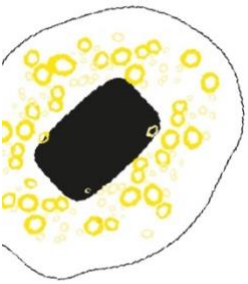

What's in your Cart?

Exploring the effects of awe on sustainable consumption within an online shopping environment.

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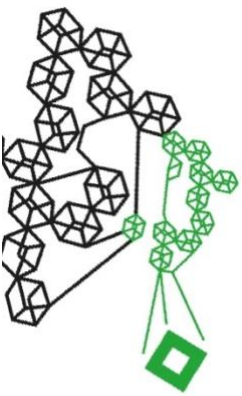

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Abstract

Introduction: Research indicates that human activities are pushing ecological limits, risking irreversible damage. The severity of the consequences of climate change will largely depend on the changes made to anthropogenic activities going forward. Since the food industry is one of the major sources of greenhouse gas emissions, encouraging sustainable consumption habits is essential.

Objective: This research explores the impact of moral and nature-based awe on sustainable consumption and website evaluations, aiming to enhance the understanding of emotions' role in shaping sustainable behaviour.

Methods: In this experimental study, 180 participants completed a survey about their perceptions and experiences after a grocery shopping experiment. Data were analysed using a 3 (Nature-based awe: high-awe scenery, low-awe scenery, or no nature scenery) x 2 (Moral awe: inspiring quote or no inspiring quote) between-subjects design.

Results: The findings of this study highlight the potential of inducing awe within online shopping environments to positively influence sustainable consumption behaviour and shape perceptions of online stores. Particularly, the combination of moral awe (inspiring quote) and high nature-based awe (scenery) demonstrated a significant impact on various dimensions of participants' experiences, encompassing their sense of connectedness, self-perception, perception of the online store, and sustainable consumption behaviour. However, using only moral awe (inspiring quote) without the natural scenery has a counteractive effect.

***Conclusion*:** This study adds valuable insight into the evolving understanding of consumer decision-making in the context of sustainable consumption and online retail, opening doors to designing more effective interventions and strategies for promoting sustainable consumer behaviour in today's world.

Keywords: sustainable consumption, sustainability, awe, incidental emotions, green gap

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1. Introduction

Climate change and global warming are relevant societal issues that cause widespread damaging effects on the world. According to various studies (Vergragt, 2004; Springmann et al., 2018; Crippa et al., 2021), humans are living beyond the ecological limits of the planet. Hence, to potentially counteract irreversible destruction, countries are required to reduce CO2 emission intensity by up to 95% (Vergragt, 2004). Correspondingly, the gravity of the effects of climate change will depend on the adjustments made to future anthropogenic activities. Hence, it is important to investigate and implement interventions that can rapidly reduce greenhouse gas emissions. By doing so, the occurrence of severe climate change might ultimately be prevented.

The environmental impact of the global food system has long been established. In 2015 alone, the food system accounted for approximately 18 Gt of carbon dioxide equivalent (CO2e) greenhouse gas (GHG) emissions, constituting 34% of total global GHG emissions for that year (Crippa et al., 2021). While advancements in technology and reductions in food waste can contribute to mitigating this environmental impact, these measures alone may prove insufficient in addressing the magnitude of the issue (Springmann et al., 2018).

Moreover, numerous studies have consistently identified animal products as the primary contributors to the environmental footprint of our diets. Therefore, transitioning to environmentally sustainable dietary patterns in daily life presents a promising intervention for moderating greenhouse gas emissions.

For instance, eliminating red meat from one's diet reduces global warming potential (Veeramani et al., 2017) and risks concerning chronic conditions like stroke, heart disease, and different types of cancer (Wolk, 2017; Bryant, 2022). Furthermore, research by Hallström et al. (2015) indicates that a simple substitution of meat products with plant-based alternatives can result in a 5% reduction in greenhouse gas emissions and a 15% reduction in land use.

Transitioning to a vegan diet can reduce greenhouse gas emissions by approximately 25% to 55% while cutting land use demand by 50% to 60% (Hallström et al., 2015).

Another way to promote sustainability lies in encouraging eco-conscious purchasing, e.g., organic products, as they contribute significantly lower carbon footprints by minimizing energy consumption and waste production in comparison to conventional farming methods (Stolze et al., 2000; Hansen et al., 2001). Therefore, influencing sustainable purchases (in online settings) may lead to adjustments in one's diet, and has the prospective to effectively reduce CO2 emissions. However, several obstacles, including financial constraints (Sheoran & Kumar, 2020), cognitive barriers (Trudel, 2018), entrenched habits (Leal & Oliveira, 2020), and the convenience of routine behaviours (Jager, 2000), need to be addressed to promote these desirable choices effectively.

While increased ecological knowledge has been associated with engaging in environmentally friendly behaviour (Dispoto, 1977; Balundė, 2019), a significant gap persists between awareness and actual pro-environmental actions (Sultan et al., 2020). As the current global situation is barely close to the set goals to combat global warming, it is interesting to explore the role of emotions as 98% of decision-making takes place unconsciously, automatically, and predominantly based on emotions (Kahneman, 2011).

Awe, a complex emotion, has gained attention in recent studies. Wang et al. (2019) suggest that awe, among generally positive and neutral emotions, can promote sustainable consumption behaviours, in line with Piff et al.'s (2015) findings linking awe with prosocial behaviour. Additionally, awe has been associated with feelings of smallness, an awareness of a greater presence than oneself, and stronger feelings of connectedness with one's environment (Shiota et al., 2006). These effects of awe may potentially establish stronger connections to the environment and shift attitudes towards a more collective and future-oriented mindset, fostering a desire to actively participate in sustainable behaviours.

