UNIVERSIDADE CATÓLICA PORTUGUESA

CONNECTEDNESS TO NATURE AND SUSTAINABLE FOOD INTENTION: MEASURING NATURE CONNECTEDNESS AND THE ROLE OF SELF IN CONSUMPTION BEHAVIOR

Dissertation presented to Universidade Católica Portuguesa to obtain a Master's Degree in Psychology in Business and Economics

By

Gwen Spilker

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Under the supervision of Professor Cláudia Simão

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Abstract

Sustainable consumption behavior is a critical aspect of addressing current environmental challenges. This research study examines whether (1) manipulating connectedness to nature increases sustainable buying intentions. (2) whether state connectedness to nature is positively associated with sustainable buying intentions. (3) If self-transcendence mediates the relationship between state connectedness to nature and sustainable buying intentions. And (4) whether personal response efficacy moderates the relationship between state connectedness to nature and sustainable buying intentions.

The study employs a between-subject video manipulation design, where participants in the manipulation condition were exposed to videos aimed at inducing connectedness to nature vs. a control video. Subsequently, they completed a questionnaire assessing their emotions (awe, admiration, gratitude), sustainable buying intentions, state connectedness to nature, self-transcendence, and personal response efficacy.

The results demonstrated marginally significant differences induced through the manipulation, but no significant effects of the manipulation on sustainable buying intentions, rejecting the first hypothesis. State connectedness to nature was positively associated with sustainable buying intentions, supporting the idea that feelings of connectedness to nature influence sustainable choices. While self-transcendence demonstrated a positive correlation with state connectedness to nature, it did not mediate the relationship with buying intentions. The moderating role of personal response efficacy was also not significant.

While acknowledging potential limitations in the sample and measurement tools, this research underscores the multifaceted nature of these constructs and the importance of considering them comprehensively.

Keywords: sustainable buying intentions, connectedness to nature, emotions, manipulation

Abstract Portuguese

O comportamento de consumo sustentável é um aspeto fundamental para enfrentar os actuais desafios ambientais. Este estudo de investigação examina se (1) a manipulação da ligação à natureza aumenta as intenções de compra sustentável. (2) se a ligação do estado à natureza está positivamente associada a intenções de compra sustentáveis. (3) Se a auto-transcendência medeia a relação entre a ligação do estado à natureza e as intenções de compra sustentáveis. E (4) se a eficácia da resposta pessoal modera a relação entre a ligação do estado à natureza e as intenções de compra sustentáveis.

O estudo utiliza um desenho de manipulação de vídeo entre sujeitos, em que os participantes na condição de manipulação foram expostos a vídeos destinados a induzir a ligação à natureza versus um vídeo de controlo. Posteriormente, preencheram um questionário que avaliava as suas emoções (espanto, admiração, gratidão), as intenções de compra sustentável, o estado de ligação à natureza, a auto-transcendência e a eficácia da resposta pessoal.

Os resultados demonstraram diferenças marginalmente significativas induzidas pela manipulação, mas nenhum efeito significativo da manipulação nas intenções de compra sustentável, rejeitando a primeira hipótese.

A ligação do estado à natureza foi positivamente associada às intenções de compra sustentável, apoiando a ideia de que os sentimentos de ligação à natureza influenciam as escolhas sustentáveis. Embora a auto-transcendência tenha demonstrado uma correlação positiva com a ligação do estado à natureza, não mediou a relação com as intenções de compra. O papel moderador da eficácia da resposta pessoal também não foi significativo. Embora reconhecendo as potenciais limitações da amostra e dos instrumentos de medição, esta investigação sublinha a natureza multifacetada destes construtos e a importância de os considerar de forma abrangente.

Palavras-chave: intenções de compra sustentável, ligação à natureza, emoções, manipulação

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Introduction

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.' (Leopold A., 1949).

Human activities are triggering enormous challenges to our environment. Unsustainable lifestyles, consumption and production patterns, greenhouse gas emissions, and a problematic global food system are contributing to environmental degradation and malnourishment (IPCC, 2023; Quiggin et al., 2021). The current food system promotes dietary patterns rich in animal products and calories that are damaging to both human and planetary health (Fresán and Sabaté, 2019). Additionally, rapid technological development and population growth are resulting in an unparalleled concentration of humans in (over)populated urbanized areas, disconnecting them from the natural world (Zylstra, 2014). Addressing these challenges requires complex changes. Not only on structural and policy levels but also on household and individual levels (OECD, 2017).

Individual's mental processes can either advance or hinder attempts towards sustainable behaviors (Zelenski and Desrochers, 2021). As consumers, our actions could help alleviate the strain on non-renewable resources and reduce greenhouse gas emissions that are driving the climate crisis. This heightened awareness and the call for humans to reconnect with nature, have led to a growing body of research interested in the relationship between humans and nature. An in-depth examination of the available literature on the human-nature connection in the fields of environmental and conservation psychology (Schultz, 2002; Saunders and Myers, 2003; Gifford, 2014), biological conservation (Miller, 2006; Simaika and Samways, 2010), and social-ecological sustainability research (Fischer et al., 2015), reveals evidence that the human connection to nature is increasingly viewed as the critical determinant for environmental protection and sustainable living (Giusti, 2018).

While a considerate amount of research has explored the relationships between connectedness to nature and psychological well-being and, to a certain extent, pro-environmental behaviors, there is a gap in understanding which interventions are effective and what they can influence. This gap extends to the consideration of other psychological constructs of self-transcendence, personal response efficacy, and emotions. Moreover, understanding what motivates individuals, can provide policy makers with valuable insights into the underlying factors that lead to environmentally damaging decisions, and help to develop more effective policies to promote sustainable decision-making (OECD, 2017). The objective of the study is, therefore, to deepen the understanding of the relationship between

connectedness to nature and sustainable buying intentions. Specifically, I aim to discern how connectedness to nature influences the promotion of sustainable buying intentions. Sustainable buying intentions serve as the primary measure in this study, as intentions are recognized as precursors to future behavior, providing insights into individuals' readiness to engage in pro-environmental actions (Ajzen, 1991).

The first chapter of the research introduces the construct of connectedness to nature, explores its multidimensionality, examines the benefits of increased connectedness to nature, and investigates the role of the self, emotions, and the construct of personal response efficacy, and their influence on sustainable buying intentions. Chapter 2 will discuss the previous research on the construct of connectedness to nature, how it can affect sustainable buying intentions, and the psychological constructs of emotions, self-transcendence and personal response efficacy. Chapter 3 describes the methods used for the experiment, where connectedness to nature was briefly manipulated between subjects, using two distinct videos. Chapter 4 then presents the findings of the study, aiming to enhance our understanding of how and if connectedness to nature can be induced and if this can affect participants' sustainable buying intentions. Additionally, it explored the role of self-transcendence as a mediator in this relationship as well as the moderating role of personal response efficacy. The last chapter, Chapter 5, discusses the results and highlights the possible benefits and challenges that come with the idea of a brief intervention to induce connectedness to nature to increase consumer engagement in sustainable buying behaviors. The paper finally ends by discussing the implications, notwithstanding the limitations which are also briefly discussed, of the research.

Literature review

Connectedness to nature

Nature is where we come from, it is where we are born, and by which rules we live. We rely on nature for our survival and nature relies on us to care for it, protect it, and restore it. This fundamental connection between humans and nature is widely understood. However, following the formulations of Schultz (2002), Mayer and Frantz (2004; 2009), and Bratman et al. (2019), we can distinguish this basic understanding of what it can offer us, with a more conscious – deeper - connectedness to nature. This conscious connection is about the way that we relate to, experience, think about, and feel nature.

Schultz (2002) described the human connectedness to nature as "the extent to which an individual includes nature within their cognitive representation of self". This concept implies that people who view themselves as a part of the natural world have a stronger connection to it. The definition of Mayer and Frantz (2004) is in line with the one proposed by Schultz where both see it as a fundamental part of the human experience. However, they describe it as an individual's affectionate and experiential connectedness to nature, rather than a cognitive connection. Their research highlights that a strong connectedness to nature causes love, appreciation, and enjoyment from being surrounded by nature (Mayer & Frantz, 2004; 2009). It is noteworthy to mention, however, that more recent research finds that Mayer and Frantz's conceptualization and their accompanying connectedness to nature scale rather measures cognitive beliefs than affective ones (Perrin and Benassi, 2009). Both definitions intend to highlight different aspects of the human-nature relationship. Their perspectives are valid and broad, but they are just two of the many diverse ideas, interpretations, and measurement approaches available in the literature on human-nature relationships. These widespread definitions pose challenges to forming a comprehensive understanding and a consensus in the field (Ives et al., 2017). This is for example reflected in the extensive mix of expressions used to describe the concept. As evidenced in research by Zylstra et al. (2014), where they highlighted the terms connectivity with nature (Dutcher et al., 2007), nature connection (Young et al., 2010), love and care for nature (Perkins, 2010), nature relatedness (Nisbet et al., 2009), connectedness with nature (Zylstra et al., 2014), connectedness to nature (Mayer and Frantz, 2004), and inclusion of nature in self (Schultz, 2001). In this research, we will refer to connectedness to nature.

Despite their differences, the array of definitions is often rooted in the most prominent theory on humans and their inherent affinity to nature, the Biophilia hypothesis (1993). First coined by the Psychoanalyst Erich Fromm, who stated that biophilia is "the passionate love of

life and of all that is alive" (Fromm, 1973), it was later further developed by the American ecologist Edward O. Wilson (1984) who proposed that this focus and need to affiliate with nature comes from our genetic base. In his book, the Biophilia Hypothesis, Wilson claims that all humans, to some degree, have inherited the tendency to seek connections with life and life-like processes, stemming from our evolutionary dependence on the natural environment for our survival and well-being (Wilson, 1984). In later works, Wilson found that this need to affiliate with other living beings stretches even further, beyond the human need for nature's material resources, to also include the human craving for aesthetic, intellectual, cognitive satisfaction, and spiritual meaning (Kellert & Wilson, 1993). Meaning that our Biophilia, inescapably, also influences our thoughts and feelings.

The recent attention and commitment for environmental awareness and behavior has led authors to discuss their concern for the human-nature relationship, which is due, in part, to the growing disconnect that is becoming more prevalent in Western societies. The exponential development of technology and the growth of the human population is causing an unparalleled disconnection between humans and the natural world. Our modern Western lives are more centralized in urbanized areas than in our evolutionary history in nature (Kellert and Wilson, 1993; Restall and Conrad, 2015). This influences the way in which individuals relate to nature and how they exploit the earth's natural resources (Mundaca et al., 2021). In the past, many authors have demonstrated and researched the positive effects of an increased connectedness to nature leading to many desirable outcomes as well as the negative effects of disconnection. However, it remains unclear what the details of this relationship are (Mayer and Frantz, 2009). For instance, connectedness to nature is often regarded as a construct that can be considered as both trait and state. Our inclination to feel connected to nature, as the Biophilia hypothesis assumes, is often seen as a trait. As such it is argued that connectedness to nature is stable over time and across different situations (Mayer and Frantz, 2004; Nisbet et al., 2009; Schultz, 2002). However, connectedness to nature is not the same for everyone. It is something that is susceptible to an individual's situational experiences and thus measured at the state level as well (Brügger et al., 2011; Nisbet and Zelenski, 2011; Schultz, 2002). For example, research has shown that connectedness to nature can increase or decrease by spending time in nature (Lumber et al., 2017; Nisbet et al., 2019) and by looking at or being in virtual nature (Mayer and Frantz, 2009; Richardson & Sheffield, 2015). Finally, demographic data indicates that connectedness to nature is more noticeable in women compared to men (Richardson et al., 2019). Differences across lifespans have also been found. Data obtained from Hughes et al. (2018) and Richardson et al. (2019) exhibits a

decline between the ages of 10 to 15 years in connectedness to nature followed by an increase at 20 to return to the population average. Other research found that female individuals that are older are typically linked to greater environmental concern, attitudes, and behaviors (Grønhøj and Thøgersen, 2009). Ultimately, the exact definition of connectedness to nature and how to measure it depends on the specific context and the aim of the research. In this case, connectedness to nature refers to the connection to nature people feel in a state, as well as their individual experiences and perceptions of nature.

