycle plastics

Buy food that has been grown without pesticides or chemicals
Buy cleaning and other household chemicals that are environmentally friendly
Seek out products from companies that have good environmental and social records
Buy products made from recycled materials
Walk or ride a bicycle to reduce my use of petrol
Avoid buying products I excessive packaging
Buy second hand goods
Choose clothing from companies that don't have poor working conditions for their staff
Choose fair trade products

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