Furthermore, awe's positive effects, coupled with the strategic use of natural imagery in the digital context, have the potential to enhance website evaluations in terms of consumers' perception and satisfaction with online stores. Nature imagery has been found to elicit positive outcomes in various contexts, such as advertising and health (Schmuck et al., 2018; Twohig-Bennett & Jones, 2018), which suggests its potential effectiveness in the digital realm.

This study employs a 3 (Nature-based awe: high-awe scenery, low-awe scenery, or no nature scenery) x 2 (Moral awe: inspiring quote or no inspiring quote) factorial design to investigate the role of awe in promoting sustainable consumption behaviour and influencing users' website experiences. This design strategically manipulates the presence and intensity of awe-inducing stimulus, particularly nature-based and moral awe, to uncover connections between these emotional experiences and participants' subsequent sustainable consumption choices.

By exploring the potential of awe as a mechanism for promoting sustainable consumption behaviour and enhancing website experiences, this study aims to contribute to the understanding of the role of emotions in shaping sustainable behaviour. Particularly, it investigates whether awe can motivate individuals to engage in more sustainable consumption behaviour—a relatively underexplored area in previous research. The findings may have practical implications for designing interventions aimed at promoting sustainable consumption behaviour, including marketing campaigns and eco-friendly product and website design. The central research question guiding this study is:

RQ: To what extent can the exposure to awe in an online shopping environment influence sustainable consumption behaviours among adults, as well as affect their website experience?

2. Theoretical Framework

2.1. Sustainable consumption

Over the years, consumer awareness and interest in ecological concerns have increased, leading to changes in purchasing decisions related to environmental issues and a willingness to pay higher prices for environmentally friendly products (Mostafa, 2007). As consumers become more aware of environmental issues, their interest in sustainable consumption grows, leading to a deeper exploration of what sustainable consumption entails.

Sustainable consumption encompasses various actions aligned with moral and ethical standards such as justice and fairness (Balderjahn, 2013, p. 199 ff.). It represents a pro-social intention that arises from the combination of self-interest and a sense of social responsibility towards not only fellow individuals but also future generations and the environment. Sustainable consumption behaviour occurs when consumers base their decisions on ecological and social motives rather than self-centred ones (Kirchgässner, 2000, p. 16; 188 ff.).

2.2. Affective decision-making

Although there is a recognised association between environmental knowledge and pro-environmental behaviour, it is important to note that having ecological knowledge does not consistently lead to tangible pro-environmental actions, a phenomenon referred to as the "green gap" (ElHaffar et al., 2020; Sultan et al., 2020).

Researchers have found that incidental emotions, which are emotions normatively irrelevant to present judgments and choices, generally carry over from one situation to another, affecting decisions despite being unrelated to that emotion (Loewenstein & Lerner, 2003). This phenomenon can be influenced by an individual's chronic emotional disposition or immediate surroundings (Bandyopadhyay et al., 2013). Notably, the emotion of awe may play a significant role in encouraging sustainable purchasing decisions in an online shopping environment.

2.3. Awe

Awe is a positive emotional response to stimuli comprising two core appraisals, namely perceptual vastness (e.g., the Grand Canyon, sunsets) and the need for knowledge restructuring as one encounters experiences that do not align with their existing understanding or perception (Keltner & Haidt, 2003). Several studies have found that experiencing awe triggers several physiological and psychological effects, mostly reported as overwhelmingly positive (Yaden et al., 2018). Hence, awe has been shown to have a profound impact on individuals' emotions and cognition.

The self-transcendent nature of awe promotes decreased self-salience and fosters deeper connections with others and the environment (Piff et al., 2015; Yaden et al., 2017). Moreover, high levels of awe redirect individuals' focus toward the needs of others, thereby strengthening ecological and social bonds (Bai et al., 2017; Shiota et al., 2017), eventually motivating more sustainable behaviours. Essentially, self-transcendence correlates positively with environmental attitudes, underscoring the significance of concern for others' well-being (Follows and Jobber, 2000). Environmentalists have suggested that awe plays a vital, and possibly fundamental, role in shaping our moral perspective regarding the natural environment (McShane, 2018).

2.3.1. Elicitors of awe

Various studies have identified awe-inducing experiences, with some stimuli more commonly triggering awe than others. These triggers encompass nature, art, music, and spiritual or religious encounters, with nature-based awe being the most prevalent (Yaden et al., 2018).

In a study conducted by Cohen et al. (2010), participants recalled moments when they experienced profound beauty. The study found that the majority (55%) of these beauty experiences were associated with nature. Additionally, participants reported a high level of

awe, with an average rating of 4.5 on a 1 to 5 scale during these encounters (Cohen et al., 2010), suggesting that nature is the primary source of awe-inspiring experiences.

Furthermore, Zhao et al. (2018) discovered that individuals in China displayed an increased commitment to pro-environmental actions and prioritized environmental concerns after briefly experiencing awe, particularly when encountering natural scenes. Similarly, Wang et al. (2019) suggest that the experience of awe can influence green consumption behaviours by fostering a stronger psychological connection to nature. This notion implies that when individuals experience awe, they tend to develop a deeper sense of ownership and connection to the natural world.

In addition to nature, moral awe can also have an awe-inducing impact on individuals (Keltner, 2023a). According to Keltner (Keltner et al., 2023b), "over 95% of the moral beauty that stirred awe worldwide was in actions people took on behalf of others." Consequently, humans are most likely to experience awe when moved by moral beauty. In a daily diary study conducted by Bai et al. (2017), they found that other people's actions were most likely to trigger everyday awe, which resulted in an increase in collective engagement.