Most authors concerned with connectedness to nature argue that an increased connectedness to nature is a crucial factor that influences (pro-) environmental behavior (e.g., Bragg, 1996; Chen et al., 2022; Cialdini et al., 1997; Mayer and Frantz, 2004). Additionally, individuals who have a stronger connection to nature tend to have more environmental attitudes and behaviors (Kals et al., 1999; Mayer and Frantz, 2004; Hinds and Sparks, 2008). The call for society to reconnect with nature has, therefore, been shared by numerous researchers over the past decades (Chen et al., 2022; Zylstra et al., 2014). However, with the complexity surrounding the topic's definition, the discussion is vague and the solutions on how to make societies re-connect unclear (Ives et al., 2018). Concreate measures and strategic interventions could serve as a catalyst to drive specific changes to enhance connectedness to nature (Lumber et al., 2017). Various authors propose the use of carefully designed interventions to increase connectedness to nature (e.g., Barrable and Booth, 2020; Kossack and Bogner, 2012; Mullenbach et al., 2018).

With the increased psychological and environmental psychological interest in the construct, various researchers have explored the different factors that form the connection to nature. By focusing on the underlying factors that facilitate the human-nature connection we can improve our understanding of how to address environmental problems. The subsequent section provides a more detailed overview of the dimensions of the construct.

The dimensionality of connectedness to nature

Since connectedness to nature is a construct that is complex and knows many conceptualizations and measures, examinations of the literature, like Tam's (2013), attempt to find the similarities and differences between the various definitions. In their comparison of the literature, Tam (2013) finds that there are at least 17 scales that measure connectedness to nature. The scales often reflect an "essentially unidimensional" view of researchers such as Mayer and Frantz (2004; 2009), Kals et al. (1999), and Davis et al. (2009), where each focus on one main aspect of human nature connection. According to their studies these are affective, cognitive, or behavioral (Tam, 2013).

There are other approaches are centered around a more multidimensional perspective (Clayton, 2003) using concepts of environmental identity which captures several dimensions, such as how people engage with the environment, the significance of nature, how they feel a sense of belonging to it, and how they experience positive emotions when they are in it. And Nisbet, Zelenski, and Murphy's (2009) concept of nature-relatedness, covers the affective, cognitive, and experiential aspects of connectedness to nature (Tam, 2013). Another perspective on the multidimensionality of the human-nature connection comes from Ives et al. (2017; 2018). Where they labelled five categories which should be considered on a spectrum that ranges from external connections to internal connections starting with (1) material, (2) experiential, (3) cognitive, (4) affective, and finally (5) philosophical. The material connection refers to the use of resources that come from nature, the experiential category covers interaction with nature, the cognitive category captures the importance of knowledge, awareness and attitudes towards nature, the affective category discusses empathy towards nature and the philosophical perspective covers the world view on how people should interact with nature (Richardson et al., 2020). Interestingly, Tam's results highlight commonality among the constructs and find that they all support the same underlying construct of connectedness to nature. Additionally, it is demonstrated that the dimensions are interrelated and should be considered multidimensional.

Comparably, authors such as Klassen (2010) suggest that other precursors to the human connection to nature include "prior knowledge, experiences in nature, cultural background and encounters with people that are dedicated and have high environmental concerns (Restall and Conrad, 2015). Schultz (2002), additionally, argues that connectedness to nature should be viewed in terms of three interrelated components that must act as values that connect all the other concepts and antecedents as aforementioned: connectedness, caring and commitment. Connectedness, because if individuals do not feel that they belong to nature they are not likely to care about it. Caring demonstrates individuals' concern for nature and the importance of caring for it. And finally, commitment as an individual's intention to act to protect nature (Schultz, 2002).

The cognitive dimension

In the past, the focus for descriptions of connectedness to nature has been rooted in the cognitive perspective. Research by Vining and Ebreo (2002) found that for the most part, the traditional approaches of conservation behavior focused mainly on attitudes and beliefs, the cognitive dimensions. The way we understand and are knowledgeable and aware of the natural world influences our perception and our interactions with nature (Schultz, 2002).

According to Schultz (2002), a key piece of human nature relationships is the cognitive awareness of the self. His theory on the *inclusion of nature in the self* (INS) is based on the cognitive scheme humans feel when they are connected to other humans, by finding the overlaps in these knowledge structures (Tam, 2013). His argument states that when people have a knowledge structure that includes nature's structure in the self, they have higher concerns for environmental issues (Schultz et al., 2004).

Furthermore, recent research has shed light on the reasons behind the link between how consumers perceive Corporate Social Responsibility (CSR) and consequently their positive attitudes and actions (Kim, 2017). These examinations have primarily focused on cognitive factors, revealing that when consumers perceive a company as actively practicing CSR, they tend to mentally associate themselves with that company through cognitive assessments (Mostafa and ELSahn, 2016).

Despite the existing research that focuses on cognitive aspects to reconnect or improve the relationship with nature, these usually do not result in an increased connectedness to nature, supporting the idea that a mix of dimensions is what is needed (Richardson et al., 2020). Simply informing people about the consequences of their consumption patterns, (e.g., climate change, droughts, species extinction) in this case, is not enough to change behavior (Gifford, 2011). For this reason, more and more research is being done on the role of emotions and affect in shaping behaviors and effective communication strategies (Odou and Schill, 2020).

The affective dimension

The role of emotions is crucial in influencing individuals' environmental concerns and behaviors. For instance, Hinds and Sparks (2008), found that the affective connection is what can predict one's intention to engage with nature. Moreover, other research finds that hope and joy and negative feelings such as worry have a predictive function in recycling behavior (Ojala, 2008; Gifford, 2014). Traditionally, there has been a lack of consideration of the affective dimension in connectedness to nature and how affect can promote pro-environmental behavior. Damasio (1998) attributed this to the historical disinterest in emotions in the cognitive psychology and neuroscience fields. However, over the past decades, significant attention has been given to the interconnectedness between emotions and cognitive processes, for it is believed that this is crucial to the study of human and nature relations (LeDoux, 1995; Damasio, 1998). Nowadays, it is considered of utmost importance for academics to consider emotions.

More recently research has demonstrated that how consumers perceive a company's CSR can impact their emotions as well as their cognition (Pérez and Rodríquez de Bosque, 2015). These emotions, in turn, affect the future consumption behaviors of the consumer (Wang and Wu, 2016). Scholars like Wang and Wu (2016), have made strong cases to consider the additional weight that emotions carry in the decision-making process compared to factors like price or consumer preferences. The emotional aspect, however, remains not fully comprehended. Especially its role as a mediator between CSR perception and consumer behavior (Fatma and Rahman, 2015).

Additionally, studies investigating the affective dimensions have found that both positive affect and negative emotions have significant consequences for pro-environmental behaviors and attitudes towards nature (Vining and Ebreo, 2002). And vice-versa, research has shown that the experience of positive or negative psychological constructs, such as happiness and well-being or pride and guilt are outcomes more prevalent to those that are more or less connected to nature (Capaldi et al., 2014).

Even though there is myriad of literature on the notion that positive emotions could increase pro-environmental behaviors, there are few direct experimental tests. They have often been unable to find a significant effect of affect induction on environmental choice. Recent studies have therefore focused on more self-transcendent emotions that shift attention outside the self. Positive emotions of awe, admiration, and gratitude are specific emotions that have been identified as being closely associated with connectedness to nature (Chen et al., 2022; Zelenski and Desrochers, 2021), and with providing positive paths towards sustainable behaviors (Zelenski and Desrochers, 2021).

Awe, for instance, has been evidenced to force humans into responding to stimuli that confront them with the insignificance of being human, and so shift their attention to entities that are bigger and more important than the self (Stellar et al., 2017). This can motivate pro-social behavior through attachment to groups and leaders and their pro-environmental agendas. Studies are increasingly finding that awe can be linked to heightened feelings of connectedness to nature (Nelson-Coffey et al., 2019), likely due to its positive influence on sustainable behaviors. However, it must be noted that awe can also induce negative feelings, such as fear, stemming from the unpleasant feelings of awe nature can elicit like disasters (Zelenski and Descrochers, 2021).

Furthermore, another positive emotion often closely linked to pro-environment and pro-social attitudes is gratitude (Chen et al., 2022). State gratitude is the feeling that is immediately elicited in individuals after they are voluntarily helped and is, therefore, also

known as a moral emotion arising from pro-social personality traits such as altruism (Emmons et al., 2001; Trivers, 1971). Additionally, gratefulness to nature is a well-researched topic. It is an emotion found at the base of cultural festivities (Tam, 2020), and is crucial for environmental protection (Joldersma, 2009).

Finally, admiration is a positive emotion that is often associated with feelings of wonder, respect, and appreciation. Darwin (1872/1998, p. 269) termed admiration as a "surprise associated with some pleasure and a sense of approval" (van de Ven, 2018). Admiration for the beauty, complexity, and diversity of the natural world can therefore lead to a deeper sense of being connected to and an appreciation of nature. Additionally, as could be derived from the biophilia hypothesis, the appreciation for aesthetics could trigger emotional responses that make someone feel connected to these elements of nature they find pleasing. Making them more likely to value it and desire its preservation. The research has found, although, in limited amounts, that admiration can be linked to environmental concern and pro-environmental attitudes and behaviors (Castro-González et al., 2019). These emotions are interconnected with connectedness to nature and self-transcendence and therefore, it is assumed that a strong connection to nature and positive emotions, such as awe, admiration, and gratitude will make individuals more inclined to participate in sustainable behaviors.

The anticipation of negative affect, however, also seems to be related to sustainable behaviors. For example, Carrus et al. (2008), showed that negative emotional anticipation plays a crucial role in environmental protection. In their study, the authors observed that when participants were induced with unpleasant emotions, they asked participants to imagine engaging in unsustainable behavior, like driving a car instead of using public transportation) they were less inclined to engage in this behavior. This disinclination was linked to the anticipation of negative emotions because of the behavior.

Evidence also shows that the role of affect can be extended towards the past. Studies measuring childhood experiences in the natural world have demonstrated that children who were raised in urban areas have a weaker inclination to bond with the natural world than children who have grown up in rural areas (Chawla, 2020). This pattern of increased contact with nature and positive attitudes and behaviors is sustained by the perspective of Millar and Millar (1996), stating that direct experiences with a certain object cause people’s evaluation of that same object as more affectionate, when compared to people who have indirect experiences. Additionally, repeated exposure to an object can significantly improve the affectionate connections with that object (cf. Zajonc, 2001).