Furthermore, inducing feelings of awe through both nature-based (nature video clip) and social stimuli (childbirth video clip) had a comparable impact on participants' pro-environmental intentions, suggesting that the influence of awe on environmental consciousness extends beyond extraordinary natural settings (Zhao et al., 2018).

In conclusion, nature and moral beauty are two of the most influential antecedents of awe. Based on the theoretical framework presented, the experience of awe can transform individual attitudes and behaviours toward sustainability. Consequently, this research primarily centres on the influence of emotions on decision-making, specifically, the impact of incidental experiences of awe, triggered by various stimuli, on individuals' tendency to make eco-friendly choices when shopping online is examined. This study aims to understand the emotional and

moral dimensions of sustainability, which can be more effective than merely relying on solely cognitive approaches. This study suggests that this relationship may extend to sustainable consumption and environmentalism in general. Hence, the current study suggests that:

H1a: Sustainable consumption choices are more pronounced in the high nature-based awe conditions as opposed to the low nature-based awe conditions.

H1b: Participants' sustainable consumption choices are more pronounced in the conditions in which participants are exposed to moral awe (inspiring quote) as opposed to not having the exposure.

H1c: There is a positive correlation between participants' a) general sustainable attitudes, b) explicit sustainable purchase choices (choices made in the survey), and their actual sustainable choices (choices made in the experiment).

Additionally, the current study addresses the sub-question:

SQ: Which of the awe antecedents (nature-based vs. moral) is most effective in the context of promoting sustainable purchases?

2.4. Website experience

Awe is an overwhelmingly positive emotion that generates feelings of joy, happiness, and connectedness (Yaden et al., 2018). Considering the profoundly positive impact of awe on individuals, it is likely that this positive emotion may extend to their evaluation of websites. This emotional carryover may lead individuals to perceive websites more favourably, for instance, they may find them visually appealing, engaging, and memorable. Hence, when users experience awe while interacting with a website, it may create a positive emotional association with the content, leading to a more positive overall user experience.

Moreover, the present study makes use of nature imagery as part of biophilic design, a concept gaining traction in environmental psychology, marketing, and health research. Biophilia is characterised as direct or indirect experiences of nature, including environmental

stimuli like plants, water, natural light, and natural colours (Kellert & Wilson, 1993). Biophilic design is rooted in the inherited inclination of individuals to affiliate with nature, which implies the love for all that is alive (Kellert & Wilson, 1993). Several studies suggest that biophilic retail environments trigger favourable attitudes and behaviours among customers. Purani and Kumar (2018) found that customers experience positive attention restoration, perceived place identity, and servicescape preference because of the indirect nature experience in servicescape designs. Similarly, incorporating nature imagery in print advertising has been shown to enhance consumer attitudes towards brands (Schmuck et al., 2018).

Moreover, in a hotel setting, Lee and Chuang (2022) suggest that green atmospheres are considered a technique for improving customers' positive experiences and favourable behaviours. Hence, nature imagery evoking feelings of tranquillity and connectedness to the environment may contribute to a more favourable perception of the website and an increased sense of satisfaction among consumers.

Furthermore, it is arguable that biophilic design aligns with sustainability principles by bringing nature into the built environment, which may influence a store's sustainable image.

All in all, this study proposed that:

H3a: Participants' website evaluations are more positive in the high nature-based awe conditions as opposed to the low nature-based awe conditions.

H3b: Participants' website evaluations are more positive in the conditions in which participants are exposed to moral awe (inspiring quote) as opposed to not having the exposure.

H4: The website's biophilic design positively influenced the store's sustainable image.

Furthermore, an additional sub-question addressed in the current study is:

SQ2: Which of the awe antecedents (nature-based vs. moral) is most effective in the context of promoting positive online store perceptions and satisfaction?

3. Methods

3.1. Design

Data were analysed using a 3 (Nature-based awe: high-awe scenery, low-awe scenery, or no nature scenery) x 2 (Moral awe: inspiring quote or no inspiring quote) between-subjects design.

3.2. Pre-test: 1. sustainable product perception and 2. awe intensity perception

To determine participants' sustainability perceptions of various grocery products, as well as the intensity of different awe-inspiring videos (nature-based awe) and inspiring quotes (moral awe), two pre-tests were conducted prior to the actual experiment. There was a total of 15 participants for each pre-test that were reached through convenience sampling. The first pre-test evaluated the sustainability perceptions of 52 grocery products on a scale from 1 (not eco-friendly) to 5 (very eco-friendly). In pre-test 2, participants were asked to rate ten nature scenes and eight inspiring quotes based on how awe-inspiring they perceived them (0 = not at all awe-inspiring, 7 = highly awe-inspiring) while watching the stimuli.

3.2.1. Pre-tests results

Pre-test 1 results aligned with Steenis et al.'s findings (2008), showing that material choice strongly influenced perceived sustainability. Similarly, participants tended to view plastic as the least sustainable and cartons/paper materials as the most sustainable. Moreover, cool and natural colours like green were associated with sustainability. Hence, products with paper-like packaging in such colours were perceived as the most sustainable.

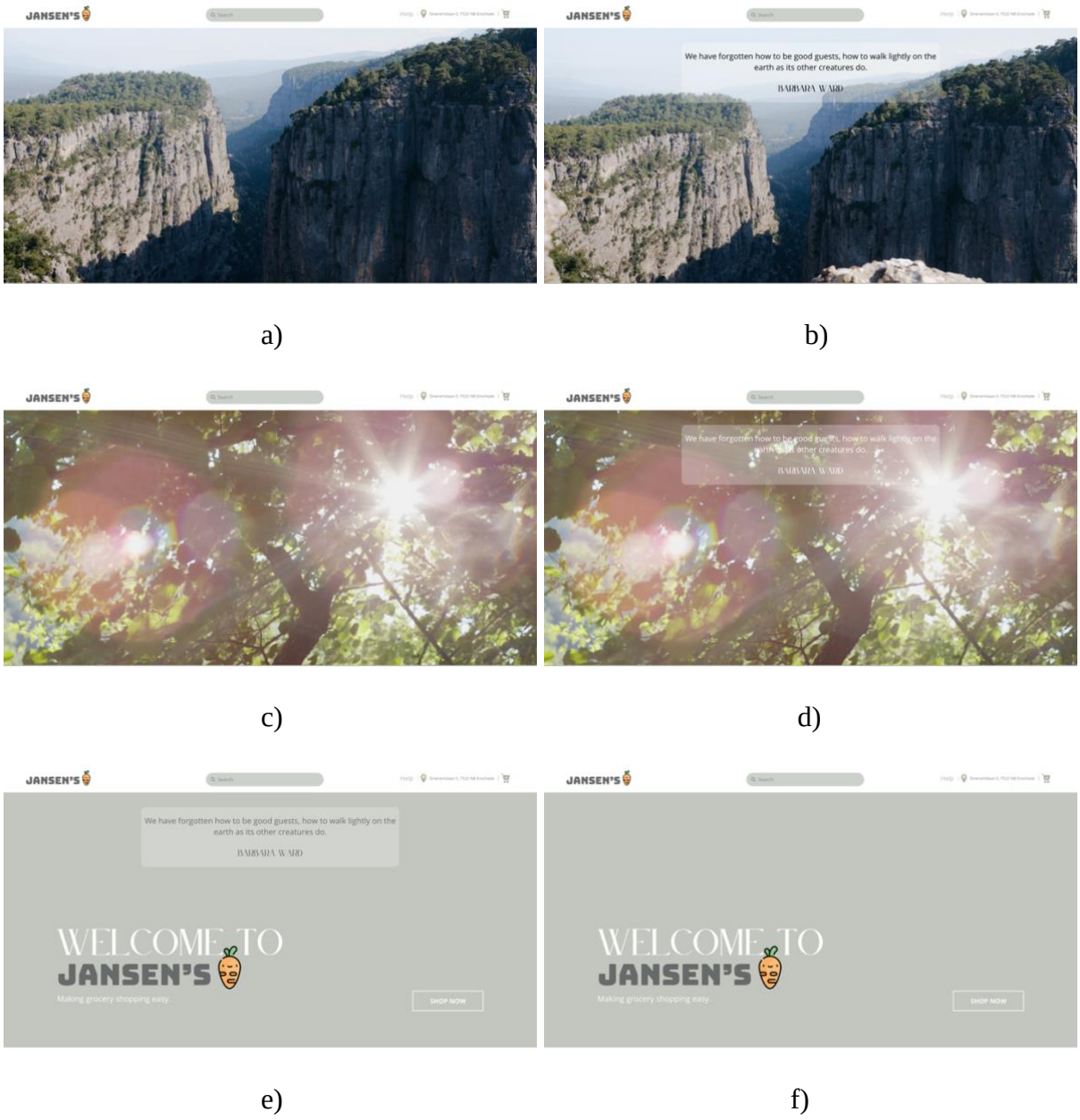
In Pre-test 2, vastness emerged as a significant trigger of awe. Participants found vast nature scenes more awe-inspiring than dense ones. Moreover, the quote rated as most awe-inspiring is *"We have forgotten how to be good guests, how to walk lightly on the earth as its other creatures do." — Barbara Ward.*

Based on these findings, the final stimuli of the experimental study were created (see Figure 1). Complete results for both pre-tests can be found in Appendix A and B.

A desktop interface was chosen for its larger format, facilitating a better presentation of design elements. The full layout of all the websites and the corresponding links can be found in Appendix C.

Figure 1

Different conditions in an online shopping environment



a) b)

c) d)

e) f)

Note. a) high nature-based awe condition, b) high nature-based awe and moral awe condition, c) low nature-based awe condition, d) low nature-based awe and moral awe condition, e) moral awe condition, f) control condition

3.3. Procedure

The Ethics Committee at the University of Twente granted ethical approval for this study (Request no: 230893). The data collection method used in this study was an online quantitative self-reported questionnaire concerning the participants' perceptions and experiences after the grocery shopping experiment. The questionnaire was distributed through convenience sampling as it was sent out via Social Media platforms such as WhatsApp, Instagram, LinkedIn, and Facebook.

Initially, before the data collection began, participants were given a brief explanation of the study and the structure of the experiment. Participants were required to give their consent for participation. However, to minimise potential biases the complete nature of the study was intentionally withheld until the conclusion of the survey, at which point participants were re-sought for their consent.

Primarily, participants were given a scenario and a task (see Appendix D) to choose a maximum of 10 grocery items from a website entailing 24 grocery items, with prices corresponding to reality; however, products of the same type had the same pricing point. This was done to prevent the influence of price discrepancies on the results, thus, enabling a focus on other factors like awe. These products were either eco-friendly, plant-based, or not, with the former two being eco-friendly options. Overall, there were an equal number of choices available for both sustainable (plant-based or eco-friendly) and unsustainable options.

Following the experiment, participants completed a post-experiment questionnaire covering their sustainable purchase choices, general sustainable attitudes, awe experiences, and website perceptions, including online store perceptions and satisfaction.