The behavioral dimension

Cognition and affect are important components, but by themselves, are insufficient to steer individuals to actions benefiting nature (Kahn, 1997). The behavioral dimension of connectedness to nature influences one's motivation and willingness to act in ways that preserve the environment. Further examination of the behavioral dimension brings us back to Leopold's conception (1949) on the deep connection of humans and nature, where he states that we must view ourselves as "plain and simple members" of nature, which causes responsibility and motivation to engage in more eco-friendly activities. Similarly, Schultz (2000) suggested that developing a strong connection to the natural world might nurture a sense of empathy towards it. Which could, in return, serve as a driving force behind acts of care and altruism. Supporting this contention, Mayer and Frantz (2004), developed the concept of trait connectedness to nature, linking it to pro-environmental behavior: Individuals who described themselves as more connected to nature were also more likely to behave pro-environmentally (Mayer and Frantz, 2004,2009). Contrarily, a lack of connection to nature can induce passivity towards environmental degradation and protection thereof (Pyle, 2003).

The interconnectedness of all dimensions comes forth for example in research done by Fischer and Young (2007). In their study, it is demonstrated that public understanding and perceptions of biodiversity form attitudes towards biodiversity management which in turn affects one's understanding of processes that accompany this and could increase public support for restorative or conservation policies (Fischer and Young, 2007).

Benefits of increased connectedness to nature

Spending time in, looking at, and being surrounded by nature provides a myriad of benefits. Several scholars found nature significant and beneficial to an individual's physical, mental, and overall well-being, as well as to our societies and environments (Tauber, 2012). Understanding and promoting these benefits can be crucial in the cultivation of sustainable practices and are beneficial for human well-being and stewardship towards nature. The stimulation of one's connectedness to nature, can be an opportunity not only to increase an individual's well-being and health, that of their community, but also that of the planet. It is important to note, however, that the effect of contact with nature on well-being may be outweighed by other factors such as social factors, relationships etc. (Bratman, et al., 2019).

Physiological health and well-being

Numerous studies have demonstrated the benefits of nature to physiological health. For example, a study by Eickhoff and Ulrich (1981), which assessed the benefits derived

from one's visual exposure to nature, found that viewing a peaceful natural environment helps to reduce stress and promotes relaxation, in comparison to viewing urban scenes. Similarly, ample research on cortisol levels, a biomarker for human stress, found that nature-based interventions or exposure cause decreased 'peak cortisol levels' (Corazon et al., 2019; Twohig-Bennett and Jones, 2018; Roe et al., 2013). Additional research posits that exposure to virtual or real-life nature can enhance cognitive performance by reducing fatigue and improving concentration (Kaplan and Kaplan, 1989;). This is also known as the Attention Restoration Theory (ART). Additionally, higher human-nature contact inevitably promotes more active lifestyles, which decreases the risk of chronic health conditions, among which cardiovascular disease (Lachowycz and Jones, 2013; Richardson et al., 2013).
Moreover, the relationship between psychological well-being and nature exposure has received a great deal of scientific attention (Ives et al., 2017; van den Berg et al., 2015; White et al., 2017). Studies have shown that exposure to nature can have several mental health benefits. A study done by Berman et al. (2008), found that walking in or viewing nature improved directed attention abilities. Finally, it was also demonstrated that temporal boosts in mood can be induced through short walks in nature (Mayer et al., 2009; Nisbet and Zelenski, 2011).

However, findings of the research on individual well-being have been mixed, possibly resulting from how different aspects of well-being relate differently to connectedness to nature (e.g. Howell and Passmore 2013; Capaldi et al. 2014). Van den Berg et al. (2015) found a strong positive relationship in their study between reduced all-cause mortality and better mental health and living in green areas. Additionally, van den Bosch and Ode Sang (2017) found that being connected to nature causes a decrease in feelings of sadness and anger. In contrast, Lee and Maheswaran (2011), only found weak support for the relationship between urban green space and physical, mental, and overall well-being. Their literature review suggested that this could be due to differences in the quality and accessibility of green spaces and the use of physical activity.

Finally, there have also been long-term effects observed in the increased connection between children and nature. Albeit not necessarily a direct benefit, long-term studies on childhood interactions with nature demonstrate how positive attitudes and affect towards nature develop in later life (Keniger et al., 2013).

Social and psychological benefits

Social connections can be the basis of our connections with nature. Important characters such as Freud, Maslow, and Gandhi found that the human inherent sense of

belonging extends to not only our urban surroundings but also to our natural surroundings (Chen et al., 2022). Jennings and Bamkole (2019) found that people who spent time in natural settings had more social cohesion.

A wealth of data supports the notion that positive emotions can strengthen social ties. According to Nelson (2009), individuals who are experiencing positive emotions have higher levels of perspective-taking empathy, and social inclusion (Dovidio et al., 1995). For example, Baumeister and Leary (1995) found that social connection is an important predictor of positive emotions.

Some of the drawbacks that are due to a decrease in exposure to nature are less social contact, attention, and concentration, which in turn cause individual loneliness, a lack of social support, and an increase in crime and violence (Health Council of the Netherlands, 2004). The health council reports that people with more exposure and more concentration, show less aggressiveness and better social contacts. Research by Keniger et al. (2013) finds that urbanization can induce these negative impacts and underlines how providing access to green space can help mitigate these challenges.

Much of the existing research finds that increased interaction with nature, or the access to and availability of green spaces, tackles these issues, facilitates social interactions among both children and adults, and enhances interracial interactions in comparison to areas with limited greenery (Keniger et al., 2013).

Furthermore, research done in schools in Melbourne, Australia has demonstrated that teachers perceive social benefits from school children participating in nature-based activities. The advantages that were highlighted were increased social involvement and empowerment (Keniger et al., 2013). These studies show that an individual’s connection to others is significantly reflected by their connectedness to nature (Davis et al., 2009; Mayer et al., 2009).

Ecological benefits

It is important to stimulate connectedness to nature not just for the health of people but also for the health of the planet, as it is believed that there are also consequences for nature stemming from the relationships people have with it. As Roszak states, when people see themselves as part of the natural world, behavior that leads to the destruction thereof "will be experienced as self-destruction" (Roszak, 1995). It is therefore thought that connectedness to nature can drive collective or individual efforts towards pro-environmental behavior such as recycling (Mackay and Schmitt, 2019), and nature conservation behaviors and support (Mayer and Frantz, 2004; Whitburn et al., 2020). Additionally, Folke et al., in their study on

social-ecological resistance, underline the importance of earth stewardship. Feeling a deep connectedness to nature often leads to a higher sense of stewardship through increased feelings of responsibility, altruism, a sense of purpose and care for the environment (Folke et al., 2016).

Thus, a deeper connection and understanding of the natural world and its interconnectedness with "the human world" support sustainable lifestyles which in turn promote better environmental health through increased awareness, feelings of stewardship and affect and responsible behaviors. Although the research on the benefits of nature is excessive and promising, it is important to note that more in-depth research using representative samples is needed to further investigate the topic. Furthermore, most research into cognitive, and psychological well-being benefits are comparisons done mainly involving green spaces and urban settings. It remains scarcely studied what the effect of biodiversity is on the "benefits'' as stated above. Therefore, understanding how an individual's sense of connectedness to nature can impact their decision-making is of utmost importance (Restall and Conrad, 2015; Schultz, 2000).

The Role of Self in Sustainable Consumption Behavior

The debate on the most effective strategies that can promote environmental behavior in consumers is in the public eye. One approach is to appeal to self-interest (Griskevicius et al., 2010), emphasizing personal benefits like saving money or gaining social approval. This approach is one that is widely used but also severely criticized (Bolderdijk et al., 2013). Another approach, to appeal to altruism, is to encourage consumers to engage in pro-environmental behaviors for the sake of future generations and the environment (Evans et al., 2013). This approach is also widely used and can be categorized under conservation behaviors. Although both are effective in their own ways, the individual interests often conflict with those of the collective, this is especially common in environmental issues. For instance, opting to drive a personal car to work rather than biking can be beneficial for the individual as it is faster and more comfortable. However, the self-interested choice is harmful to the collective, as it causes air pollution and requires the use of natural resources (De Dominicis et al., 2017). While both altruistic appeals and self-interest appeals have been demonstrated their motivational powers for pro-environmental behavior (Bolderdijk et al., 2013, Griskevicius et al., 2010), this literature review delves deeper into the role of self-transcendence as an aspect of altruistic behavior that significantly influences sustainable buying intentions.

The concept of self is integral to understanding how individuals perceive themselves and the world around them, which, in turn, shapes their choices as consumers (Hood, 2012). This construct of self encompasses various dimensions, including the physical, emotional, social, and spiritual aspects (Sabharwal et al., 2017). In Western culture, the prevailing view of the self portrays it as an independent entity, separate from the external environment (Markus and Kitayama, 1991). Vining and Ebreo (2002) have examined that less tangible social motivators like place attachment and a deeper sense of connectedness to nature in the self can drive environmental action more than tangible incentives (e.g., financial ones). Moreover, over the past decades' authors have found that relying solely on external rewards to prompt conservation behavior can weaken intrinsic drives in the future and lower altruistic actions and is therefore not a long-term fix (Deci and Ryan, 1985). Consequently, scholars have explored various methods to influence intrinsic motives to act on their existing positive values and attitudes (Vining and Ebreo, 2002). Several authors have emphasized, the important role of individual values as well as social connectedness as crucial components of one's connectedness to nature (e.g., Schultz, 2002; Mayer and Frantz, 2004, 2009). Notably, Schwartz (1994) has found that individual values, especially those concerned with self-transcendence, greatly influence environmental concerns and behaviors.

Self-transcendence is a character trait that falls under the spiritual aspect of how an individual looks at themselves as being a part of society (Reeve, 2002), and therefore it is considered one of the elements of the self-concept. The idea of self-transcendence is that an individual sees oneself as a small part of a greater whole, which could be anything, like nature, the universe, all human beings in general, or a divine power. Viktor Frankl (1966) found that the model of self-transcendence is an essential constituent of the human ability to create meaning by helping and servicing others. He found that it is the motivation to help others, rather than seeking pleasure for the self, which is the essential part of self-transcendence. Another seminal theory on self-transcendence comes from Maslow's hierarchy of needs (1943). In his initial hierarchy of needs "self-actualization" was the highest level of human development. With this 5-stage hierarchy, Maslow proposed that human needs follow a hierarchy. The hierarchy exists out of four "deficiency needs", which develop because of deprivation and are thought to motivate individuals until the need is met, and one "being need", or a growth need, which comes from an individual's desire to continuously grow as a person. He argued that growth needs are less necessary for survival than deficiency needs, but they can realize an individual's full human potential. For one to progress to a higher-ranking need the lower need(s) should be first satisfied to some degree

(Maslow, 1987). Maslow, thus, initially saw self-actualization as the highest human need and the realization of an individual's highest capabilities.

In 1970, Maslow amended his conventional 5-level hierarchy. During the lecture "The Farther Reaches of Human Nature" (1971) Maslow referred to a revision of the initial hypotheses to include a realm that he termed the transhumanistic, later transpersonal, realm. As a result of this, it was not self-actualization that was the highest level of development but self-transcendence. Where the self-actualization need focuses on an individual's potential and self-growth, the transcendence need adds an extra dimension where an individual is motivated by values beyond oneself and sees oneself as being part of a greater whole (Maslow, 1971).

Similarly, Yaden et al. (2017) in their research, frame the states in which an individual experiences a lower sense of self in isolation and a higher sense of oneness between self and other, as self-transcendent experiences (STEs). They find that how the STEs are experienced can differ, from everything in between something akin to a routine like reading a book to an intense, possibly transformational, experience where an individual feels connected to all organisms and objects (Yaden et al., 2017). Other accounts on the state of self-transcendence discuss mindfulness (Davidson et al., 2003), flow (Csikszentmihalyi, 1991), peak experiences as Maslow termed it (1964), mystical, euphoric, joy and awe (Hoffman, 1988).