3.4. Participants

There was a total of 271 respondents, however, in the end, there were 180 valid responses as some had to be deleted due to the withdrawal of prior consent (2) and because of incomplete responses (92), possibly because the survey could only be accessed through a laptop or desktop.

Of the 180 survey respondents, 45.0% identified as Male, 53.9% as Female, and 1.1% as Non-binary/Third gender. Moreover, the sample consists of a diverse range of nationalities, with "German" being the most common response with a total of 78 participants (43.3% of the sample) identifying as such. Other prominent nationalities included "Dutch" (52 participants, 28.9%), "French" (9 participants, 5.0%), and "Spanish" (5 participants, 2.8%). The remaining responses represented various nationalities, each constituting less than 2% of the sample.

The age distribution encompasses a range from 18 to 58 with most respondents falling within the age range of 22 to 27, accounting for 35.6% of the sample. Specifically, the age of 23 holds the highest frequency, representing 20.6% of the participants, closely followed by ages 22 (11.7%) and 25 (11.1%), showing that the majority of participants fall within their early to late twenties.

Among the 180 participants, their highest level of education is distributed as follows: approximately one-third (33.9%) indicated completing high school or similar, nearly half (47.8%) have attained a bachelor's degree, and around 9.4% hold a master's degree. A smaller proportion, about 3.3%, possesses a PhD, and the remaining 5.6% have completed an apprenticeship. As illustrated in Table 1, the number of responses is equally split between the six different conditions.

Table 1

Condition Distribution

Condition	N	%
High nature-based awe	30	16.7

High nature-based awe and moral awe	30	16.7
Low nature-based awe	30	16.7
Low nature-based awe and moral awe	30	16.7
Control	30	16.7
Moral awe	30	16.7
Total	180	100.0

3.5. Measurement

The questionnaire can be found in Appendix E. All variables (excl. *Sustainable Consumption Behaviour*) applied for this study are validated scales retrieved from previous research.

3.5.1. Sustainable consumption behaviour

To measure the sustainable consumption behaviour variable, participants of the experiment were asked to purchase 10 grocery items in an online store. Thus, the number of sustainable (plant-based/organic) products they purchase ranges from 1-10. Subsequently, a total score is calculated, which should show their sustainable purchase behaviour. Higher scores relate to a more sustainable consumption behaviour and vice versa.

3.5.2. Explicit purchase choices and general sustainable attitudes

The Ethically Minded Consumer Behaviour Scale (Sudbury-Riley & Kohlbacher, 2016) was modified to assess participants' explicit purchase choices (survey responses) and general sustainable attitudes to compare them with their sustainable consumption behaviour (experiment choices). The modified scale measuring explicit purchase choices consists of items such as "I have switched products for environmental reasons." and "I chose products that contributes to the least amount of environmental damage."(Cronbach's $\alpha = .882$), while the modified scale concerning general sustainable attitudes includes "If I understand the potential damage to the environment that some products can cause, I do not purchase those products"

and "whenever possible, I buy products that contributes to the least amount of environmental damage." (Cronbach's α = .840).

3.5.3. Awe

Although the intensity of awe exposure was assessed during the pre-test, participants' feelings of awe will also be measured using the Awe Experience Scale (AWE-S) developed by Yaden et al. (2018). Typically, the AWE-S comprises 30 items, with five items per factor. However, for this study, only five items (one factor) will be included: Connectedness (Cronbach's α = .941). This factor aligns best with the context of the actual experiment. Sample items from the AWE-S scale include statements like "I had the sense of being connected to everything."

The factor of diminished self is substituted with a more visual scale (Figure 2), which is adapted from Bai and her colleague's (2017) method of measuring the small self. The scale is composed of a series of illustrations of different-sized people in comparison to the sun. The participants are asked which depiction they associate themselves with the most at the current moment, with low scores indicating participants perceive a smaller sense of self and vice versa (Bai et al., 2017).

Figure 2

The small self

Note. Adopted from *Awe, the diminished self, and collective engagement: Universals and cultural variations in the small self*, by Bai et al., 2017.

Moreover, an additional visual scale to measure connectedness, specifically, the Inclusion of Community in Self scale (ICS) by Mashek et al. (2007), is included as an item.

This scale portrays six pairs of circles that range from completely separated to almost completely united. The single-item scale can be viewed in Figure 3.

Figure 3

Inclusion of Community in Self scale (Mashek et al.,2007)

Note. Adopted from *Inclusion of Community in self scale: A single-item pictorial measure of community connectedness*, by Mashek et al., 2007.

3.5.4. Website evaluation

To measure online store perception, four items measuring design factors identified by Baker et al. (1994) were modified and used to suit the online grocery context. For example, items read, "the online grocery store has an attractive character" and "the colour schemes of this online grocery store are attractive". Moreover, Satisfaction was measured with four 7-point Likert-format items by Eroglu et al. (2003), including items such as "I enjoyed visiting the site" and "I was satisfied with my shopping experience at the site".

The rotated component matrix indicated that by removing one item measuring 'Online Store Perception' and another measuring 'Satisfaction' reliable scales with a Cronbach's alpha of α = .821 and α = .840 were formed.

An additional and straightforward question was incorporated to explore the potential influence of the biophilic design on the store's sustainability image: "The online grocery store is eco-friendly."

3.5.5. Quality of Instruments

Reliability analyses of the utilised constructs were conducted to confirm the sufficient quality of the results. Hence, Cronbach's alpha was measured for every scale. The results show

that all constructs have sufficient reliability and validity. The item and their scores can be found below in Table 2.