More recently, research has agreed with the sentiment that self-transcendent emotions like awe, compassion, gratitude, admiration, and love are instrumental to connection with others. Scholars like Stellar et al. (2017) and Keltner and Haidt (2003), indicate that self-transcendence is driven by appraisals that focus on the needs of others or have an other-oriented focus. The 'broadening of the self' is aided by self-transcendent emotions like awe, gratitude, and admiration as they increase feelings of interconnectedness with others and reduce self-importance (Stellar et al., 2017). Self-transcendent positive emotions not only improve relationships between individuals but also to the outside, natural, world (Van Capellen et al., 2013; Stellar et al., 2017). Similarly, Jacobs and McConnell (2022) found that self-transcendence predicts prosocial mindsets through their concern for others and should promote greater bio spheric concern and endorsement of self-transcendent values. In their research on the effects of self-transcendent experiences on environmental behaviors, Isham et al., (2022) for instance, found that the experience of awe positively affects the intention to engage in energy-saving behaviors.

Personal Response Efficacy

Changing individual consumption behaviors is no easy feat. Specifically, the skepticism and disbelief that is present in individual views on what can be achieved through more environmentally friendly and sustainable consumption of products and services are what holds individuals back (Meijers, 2023).

To inspire behavioral change, the literature suggests that individuals need to experience the feeling of an environmental threat next to the values and attitudes such as self-transcendence and connectedness to nature. And importantly, a belief that they can deal with the threat. This perspective aligns with the theories of Bandura (1977), who laid the foundation for this with his view on self-efficacy, which can be seen as the belief in one's ability to execute behaviors that are needed to get specific outcomes. Similarly, behavior change models, such as Fishbein and Azjen (1975) find that efficacy and response efficacy beliefs help explain pro-environmental actions (Meijers, 2023). Therefore, increasingly more attention is given to improving and maintaining consumers' beliefs in their capabilities in partaking in sustainable behaviors (personal efficacy), and their belief in achieving the sought-after outcomes (personal response efficacy). Subsequently, there is a synergy between connectedness to nature and personal response efficacy in that, people that feel the intimate connection to the natural world, perceive their actions as more meaningful and important to the environment. When people feel that their actions matter and can influence current environmental issues, it is more likely that they will act and change their buying behavior. For this reason, the current study hypothesizes that personal response efficacy can play a complementary role in the relationship between connectedness to nature and sustainable consumption intentions. Hypothesizing that individuals with a higher connectedness to nature and a higher personal response efficacy will demonstrate more sustainable buying intentions.

To summarize, a limited number of studies have investigated how brief nature interventions can impact one's connectedness to nature to subsequently affect sustainable buying intentions in consumers. Prior research has highlighted the benefits of an increased connectedness to nature to both human-kind and the planet (Berman and Kaplan, 2008; Carrus et al., 2008; Eickhoff and Ulrich et al., 1981; Nisbet and Zelenski, 2011). Additionally, virtual interventions have been demonstrated to affect this relationship, however, only limited and often with the goal of affecting psychological health or reflection abilities (Mayer and Frantz, 2009), rather than consumption patterns. Subsequently, the multidimensionality of connectedness to nature has been well documented in a myriad of

literature (Tam, 2013). This multidimensionality underscores the importance of considering the self in understanding the relationship between connectedness to nature and sustainable buying intentions. Since each dimension could interact differently with aspects of one's self-concept a further examination of these relationships should be taken into account. Finally, to ensure behavior changes the study aims to measure whether one's personal response efficacy plays an amplifying role in this relationship.

Therefore, the study proposes that interventions to increase one's connection to nature can affect one's sustainable buying intentions and this effect can be explained through or amplified by self-transcendence and personal response efficacy. The following hypotheses are explored;

H1: The manipulation of connectedness to nature increases sustainable buying intentions.

H2: A state of increased connectedness to nature is positively associated with sustainable buying intentions.

H3: Self-transcendence mediates the relationship between state connectedness to nature and sustainable buying intentions.

H4: Personal response efficacy moderates the relationship between state connectedness to nature and sustainable buying intentions.

By evaluating these hypotheses, the goal is not only to contribute to the understanding of state connectedness to nature but also to provide insights into how individuals can be encouraged to make more sustainable choices as consumers.

Methods

The objective of the dissertation is to investigate the relationship between connectedness to nature and sustainable buying intentions. Specifically, by examining this relationship I aim to determine the effect of connectedness to nature on promoting sustainable buying intentions. This section of the dissertation elaborates on the sample size and description, the survey experiment design, the survey experiment procedure, data collection and the analysis of the research.

Participants

To detect a moderate effect size ($d = 0.5$) using a t-test (means: difference between two independent means) the statistical power needed was calculated with a G*Power analysis (Faul et al., 2007). Power was set to 80% ($\beta = .80$), with a significance level of 5% ($\alpha = .05$). The minimum required sample size was 102 participants, (51 participants per condition). To reach as many participants as possible a convenience sampling technique was utilized. After a period of two months, a total of 150 participants were recorded as having started the survey experiment. After excluding the incomplete responses, the sample size was comprised of 98 complete responses. However, the final sample used in the analysis consisted of 87 participants, excluding participants who identified as vegetarians/vegans. Since vegetarian/vegan diet groups have no meat or fish intake and report higher intake of fruit and vegetables, they also indicate consumption patterns that are more environmentally sustainable (Segovia-Siapco & Sabaté, 2018). Thus, 11 participants who reported having a vegetarian/vegan diet were not included in the final sample.

The 87 respondents (Female $n = 50$, 57.5%) had a mean age of 38.01 years old ($SD = 15.41$) ranging from 19 to 70 years old and were mostly in a relationship ($n = 37$, 42.5% single, $n = 50$, 57.4% in a relationship). Most of the participants were working ($n = 10$, 11.5% working student, $n = 49$, 56.3% working), and most of the participants had obtained a graduate degree ($n = 35$, 40.2%) as the highest level of education. The political orientation of the participants is slightly more liberal than conservative ($M = 3.40$, $SD = 1.29$).

Table 1

Descriptive statistics of demographics without vegetarians/vegans N=87

Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
Age (years) *N*=87	38.01	15.41	19	85
Political orientation *N*=87	*3.40*	*1.29*	1	7
Dummy Gender (Female = 1) *n*=86	*Female*	*Male*		
	50	*36*	-	-
Employment *n*=85	*No*	*Yes*		
	26	59	-	-
Marital Status *N*=87	*Single*	*Relationship*		
	37	50	-	-
Education *n*=82	*Undergrad/Below*	*Bachelor*	*Master/PhD*	
	25	*35*	*22*	-	-

Experimental Design

Connectedness to nature was manipulated between-subjects using two distinct videos, randomly assigned to participants: one video was used to induce the feelings of being connected to nature (experimental condition, $n = 44$) and a video about science was used as a control video (control condition, $n = 43$). Participants in the experimental condition were exposed to a video task that focused on "Why does biodiversity matter" by the BBC[1]. The video presented participants with a concise depiction of the beauties of the Amazonia rainforest, the species that live there, and the importance of protecting them. Participants in the control condition were exposed to a neutral video that was unrelated to connectedness to nature or sustainable buying intentions[2]. The video shows several children partaking in the

[1] https://youtu.be/GkffhaVmC8M
[2] https://youtu.be/QX_oy9614HQ

"Marshmallow test", where the children are left with a marshmallow and tasked not to eat it with a promise of a bigger reward, more marshmallows if they abstain.

Design

Following the experiment, as discussed in detail above, participants were asked to rank their emotions of awe, admiration, and gratitude. Additionally, their behavioral intentions were measured through the Behavioral Intention scale by Goncalves (2015). Participants' state connectedness to nature was measured through the State Connectedness to Nature scale by Mayer and Frantz (2009). To augment the final assessment other scales were incorporated to capture the multidimensional aspects of connectedness to nature, with a focus on the self and positive affect, as demonstrated in the literature review. The Self-Transcendence scale by Reed (1991) was used to find mediation and a more comprehensive understanding of the constructs and their relationships. Additionally, it was hypothesized that if an individual has a strong sense of Connectedness to Nature and a high level of personal efficacy, they could be more likely to engage in sustainable buying intentions. For this reason, the personal response efficacy instrument from Meijers (2023) was used as a moderator. Additionally, this scale can be used as a check on the outcomes of the conditioning. If people are already scoring high in their connectedness to nature, for example by choosing to eat more sustainably, the conditioning will not have an effect which could, in turn, be confirmed through the personal efficacy measure.

Instruments

For an overview of the psychometric data of the instruments see Table 2.

Mediator Variables

Connectedness to nature. Participants completed the 13-item *state* Connectedness to Nature Scale (CNS), developed by Mayer & Frantz (2009). This scale measures an affective experiential sense of oneness with the natural world and measures if the sense of feeling the human-nature connection leads to more ecological human behavior. The scale was originally a trait measure to draw on an individual's affective and experiential connectedness to nature. However, to tap their present feelings of connection to the natural world Mayer & Frantz (2009) also created the 13-item state version. Thirteen items were aggregated to measure participant's connectedness to nature (e.g., ''*Right now I'm feeling a sense of oneness with the natural world around me''* and ''*Right now, I am feeling deeply aware of how my actions affect the natural world''*) ranging from 1 (strongly disagree) to 5 (strongly agree). Some

items were reverse-coded so that a higher connectedness to nature was always represented by a higher value. The index revealed high internal consistency with Cronbach's $\alpha = .83$.

Self-Transcendence scale. The 15-item Self-transcendence Scale (STS) is a one-dimensional scale that measures individual Self-transcendence and reflects on the connection to something greater than oneself (Reed, 2008). Participants reported their level of STS by indicating their level of agreement with a series of statements on how they see themselves at this time of their lives (e.g., "*Accepting myself as I grow older, finding meaning in my past experiences, helping others in some way*"). This scale used a 4-point scale ranging from not at all, very little, somewhat, to very much. The scale has been used widely and it has proven to be valid and reliable with Cronbach's $\alpha = .77$

Emotion scale. Participants' emotions were measured with three items: awe, gratitude, and admiration. Participants were asked to report the extent to which they were experiencing each of these emotions after watching the video, ranging from 1 (not at all) to 5 (extremely). Reliability with Cronbach's $\alpha = .74$.

Moderator variables

Personal response efficacy. The personal response efficacy instrument (Meijers et al., 2023) was used to measure participants' beliefs on the effectiveness of their actions in realizing pro-environmental outcomes (Witte, 1992). The 7 items included[5]: *By saving energy, I can help solve environmental problems, it makes a difference if I limit the use of natural resources.* The participants could indicate their agreement on a 5-point Likert scale ranging from strongly disagree to strongly agree. The analysis shows high internal consistency with Cronbach's $\alpha = .88$.

Dependent Variables

Sustainable buying intentions scale. Participants completed a three-item behavioral intention scale, adapted, and translated to English from Gonçalves (2015). The scale aims to examine the participant's future intentions to purchase sustainable food. Participants were asked to indicate how they would behave during their next shopping occasions on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). An example item is:

[5] Meijers et al. (2023), excluded the 3rd item ***Limiting the use of natural resources is effective in solving environmental issues*** in their final measurement as it had a poor model fit or lower face validity. Therefore, the final measurement will also exclude the 3rd item in making it a 7-item scale

Whenever possible, I will buy food that I consider to be sustainable. This scale reveals a high internal validity with Cronbach's α = .85.

Socio-Demographics:

All participants reported their gender, age, employment status, marital status, education level, political orientation, and whether their dietary habits were vegetarian/vegan or not. The other materials used in the survey are detailed below[6].

Table 2:

Psychometric data and reliability of instruments used (N=87)

Instruments	*Mean*	*SD*	*Min-Max*	*Items*	*Cronbach's α*
State connectedness to nature *Mayer & Frantz, 2009*	43.51	7.27	22-60	13	.83
Self-transcendence *Reed, 1987*	48.24	5.43	34-60	15	.77
Emotions scale *Gwen Spilker, 2023*	9.76	2.59	3-15	3	.74
Personal Response Efficacy *Meijers et al., 2023*	30.36	5.44	15-35	7	.88
Sustainable buying intentions *Gonçalves, 2015*	9.91	2.31	3-14	3	.85

Procedure

In April 2023, a survey was created using Qualtrics and was subsequently distributed on social media channels like Instagram, Facebook, LinkedIn, e-mail, and WhatsApp to find participants through convenience sampling. The collection of the data occurred between April 2023 and May 2023. Participants were given access to a personal Qualtrics page. After

[6] https://ucplbusiness.co1.qualtrics.com/jfe/form/SV_88kceNSI0sH6joG

clicking on the link, participants were informed that they would be taking part in a study that aimed to measure how much consumer decision-making can be affected by the relationship they have with their surrounding environments, no further details on the purpose and specific hypothesis of the study were given. Participants were told that they would be asked to watch a short video, followed by some questions about their social – and consumption patterns carefully and attentively. Once participants continued to the next page on Qualtrics they were asked to give their Informed Consent to agree to participate. Following this, participants were randomly assigned to one of the two groups. Either the control group video or the experimental group video which were both embedded in the Qualtrics survey.

After watching the video, participants responded to the emotions scale. In the next step, they completed the sustainable buying intentions scale, followed by the state connectedness to nature scale, the self-transcendence scale, and the personal response efficacy scale. Finally, at the end of the survey, a socio-demographic questionnaire was displayed. As a final step, participants were thanked for their participation and dismissed.

Data analysis

The data were collected through an online survey on Qualtrics to ensure accurate representation of a broader and more diverse population. Data analyses were conducted using SPSS version 28. The appropriate items for each scale were reverse-coded to ensure that higher values would always represent higher variable levels. Descriptive statistics were calculated for the sample demographics. Subsequently, chi-square tests were done to analyze the demographics of the non-categorical information. The tests confirmed that there was enough variability between the participants.

Descriptive statistics were then calculated for the variables, using the sum scores of the variables. After this, an analysis of histograms to identify outliers was completed to confirm the normal distribution of all the variables. There were outliers found, but these were minimal so no data were excluded (see appendix 1).

Consequently, a first data overview was performed where Pearson correlations and regression coefficients were calculated. Independent samples t-tests were subsequently utilized to compare the outcomes of the experimental and control group results. Finally, using PROCESS (Hayes, 2013) the mediation and moderation effects were examined. Specifically, a meditation analysis to explore whether the relationship between increased state connectedness to nature which influenced sustainable buying intentions was affected by self-transcendence. And moderation analysis was conducted to test if personal response efficacy affects the relationship between state connectedness to nature and sustainable buying intentions. Finally, additional exploratory mediation were conducted.

Results

Descriptive statistics

As a first approach to the data, participants reported feeling emotional in general (the composite index of awe, gratitude, and admiration). Descriptive statistics demonstrate (M = 9.76, SD = 2.59) that most participants experienced a moderate level of these three emotions (Min = 3, Max = 15).

As for sustainable buying intentions, participants showed a general tendency toward more sustainable buying intentions with M = 9.91 (SD = 2.31) on a sum scores ranging from 3 to 15.

The state of connectedness to nature demonstrates that in general, participants are moderately connected to nature (M = 43.51, SD = 7.27). The scale sum scored ranged from 13 to 65.

Analyzing the descriptive data on participants' self-transcendence levels, it is possible to observe that, at the moment of the survey, participants demonstrated a moderate-to-high self-transcendence level, reporting a mean of 48.24 (SD = 5.43). The possible sum scores ranged from 15 to 60.

Finally, self-reported personal response efficacy was high, with a mean of 30.36 (SD = 5.44) ranging between 7 and 35, indicating that they considered their pro-environmental behaviors effective, to some extent, in solving environmental problems.

Correlations

Correlation analysis revealed correlation between some of the variables of interest. Surprisingly, the manipulation of connectedness to nature did not significantly correlate with sustainable buying intentions or almost any of the other scales. The only statistically significant strong relation (r = .44, p < .01) was with the emotions scale. A marginally significant effect between the manipulation of connectedness to nature and the state of connectedness to nature (r = .17, p = .06) also emerged.

However, when looking at the relationships between all the other variables of interest, strong correlations were found. State connectedness to nature positively correlated with emotions (r = .30, p < .01), sustainable buying intentions (r = .52, p < .01), self-transcendence (r = .27, p < .01) and personal response efficacy with (r = .47, p < .05). Additionally, emotions and self-transcendence correlated (r =.26, p < .01), as well as sustainable buying intentions and self-transcendence (r = .20, p < .01) sustainable buying

intentions and personal response efficacy ($r = .55$, $p < .01$), and self-transcendence and personal response efficacy with ($r = .19$, $p < .05$).

Furthermore, in an exploratory analysis, the demographic variables age and gender, were also included in the correlation analysis. According to some evidence, there are generational differences in the levels of connectedness to nature (Grønhøj and Thøgersen, 2009; Hughes et al., 2018; Richardson, 2019) and differences between gender and connectedness to nature (Rosa et al., 2020). Although there was no significant correlation between age and the other variables, the same was not true for gender. Gender positively correlated with both the state of connectedness to nature ($r = .29$, $p = <.01$) and personal response efficacy ($r = .23$, $p < .05$).

Table 3:

Correlations between the variables and gender and age N=87

Variable	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
1. Manipulation	1							
2. Connectedness to Nature Scale	.168	1						
3. Emotions	.443**	.299**	1					
4. Sustainable buying intentions	.010	.519**	.119	1				
5. Self-transcendence	.057	.269**	.259**	.196*	1			
6. Personal Response Efficacy	.023	.464**	.117	.554**	.188*	1		
7. Gender	-.060	.288**	.109	.127	-.039	.229*	1	
8. Age	-.004	.005	.119	.109	.068	-.007	-.158	1

***Note*:** Entries are correlations between the variables using the sum. *p < .05 (1-tailed), **p < .01 (1-tailed).

Independent sample's t-test

To determine if the manipulation of connectedness to nature induced significant differences between the control and the experimental group, independent sample t-tests were performed on state connectedness to nature, emotions, and sustainable buying intentions (see

Table 4 below). With p one-tailed, equal variances were assumed, as assessed by Levene's Test for homogeneity of variances.

Firstly, it was tested whether the manipulation affected the state of being connected to nature. The results indicated a marginally significant relation between the manipulation and the state connectedness to nature, $t(85) = 1.57$, $p = .060$, $d = 0.34$. Thus, the experimental group showed higher levels of feeling connected to nature ($M = 44.70$; $SD = 7.38$) than the control group ($M = 42.28$; $SD = 7.04$). These results imply that there is some evidence that suggests that the manipulation influenced participants' feelings of connectedness to nature.

Secondly, the first hypothesis tested whether the manipulation of connectedness to nature increases sustainable buying intentions. The results indicated that there was a non-significant trend in the hypothesized direction with $t(85) = 0.10$, $p = .462$, $d = 0.02$. The results indicate that the experimental group had a minimally higher sustainable buying intention ($M = 9.93$, $SD = 2.23$) than the control group ($M = 9.88$, $SD = 2.42$).

Thirdly, the manipulation of connectedness to nature affected emotions (awe, gratitude, and admiration). The results showed a statistically significant effect, $t(85) = 4.56$, $p < .001$, $d = 0.98$. The experimental group showed significantly higher emotions ($M = 10.89$; $SD = 1.92$) than the control group ($M = 8.60$; $SD = 2.69$).

Table 4

Descriptive statistics in the experimental and control groups (N = 87)

	Group			
Variable	*Experimental (n=44) M (SD)*	*Control (n=43) M (SD)*	*d*	*p*
State Connectedness to Nature	44.70 (7.38)	42.28 (7.04)	0.336	.060
Emotions	10.89 (1.92)	8.60 (2.69)	0.978	<.001
Sustainable buying intentions	9.93 (2.23)	9.88 (2.42)	0.021	.462

Regression analysis

To answer H2: "A state of increased connectedness to nature increases sustainable buying intentions", regression was used to determine the strength and variation in explaining the relationship between a state of connectedness to nature and sustainable buying intentions. The analysis demonstrates that state connectedness to nature emerges as a significant predictor of sustainable buying intentions *(*β = .519, p < .001), explaining 26.9% of the sustainable buying intention variance, confirming H2.

Furthermore, the correlations as demonstrated previously (Table 3), indicate that the manipulation aimed at inducing connectedness to nature yields a significant effect on the emotions of awe, gratitude, and admiration. Therefore, though mildly exploratory, regression analysis (Table 5) was used to determine the strength and variation in explaining the dependent variable. Results reveal that the manipulation of connectedness to nature positively predicts the emotions of awe, gratitude, and admiration (β = .443, p <.001). The manipulation accounts for 19.7% of the variance in the emotions.

Table 5

Pearson regression analysis

IV	*DV*	*B*	*β*	R^2	R^2 *adj.*	*t*	*P*
Manipulation	*Emotions*	2.282	.443	.197	.187	4.561	<.001
Connectedness to nature scale	*Sustainable buying intentions*	.165	.519	.269	261	5.596	<.001

Mediation analyses

To test H3: Self-transcendence mediates the relationship between state connectedness to nature and sustainable buying intentions, a mediation analysis using PROCESS model 4 (Hayes, 2013), one-tailed was used (adjusted confidence level of 90%, Jollineau and Bowen, 2023).

The results revealed that the state of connectedness to nature significantly predicted self-transcendence (b = 0.20, SE = 0.08, t(85) = 2.57, p = .012, 90% CI [0.071, 0.330]), explaining 7.2% of the variance in self-transcendence. However, self-transcendence does not directly predict sustainable buying intentions (b = 0.03, SE = 0.04, t(85) = 0.63, p = .532,

90% CI [-0.043, 0.094]). Although the direct effect of connectedness to nature on sustainable buying intentions considering self-transcendence was significant (b = 0.16, SE = 0.03, t(85) = 5.20, p < .001, 90% CI [0.109, 0.211]), the indirect effect was not (IE = 0.01, $BootSE$ = 0.01, p > .05 90% CI [-0.012, 0.021]).

Moderation analyses

To test H4: the effect of connectedness to nature on sustainable buying intentions is moderated by personal response efficacy, a moderation analysis used PROCESS 4 (Hayes, 2013), model 1. The moderation analysis was conducted to test the interaction between the independent variable of state connectedness to nature, the moderator of personal response efficacy, and the dependent variable of sustainable buying intentions. The interaction between connectedness to nature and personal response efficacy was not statistically significant (p = .195, 90% CI [– 0.014, 0.002]). Meaning that there was no moderation found of personal response efficacy on the relation between connectedness to nature and sustainable buying intentions.