Table 2

Constructs and Cronbach's Alpha

Constructs	Items	Cronbach's Alpha
Explicit Purchase Choices	I have switched products for environmental reasons.	.882
	I chose products that contribute to the least amount of environmental damage.	
	I chose products that do not harm the environment.	
	I chose products packaged in reusable or recyclable containers.	
Prior Sustainable Attitude	If I understand the potential damage to the environment that some products can cause, I do not purchase those products.	.840
	Whenever possible, I buy products that contribute to the least amount of environmental damage.	
	Whenever possible, I buy products packaged in reusable or recyclable containers.	
	I have paid more for environmentally friendly products when there is a cheaper alternative.	
	I will not buy a product if I know that the company that sells it is socially irresponsible.	
	I have paid more for socially responsible products even though there are cheaper alternatives.	
Connectedness	I had the sense of being connected to everything.	.941
	I felt a sense of communion with all living things.	
	I experienced a sense of oneness with all things.	
	I felt closely connected to humanity.	
	I had a sense of complete connectedness.	
Online Store Perception	The online grocery store has an attractive character.	.821
	The overall design of this online grocery store is interesting.	

	The colour schemes of this online grocery store are attractive.	
Satisfaction	I enjoyed visiting the site.	.840
	I was satisfied with my shopping experience at the site.	
	I would recommend the site to other people.	

4. Results

4.1. Sustainable consumption behaviour

A chi-square test of independence was performed to examine the relation between the different conditions and sustainable consumption behaviours. The results revealed that there was a significant association between the conditions and sustainable consumption behaviour, $\chi^2(2) = 6.263$, $p = .044$. This indicates that the choice of conditions had a statistically significant impact on whether individuals engaged in sustainable consumption behaviour. An overview of participants' sustainable consumption behaviour per condition can be found in Table 3 and Appendix E.

Table 3

*Crosstabulation: Sustainable consumption * Conditions*

		Control	Nature-based Awe OR Moral Awe	Nature-based Awe AND Moral Awe	Total
Sustainable Consumption Behaviour	Organic	17	50	45	112
	Non-Organic	13	40	15	68
Total		30	90	60	180

4.2. Explicit purchase choices and general sustainable attitudes

The multifactorial analysis of variance (ANOVA) results showed that neither moral awe ($F(1, 174) = 0.350$, $p = .556$) nor nature awe ($F(2, 174) = 0.248$, $p = .781$) had statistically

significant main effects on explicit purchase choices. Additionally, the interaction effect between moral awe and nature awe ($F(2, 174) = 0.531$, $p = .590$) did not significantly impact participants' purchase choices.

However, there was a significant main effect of general sustainable attitude ($F(33, 174) = 2.782$, $p < .001$) on explicit purchase choices, indicating that pre-existing attitudes toward sustainability played a substantial role in shaping participants' choices in the survey.

4.3. Awe

4.3.1. Connectedness

The ANOVA results revealed that the main effects of nature-based awe ($F (2, 174) = 2.039$, $p = .133$) and moral awe ($F (1, 174) = 1.705$, $p = .193$) were not statistically significant. However, the interaction between moral awe and nature-based awe significantly influenced connectedness ($F (2, 174) = 5.109$, $p = .007$). Post hoc analysis indicated a significant difference between participants in the combined high nature-based awe and moral awe condition and those in the moral condition ($p = .012$). There was also a marginally significant difference in the combined low nature-based awe and moral awe condition compared to the moral condition ($p = .057$). This suggests that the combination of nature-based awe and moral awe led to significantly higher feelings of connectedness compared to moral awe alone.

Participants reported the highest level of connection to their environment in two specific conditions: the combined high nature-based awe and moral quote condition ($M = 4.35$, $SD = .252$) and the combined low nature-based awe and moral quote condition ($M = 4.18$, $SD = .252$). Conversely, participants in the moral quote condition alone ($M = 3.13$, $SD = .252$) felt the least connected during the shopping experience.

Notably, no significant differences in the sense of connectedness were found among the other website conditions: the low nature-based awe condition ($M = 3.56$, $SD = .252$), the high

nature-based awe condition (M = 3.51, SD = .252), and the control condition (M = 3.79, SD = .252).

4.3.2. Visual connectedness scale

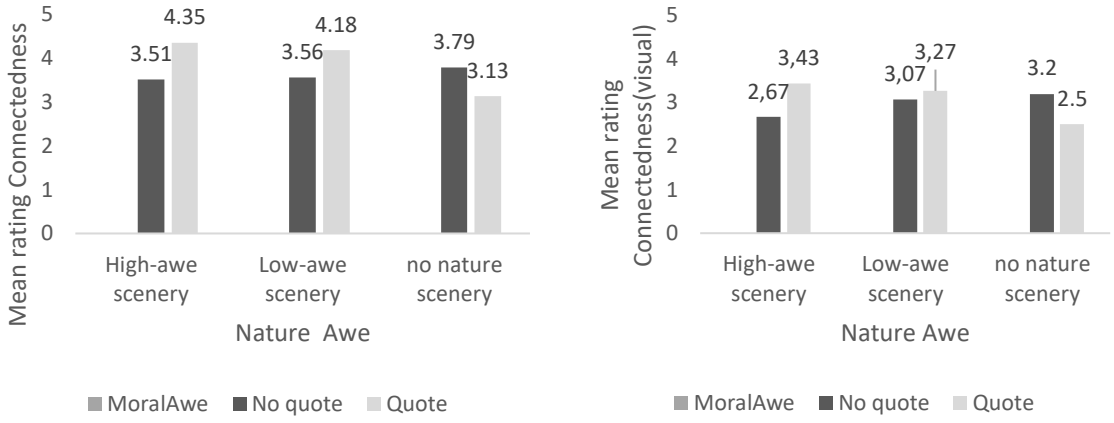
For the Visual Connectedness Scale, the analysis showed that neither moral awe (F (1, 174) = .234, p = .629) nor nature-based awe (F (2, 174) = 1.014, p = .365) had a significant main effect on connectedness with the community during the website and shopping experience. However, the interaction of moral awe and nature-based awe did have a significant effect (F (2, 174) = 5.407, p = .005). Participants in the combined high nature-based awe and moral awe condition reported significantly higher connectedness compared to those in the moral condition, with a marginally significant result (p = .057). Thus, when both moral awe and high nature-based awe were present, they had a stronger impact on connectedness, highlighting the effectiveness of an inspiring quote on the website.