Exploratory analyses

An exploratory mediation analysis was conducted following the significant correlation between the manipulation and emotions. The analysis tested the serial mediation with emotions and state connectedness to nature as a chain mediation of the relationship between the manipulation of connectedness to nature and sustainable buying intentions. Using a confidence level of 95%, PROCESS model 6 results revealed a significant indirect effect of connectedness to nature on sustainable buying intentions through emotions and state connectedness to nature (IE =0.30, $BootSE$ = 0.16, CI [0.022, 0.660], p < .05. The effect of the manipulation to emotions was statistically significant (b = 2.28, SE = 0.50, t =4.56, p < 0.001, 95% CI [1.287, 3.277]. The link between emotions and state connectedness to nature was also statistically significant (b =0.79, SE = 0.33 t = 2.41, p = .018, 95% CI [0.136, 1.434]. The link between state connectedness to nature and sustainable buying intentions was also statistically significant (b = 0.17, SE = 0.03 t = 5.45, p < 0.001, 95% CI [0.108, 0.232]. The total effect, the path from manipulation to sustainable buying intentions, was not significant (b = 0.05, SE = 0.50, t =0.10, p = 0.923, 90% CI [- 0.943, 1.039]).

Finally, the direct effect of the connectedness to nature manipulation of sustainable buying intentions was not significant (b = -0.35, SE = 0.48, t = -0.73, p = .469, 95% CI [-1.303, 0.605]). Hence, there is a full mediation of emotions and state connectedness to nature

on the relationship between the manipulation and sustainable buying intentions. The mediation summary is presented in Table 6.

Table 6

Serial Mediation summary

Total effect (Manipulation -> Buying intentions)	Direct effect (Manipulation -> Buying intentions	Indirect effect	Confidence Interval		Conclusion
			Lower Bound	Upper Bound	
0.048 (p = .923)	-0.349 (p = .469)	0.131	0.025	0.252	Full mediation

The second exploratory analysis, using a confidence level of 95%, PROCESS model 4 results revealed a significant indirect effect of state connectedness to nature on sustainable buying intentions through personal response efficacy (*IE* =0.06, *BootSE* = 0.02, CI [0.027, 0.100], $p < .05$. The effect of state connectedness to nature on personal response efficacy was statistically significant ($b = 0.35$, $SE = 0.07$, $t(85) = 4.83$, $p < 0.001$, 95% CI [0.204, 0.490]. The direct effect of state connectedness to nature was also significant ($b = 0.11$, $SE = 0.03$, $t(85) = 3.48$, $p < .001$, 95% CI [0.045, 0.166]. Indicating that on average, state connectedness to nature has both a direct and an indirect effect, which is mediated by personal response efficacy, on sustainable buying intentions. Individuals who experience a higher connection to nature are associated with higher personal response efficacy which, in turn, positively affects willingness to make sustainable buying decisions.

Discussion

The present study aims to investigate the relationships between connectedness to nature, self-transcendence, emotions, and personal response efficacy. The additional dimension explores how these factors might influence sustainable buying intentions. The results shed light on how manipulation of connectedness to nature and these factors are interconnected and can influence an individual's willingness to make more sustainable choices when it comes to buying products.

The findings of this study demonstrate that a subtle manipulation of connectedness to nature has a strong positive effect on emotions, which in turn strengthens the state of being connected to nature inspiring more sustainable consumption behaviors. This suggests that emotions play a mediating role in the relationship between manipulation and sustainable buying intentions. Demonstrating that the manipulation affected participants' emotions rather than their state connectedness to nature. In the following paragraphs, we will discuss these findings and the hypotheses that were tested in more detail and consider their implications for theory and practice.

The exploratory analysis found that there was a strong positive effect of the manipulation on emotions. The significant correlation between emotions and manipulation can be because nature can elicit feelings of awe, admiration, and gratitude (Keltner and Haidt, 2003). Further regression found that emotions predicted state connectedness to nature, which in turn induced sustainable buying intentions. This follows the literature in that, feelings of awe have the potential to be enhanced by one's connectedness to nature (Nelson-Coffey et al., 2019), as well as the feeling of admiration which can be elicited through wonder and respect for the natural world (Darwin, 1872/1998; van de Ven, 2018). Research has highlighted that this sense of connectedness to nature can serve as a mediator in the connection between awe and active engagement in pro-environmental actions (Castro-González et al., 2019; Isham et al., 2022; Yang et al., 2018;), which is in coherence with the results of this exploratory analysis.

Due to these relations and evidence from the literature on these interconnections, I decided to test the interplay of emotions using chained mediation. Resulting in a full mediation effect of emotions and state connectedness to nature, on the relationship between the manipulation and buying intentions. This study yielded an intriguing result since it demonstrated that the manipulation affected emotions, rather than directly affecting connectedness to nature. Even though there was no direct correlation between emotions and

sustainable buying intentions, it still highlights the role of emotions in consumers' willingness to buy sustainably through state connectedness to nature.

The first hypothesis tested if the manipulation of participants' connectedness to nature increased their sustainable buying intentions. No correlation was found between the manipulation and sustainable buying intentions and, therefore, it can be assumed that the manipulation in this experiment did not have a meaningful direct effect on participants' intentions to buy sustainably, necessitating us to reject the first hypothesis. These results are contradictory to previous research where virtual interventions were used. Mayer and Frantz (2009) for instance, found that the participants exposed to nature, either virtual or in real nature, experienced increased connectedness to nature. The small differences between the experimental and control condition might be due to the video choices. Participants may have been more likely to feel emotions like awe, admiration, and gratitude, towards children, which were the central part of the video used for the control condition, something I did not consider when choosing the videos. Additionally, another very plausible explanation could be that the participants were already high in their connectedness to nature. This might have limited the impact of the manipulation, since individuals who are already strongly connected to nature may be less influenced to increase their connectedness. It is worth noting that the sampling technique used was convenience sampling, for which I gathered accessible and available participants through my network and their network. This sample may, therefore, not be a full representation of the broader population and have been subject to sampling bias (Bhandari, 2023). Interpreting the results of the study should be considered in this context. Furthermore, the manipulation had a marginally significant effect on state connectedness to nature. Indicating that there is some evidence that the manipulation induced the experimental group participant's feelings of connectedness to nature.

The second hypothesis tested whether the state of increased connectedness to nature increases sustainable buying intentions. Following the regression results state connectedness to nature positively predicted the sustainable buying intentions of the participants with 26.9%, confirming the hypothesis that when the level of state connectedness to nature of the participants increases, so do the sustainable buying intentions. As previously found in the literature, connectedness to nature often leads to a higher sense of stewardship through increased feelings of responsibility, altruism, a sense of purpose and care for the environment (Folke et al., 2016), it is therefore likely that people who are more connected to nature, are also more altruistic. There is evidence that shows that altruism and sustainability are highly connected (Bolderdijk et al., 2013, Griskevicius et al., 2010) and that this increased

connectedness to nature can drive efforts towards pro-environmental behavior (Mackay and Schmitt, 2019; Mayer and Frantz, 2004; Whitburn et al., 2020). Indicating that even though the attempted artificial connectedness to nature did not affect the sustainable buying intentions, the genuine present feeling of connectedness to nature does. This could mean that future research that aims to utilize interventions that foster a state of connection to nature, could indeed promote sustainable buying intentions. However, considering the first hypothesis, there might also be another reason for the hypothesis to be plausible. It can be argued that some of the participants were already high in their trait connectedness to nature (personal characteristic), which could have influenced their state connectedness to nature during the study.

Hypothesis 3 tested whether self-transcendence mediates the relationship between state connectedness to nature and sustainable buying intentions. This mediation followed literature that stated that self-transcendence can be a predictor of sustainable behaviors (Isham et al., 2022) and research that found a mediating effect of self-transcendence between mindfulness and sustainable consumer behavior (Joseph et al., 2022). The results of the mediation, however, found that although self-transcendence positively correlates with state connectedness to nature, it does not seem to explain how state connectedness to nature affects sustainable buying intentions. Even though mediation has been found in studies like Joseph et al. (2022), which mainly attribute it to the responsibility and the need to focus on others and the environment, it is not uncommon to find non-significant mediation of self-transcendence. There is a myriad of self-transcendence measures, and while this study utilized Reed's (1991) scale which focused more on personality traits and spirituality and altruism, self-transcendence can be measured in many ways. For instance, focusing on the positive emotions of self-transcendence (Chen et al., 2022), benevolence and universalism (Joseph et al., 2022) and others. To gain a more comprehensive understanding of the possible mediating role, future research could explore the role of self-transcendence using different scales.

The fourth hypothesis tested the moderating role of personal response efficacy on the effect of connectedness to nature on sustainable buying intentions. However, this effect was not statistically significant. This suggests that in the context of this study, personal response efficacy did not play a statistically significant role in moderating the relationship between connectedness to nature and sustainable buying intentions. I assume this could be due to several factors. Since personal response efficacy is an individual's belief in their ability to make a difference, this does not necessarily have to relate to connectedness to nature and the correlation might have been due to luck. Additionally, moderation effects are often small and

require larger sample sizes to detect an effect (Geiser, 2021). Finally, while the literature supports the role of personal response efficacy and connectedness to nature in sustainable buying intentions, Meijers et al. (2023), for instance, established its significance in public sphere actions, highlighting that consumers who believe they can make a difference on their own are more likely to engage in public pro-environmental actions, as they are more likely to believe they have a responsibility to act on environmental issues, this study might have not captured the hypothesized interaction. A reason why a higher or lower personal response efficacy did not moderate the relation between connectedness to nature and sustainable buying intentions can be found in the already established interaction between state connectedness to nature and sustainable buying intentions, as we found out in H2. I thus assumed that personal response efficacy might not have been a moderator but a mediator. As Bennett (2000) found, moderators are used to explain a weak relationship between two variables, and mediators are used to explain how or why two variables have a strong relationship.

Therefore, after finding no significant moderation effects, an exploratory mediation analysis was conducted to delve deeper into this relationship. This additional analysis was guided by the observed correlations between state connectedness to nature, personal response efficacy and sustainable buying intentions. The mediation analysis found that higher levels of connectedness to nature were significantly associated with greater personal response efficacy. Moreover, personal response efficacy demonstrated a significant influence on sustainable buying intentions. The inclusion of personal response efficacy into the model revealed a significant indirect effect, indicating partial mediation. It's important to note that this mediation analysis was exploratory, and as such, should be interpreted with caution. Nonetheless, it encourages future research to continue probing the complexities of personal response efficacy and to further uncover the promotion of individual beliefs in the effects of their sustainable behaviors.

Finally, as the initial correlations demonstrated, there were interesting effects between age and the other variables. The current research analysis that specifically looked for a correlation between age and connectedness to nature, which followed evidence from Grønhøj and Thøgersen (2009), Hughes et al. (2018), and Richardson (2019), found no correlation with age. When comparing with this literature, I suspect that this could be due to the sample of this research. For future research, it would therefore be wise to include demographic questions about the participants' ethnicity to check for cultural differences, as this has been found to also affect connectedness to nature (Krettenauer et al., 2019). Additionally, the

analysis of the data found that gender significantly and positively correlates with both state connectedness to nature and personal response efficacy. The gender effect on state connectedness to nature demonstrated that women when compared to men, have higher connectedness to nature and higher personal response efficacy. This was in coherence with findings that stated that women are more connected to nature and tend to prefer outdoor environments (Rosa et al., 2020).

Like any other study, this research also has limitations. First, the responses for the study were gathered using the convenience sampling technique. This may have led to sampling bias. The sample consisted only of 87 participants, which is a relatively small sample size. This limits the generalizability of the study's findings. Additionally, the participants might have already been high in connectedness to nature. Since the majority of the participants reported a bachelor's or master's as the highest level of education, this can allude to misrepresentation of the general population, as Gustavsen and Hegnes (2020) also found that people with higher levels of education are often more familiar with sustainability and university students are also found to be more interested and more willing to pay for sustainable foods.

As for the study design, the participants could have been more inattentive due to the uncontrolled environment the participants were in (Campbell and Stanley, 1963). They watched the videos in uncontrolled settings, unlike previous studies such as Mayer and Frantz's (2009). Thus, they may not have paid attention as was instructed before they started to watch the video. As mentioned in the discussion, the choice of videos might have also affected the outcomes of the study. It was realized only later that the control condition video might have introduced unintended emotions in the participants due to their content potentially confounding the results. Future research should consider the content of both the manipulative stimuli and the control video to ensure they align with the desired states and have no unintended effects.

Another notable, limitation of this study is that it assessed participants' future intentions to buy sustainably through a questionnaire. This might introduce hypothetical bias and the answers of the participants might not fully align with their actual behaviors in real-life settings. Therefore, future research might benefit from direct purchasing scenarios or real-life settings, such as asking questions in front of supermarkets.

Finally, the non-significant mediator of self-transcendence in the relationship between state connectedness to nature and sustainable buying intentions. Although it was hypothesized that self-transcendence would mediate this relationship based on the prior literature, the findings

did not support this contention. This could be due to several factors, not the least of all exploring the use of different measures of self-transcendence or alternative mediators.

Implications

Finally, the research findings demonstrate multifaceted implications for businesses, academics, politics, and individuals alike. Even though the subtle virtual manipulation of nature exposure did not yield a significant impact on the participants' sustainable buying intentions, it did reveal a marginal yet noteworthy effect on their state connectedness to nature in this study. This outcome aligns with the majority of the literature that does find significant effects of this connection. Consequently, businesses can consider employing brief nature interventions as a means to stimulate consumers' engagement in more sustainable consumption practices.

Furthermore, the study uncovered the crucial role of emotions, with the chained mediation analysis highlighting the strong positive effect of the manipulation on emotions, which subsequently fortifies the state of being connected to nature inspiring more sustainable consumption behaviors. This suggests that emotions act as a mediator in the intricate relationship between manipulation and sustainable buying intentions, offering businesses a pathway for influencing consumer choices through emotion-driven strategies.

Additionally, the demographic insights revealed stronger connectedness to nature woman, prompting sustainable marketing and communication efforts to deepen their focus on the engagement of the male audiences. This basis of gender understanding can refine marketing efforts and strategies and help communication approaches appeal to a wider consumer base.

Moreover, the current study contributes to the existing literature significantly by shedding light on the motivations of individuals, contributing a big deal to their positive emotions (awe, gratitude, and admiration) and their personal response efficacy. This insight, for instance, can aid policymakers in developing more effective policies to guide decision-making that leads to more environmentally friendly choices. Furthermore, the mediating role of personal response efficacy further emphasizes the interrelation between state connectedness to nature and sustainable buying intention. Advocating for the introduction of policies that underline or appeal to individuals' confidence in their ability to make sustainable choices and to comprehend the effect their choices will have, could therefore significantly influence individuals' behaviors. These implications together can offer a comprehensive understanding of the dynamics that surround sustainable consumption behavior, the

motivations of consumers, and the significant role of emotions herein, facilitating more informed decision-making in various domains.

Conclusion

Humans have an intrinsic affinity to nature, called Biophilia. This affinity is important not only for human beings but also for nature. However, we are becoming increasingly isolated from nature. Additionally, we are approaching crucial years regarding the environmental challenges humanity faces today. The unsustainable lifestyles, carbon emissions, and problematic food systems threaten our world as we know it (IPCC, 2023). The words of Aldo Leopold (1949) "We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect", resonate now more than ever.

Consumer choices, also, matter now more than ever. This study, therefore, explores the complex relationship between human-nature connections and sustainable consumer behavior. The main goal is to understand to what extent interventions focused on individuals' connectedness to nature can change their willingness to change their buying behavior to more sustainable behaviors. Considering other interrelated factors such as emotions, self-transcendence, and personal response efficacy.

Drawing upon existing research across multiple fields, it reinforced the notion that the human-nature relationship is pivotal for environmental protection and sustainable living. The hypothesis on the positive association between state connectedness to nature and sustainable buying intentions received support through the data analyses. However, the effect of the manipulation and the other hypotheses, like the mediating role of self-transcendence and moderating role of personal response efficacy, did not. These results underlined the complexities of the relationships and suggest the need for further exploration, potentially with a larger sample size and perhaps the use of different measures in a controlled setting.

The exploratory analyses, as evidenced in the literature, demonstrated the significant role of emotions. Specifically, the fact that the manipulation affected emotions rather than state connectedness to nature, underlines the power of emotions and the way they can act as intermediaries between connectedness to nature and drive sustainable buying intentions. Furthermore, while not hypothesized, influencing personal response efficacy may be an effective tool in mediating the relationship between connectedness to nature and sustainable buying intentions. Interventions aimed at increasing individuals' personal response efficacy could be promising in the promotion of sustainable buying behavior.

In closing, the big challenge, providing a future that is sustainable and fair for the next generations is not an easy task. However, this research offers valuable insights into the interplay of psychological factors influencing sustainable buying intentions. Where emotions

surprisingly emerge as the most important catalyst to induce pro-environmental behavior. The research highlights the significance of human connectedness to nature and the potential of positive emotions and personal response efficacy to inspire, eventually, lasting changes.

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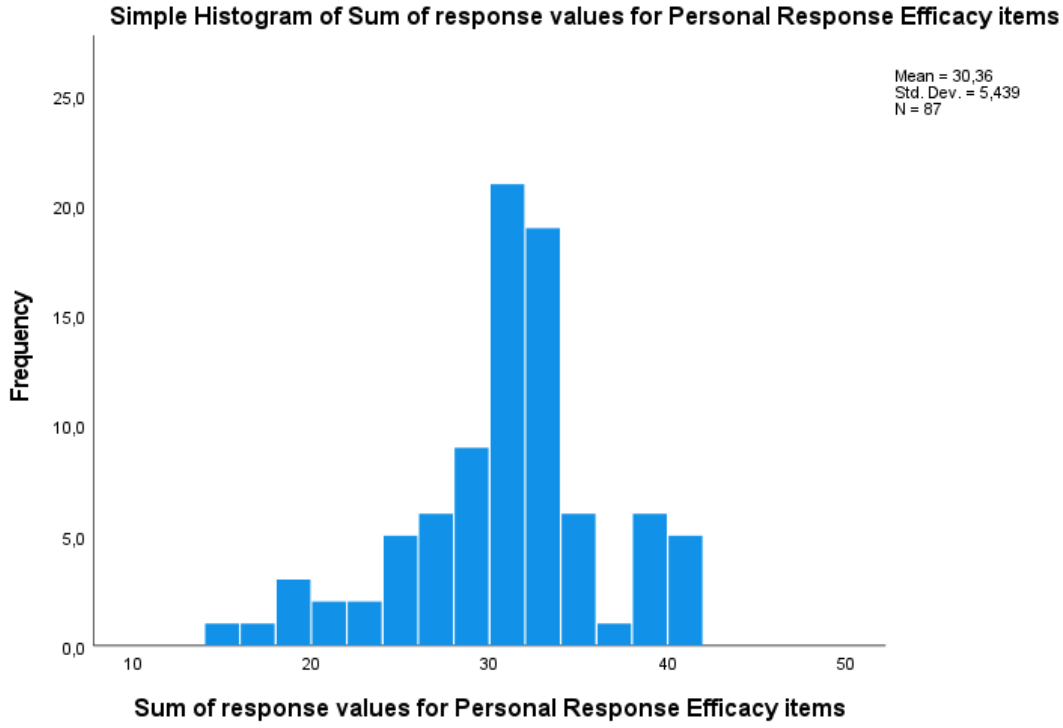
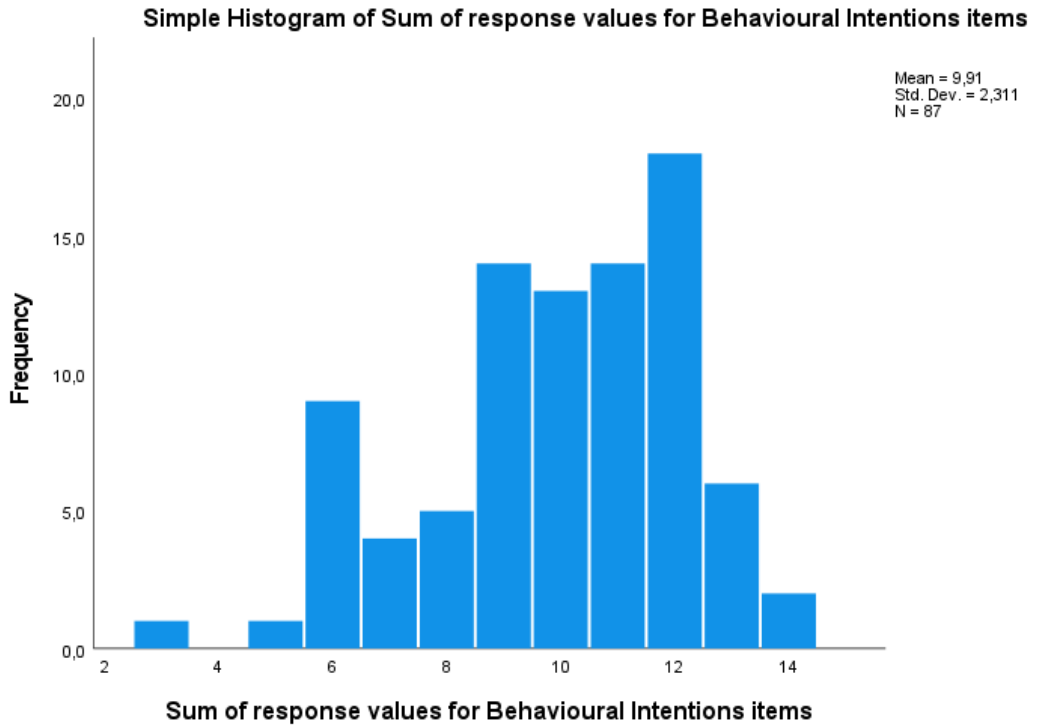
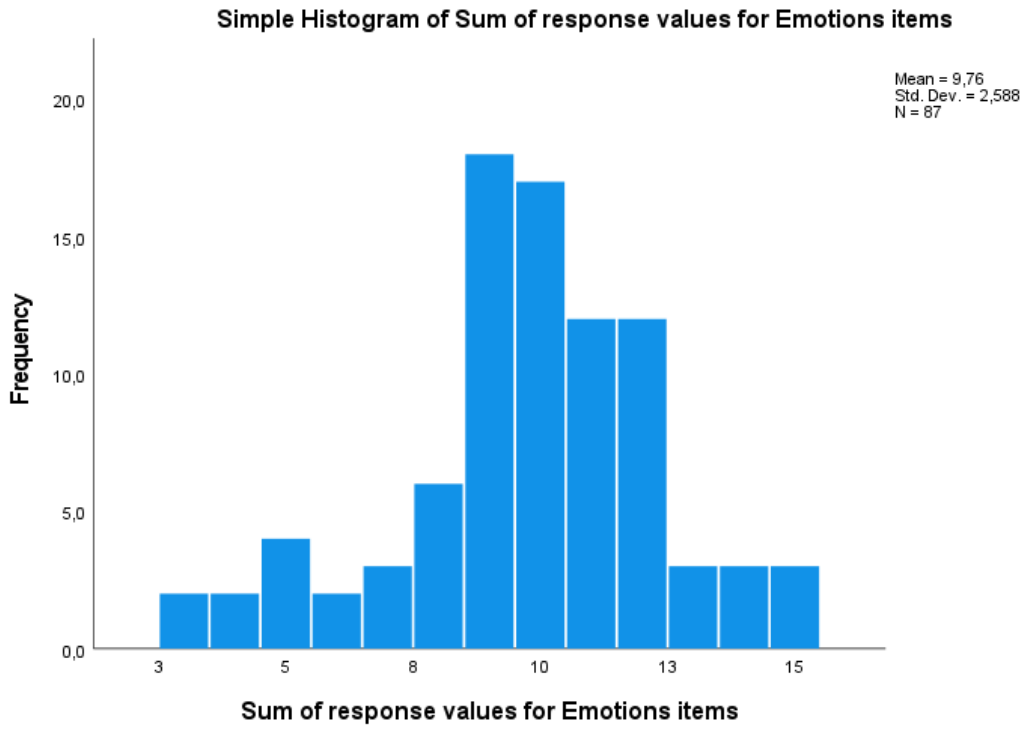
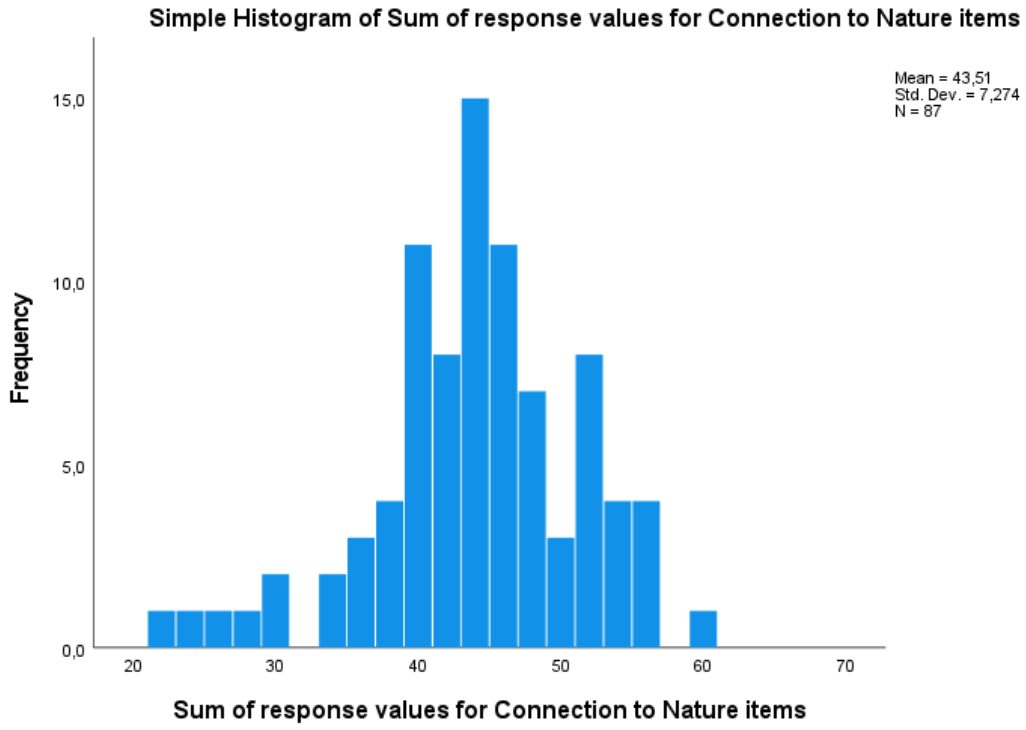
Appendix