A similar pattern of results, consistent with the previous connectedness scale, emerged among participants in both the combined high nature-based awe and moral quote condition (M = 3.43, SD = 0.225) and the combined low nature-based awe and moral awe condition (M = 3.27, SD = 0.225), indicating that they reported feeling the most connected to the community at large. In contrast, participants in the moral quote condition alone (M = 2.50, SD = 0.225) felt the least connection with the community.

Furthermore, no significant differences in the sense of connectedness were observed among the other website conditions: the low nature-based awe condition (M = 3.07, SD = 0.252), the high nature-based awe condition (M = 2.67, SD = 0.252), and the control condition (M = 3.20, SD = 0.252). Figure 4 illustrates the varying levels of a) connectedness and b) connectedness as measured on a visual scale among these conditions.

Figure 4

Estimated marginal means of the different levels of a) connectedness and b) connectedness as measured on a visual scale among the conditions.



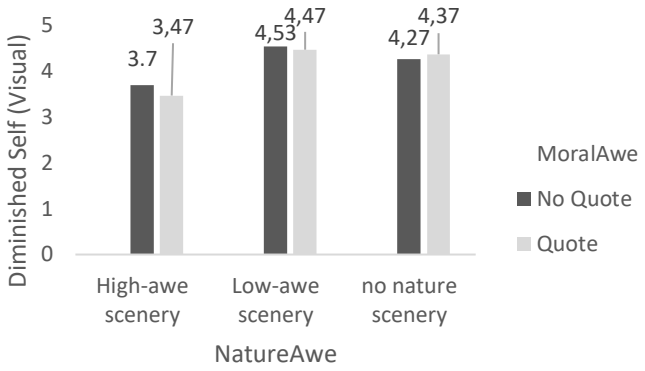
4.3.3. Diminished self (visual scale)

Regarding participants' sense of self during shopping, nature-based awe significantly influenced their self-perception ($F (2, 174) = 8.092$, $p < .001$). Specifically, participants reported feeling the largest (closer to 7) in the low nature-based awe condition ($M= 4.53$, $SD= .241$), followed by the combined low nature-based and moral awe condition ($M=4.47$, $SD=.241$), the no nature scenery condition ($M= 4.27$, $SD= .241$), the moral awe condition ($M=4.37$, $SD=.241$), and the high nature-based awe condition ($M= 3.70$, $SD= .241$). Participants felt the smallest in the combined high nature-based awe and moral awe condition ($M=3.47$, $SD=.241$). However, moral awe alone did not significantly affect participants' self-perception ($F (1, 174) = .115$, $p = .735$).

The interaction of moral awe and nature awe also did not significantly affect self-perception ($F (2, 174) = .239$, $p = .788$). Figure 5 illustrates the different levels of diminished self among the conditions.

Figure 5

Estimated marginal means of diminished self among the conditions.



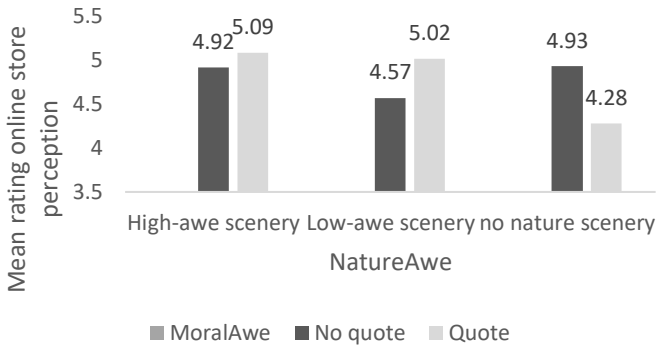
4.4. Online store perception

The ANOVA results revealed that the main effects of neither nature-based awe (F (2, 174) = 2.021, p = .136) nor moral awe (F (1, 174) = .005, p = .945) had a significant effect on participants' perceptions of the online store. However, there was a statistically significant interaction effect between moral awe and nature-based awe (F (2, 174) = 4.234, p = .016). Post hoc analysis revealed that participants in the combined high nature-based awe and moral awe condition reported more enhanced online store perceptions compared to those in the moral condition, with a marginally significant result (p = 0.063).

Participants in both the combined high nature-based awe and moral awe conditions (M= 5.09, SD= .198) held more positive perceptions of the store, whereas those in the moral quote condition (M= 4.28, SD= .198) reported the lowest levels of positive store perception. Importantly, no significant differences in the sense of connectedness were found among the other website conditions: the low nature-based awe and moral awe conditions (M= 5.02, SD= .198), the low nature-based awe condition (M = 4.57, SD = .198), the high nature-based awe condition (M = 4.92, SD = .198), and the control condition (M = 4.93, SD = .198). Figure 6 illustrates the different levels of online store perception among the conditions.