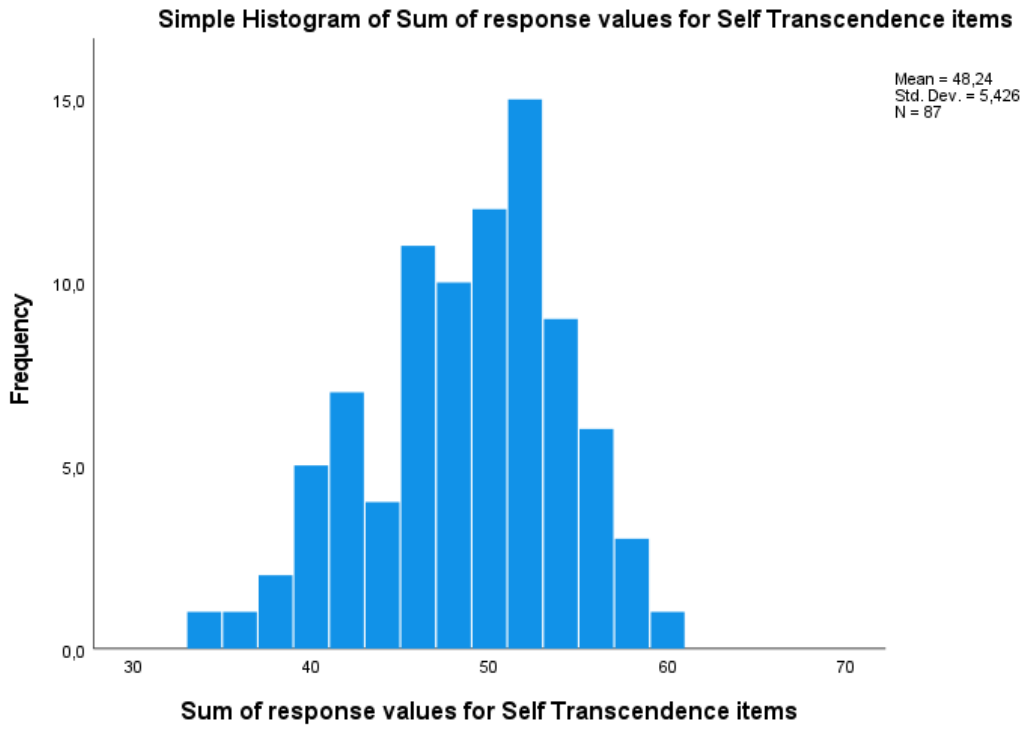
Appendix 1: Histograms of the items






Simple Histogram of Sum of response values for Emotions items
Mean = 9,76
Std. Dev. = 2,588
N = 87
Frequency
20,0
15,0
10,0
5,0
0,0
3
5
8
10
13
15
Sum of response values for Emotions items


Simple Histogram of Sum of response values for Connection to Nature items
Mean = 43,51
Std. Dev. = 7,274
N = 87
Frequency
15,0
10,0
5,0
0,0
20
30
40
50
60
70
Sum of response values for Connection to Nature items



Appendix 2: Informed consent

Dear reader,

Thank you for taking the time to participate in this study.

My name is **Gwen Spilker** and as part of the Master's program Psychology in Business and Economics at Universidade Católica Portuguesa, I aim to study how much our decision-making as consumers can be affected by the relationship we have with our surrounding environments.

In this questionnaire, I am going to ask you to:

(1) Carefully watch a short video

(2) Answer a few questions about the same video (pay attention to the details).

(3) After the video, I would like to ask you about your social - and consumption patterns.

Filling out this questionnaire should not take **more than 8 minutes** of your time and will be a great contribution to my Master's thesis.

To participate in this survey, it is important that **you are in a quiet environment,** and that **your speakers and video are working properly**. If this is not your case, I ask you to come back to the survey when you can.

If you have any questions, remarks, or are interested in the results of the study, please don't hesitate to contact: Gwen Spilker (s-gspilker@ucp.pt).

Thank you again for your participation!

Gwen Spilker

Appendix 3: Emotion scale

Emotions

Please indicate, **as honestly as you can,** to what extent you are experiencing the following emotions after watching the video

	Not all	Not very much	Neutral	A lot	Extremely
Awe	○	○	○	○	○
Gratitude	○	○	○	○	○
Admiration	○	○	○	○	○

Appendix 4: Behavioral intentions scale

Beh. Int.

Please indicate, as honestly as you can, the extend to which each item below describes you. **There are no right or wrong answers.**

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
The next time I go shopping, I will buy sustainable food, if I can find it	○	○	○	○	○
If there are several options available, I will look for sustainable food	○	○	○	○	○
Whenever possible, I will buy food that I consider to be sustainable	○	○	○	○	○

Appendix 5: State Connectedness to nature scale

CNS

Please indicate, as honestly as you can, the way you feel at the present moment. **There are no right or wrong answers.**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Right now I'm feeling a sense of oneness with the natural world around me.	○	○	○	○	○
At the moment, I'm feeling that the natural world is a community to which I belong.	○	○	○	○	○
I presently recognize and appreciate the intelligence of other living organisms.	○	○	○	○	○
At the present moment, I don't feel connected to nature.	○	○	○	○	○
At the moment, I can imagine myself as part of the larger cyclical process of living.	○	○	○	○	○
At this moment, I'm feeling a kinship with animals and plants.	○	○	○	○	○
Right now, I am feeling deeply aware of how my actions affect the natural world.	○	○	○	○	○
Right now, I feel as though I belong to the earth just as much as it belongs to me.	○	○	○	○	○
Presently, I feel like I am part of the web of life.	○	○	○	○	○
Right now, I feel that all inhabitants of earth, human and nonhuman, share a common life force.	○	○	○	○	○
At the moment, I am feeling embedded within the broader natural world, like a tree in the forest.	○	○	○	○	○
When I think of humans' place on earth right now, I consider them to be the most valuable species in nature.	○	○	○	○	○
At this moment, I am feeling like I am only a part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.	○	○	○	○	○

Appendix 6: Self-transcendence scale

STS

Using the following scale, select as honestly as you can what you experience when you answer the question below. **There are no right or wrong answers.**

At this time of my life, I see myself as:

	Not at all	Very little	Somewhat	Very much
Having hobbies or interests I can enjoy.	○	○	○	○
Accepting myself as I grow older.	○	○	○	○
Being involved with other people or my communtiy when possible.	○	○	○	○
Adjusting well to my present life situation.	○	○	○	○
Adjusting to changes in my physical abilities.	○	○	○	○
Sharing my wisdom or experiences with others.	○	○	○	○
Finding meaning in my past experiences.	○	○	○	○
Helping others in some way.	○	○	○	○
Having an ongoing interest in learning.	○	○	○	○
Able to move beyond some things that once seemed so important.	○	○	○	○
Accepting death as a part of life.	○	○	○	○
Finding meaning in my spiritual beliefs.	○	○	○	○
Letting others help me when I may need it.	○	○	○	○
Enjoying my pace of life.	○	○	○	○
Letting go of past regrets.	○	○	○	○

Appendix 7: Personal response efficacy scale

Please indicate, as honestly as you can, the extend to which each item below describes you. **There are no right or wrong answers.**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Environmental problems are partly a consequence of my own behaviors	○	○	○	○	○
My personal behavior can contribute to solving environmental problems	○	○	○	○	○
It makes a difference if I limit the use of natural resources	○	○	○	○	○
By saving energy, I can help solve environmental problems	○	○	○	○	○
Because my behavior can affect the environment, it makes a difference whether I save energy	○	○	○	○	○
By recycling, I can help solve environmental issues	○	○	○	○	○
My recycling behavior can have a positive effect on the environment	○	○	○	○	○