Figure 6

Estimated marginal means of online store perception among the conditions.

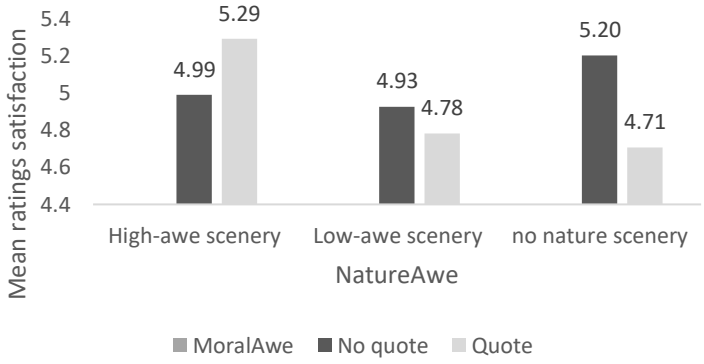


4.5. Satisfaction

The ANOVA results revealed that neither nature-based awe ($F(2, 174) = 0.102$, $p = .903$) nor moral awe ($F(1, 174) = 0.042$, $p = .837$) had a significant effect on participants' satisfaction with the online store. These findings indicate that these variables did not independently influence participants' levels of satisfaction. Furthermore, the interaction between nature-based awe and moral awe also did not reach significance ($F(2, 174) = 2.087$, $p = .127$), suggesting that the combined impact of these variables did not significantly affect participants' satisfaction. Figure 7 illustrates the different levels of satisfaction among the conditions.

Figure 7

Estimated marginal means of satisfaction among the conditions.



4.6. Additional Findings

4.6.1. Sustainability perception

The ANOVA results revealed no statistically significant main effect for nature awe ($F(2, 174) = 1.149$, $p = .319$) or moral awe ($F(1, 174) = 0.218$, $p = .641$) on participants' sustainability perceptions of the website. However, there is a statistically significant interaction effect between moral awe and nature awe ($F(2, 174) = 3.298$, $p = .039$).

Subsequent post hoc comparisons demonstrated no significant differences in participants' perceptions of website sustainability across different conditions ($p > .05$ for all comparisons). In summary, while an interaction effect was found between moral awe and nature awe, it did not result in notable differences in participants' perceptions of website sustainability.

4.6.2. Correlation: sustainable consumption behaviour, explicit purchase choices, general sustainable attitude

A correlation analysis was conducted to examine the relationship between three variables: sustainable consumption behaviour, general sustainable attitude, and explicit purchase choices.

The results indicate a strong negative correlation between participants' explicit purchase choices during the experiment and their sustainable consumption behaviour ($r = -0.478$, $p < 0.001$), indicating that participants who reported more positive explicit purchase choices in the survey tended to make fewer sustainable choices during the shopping experiment. This suggests a potential conflict between consumers' preferences and their sustainable choices.

Additionally, there is a strong positive correlation between explicit purchase choices and general sustainable attitude ($r = 0.589$, $p < 0.001$). This suggests that participants with a more favourable prior sustainable attitude tended to make more positive explicit purchase choices in the survey, aligning their explicit choices with their general attitudes.

Moreover, there is also a strong negative correlation between sustainable consumption behaviour and general sustainable attitude ($r = -0.464$, $p < 0.001$), implying that individuals with more favourable pre-existing sustainable attitudes tended to engage in fewer sustainable

choices during the shopping task. This highlights the notion that possessing a positive attitude toward sustainability does not consistently result in making sustainable choices.

5. Discussion

The findings of this study highlight the potential of inducing awe within online shopping environments to positively influence sustainable consumption behaviour and shape perceptions of online stores. Particularly, the combination of moral awe and high nature-based awe demonstrated a significant impact on various dimensions of participants' experiences, encompassing their sense of connectedness, self-perception, perception of the online store, and sustainable consumption behaviour.

Participants exposed to both moral awe and high nature-based awe scenery reported a heightened sense of connectedness to their surroundings. This emotional connection aligns with the idea that awe fosters deeper connections with others and the natural world, as suggested by Piff et al. (2015). Additionally, the presence or absence of awe-inducing natural scenery significantly influenced participants' self-perception during their shopping experience. Participants in conditions with low levels of nature-based awe reported higher levels of self-perception, whereas those in conditions with high nature-based awe experienced a reduced sense of self. This highlights how awe-inducing environments can restructure participants' self-concept, consistent with prior research (Shiota et al., 2017).

Furthermore, the combination of moral awe and high nature-based awe scenery may collaboratively enhance the overall sense of awe. This heightened awe fosters a deeper connection between individuals and their surroundings, subsequently influencing their self-perception and, ultimately, promoting sustainable consumption behaviour. These insights are in line with the conclusions of Zhao et al. (2018), who propose that the reduction of social dominance orientation may partially account for the relationship between awe and environmentalism. Similarly, the interplay between connectedness and diminished self, both

components of an awe experience, plays a role in fostering self-transcendence (Yaden et al., 2017). This sense of self-transcendence, stemming from the deep emotional reactions evoked by awe, could have had a beneficial impact on sustainable consumption behaviour. This aligns with the established connection between self-transcendence and environmentalism, as noted in prior research (Follows and Jobber, 2000).

However, when only the inspiring quote (moral awe) was incorporated as a design element, there appears to be a reversal of this pattern. For instance, participants exposed to the moral awe element alone reported feeling the least connected, felt relatively larger in terms of self-perception, and reported the lowest levels of positive store perception and sustainable consumption behaviour during the shopping experience. This suggests that the presence of an inspiring quote alone, without high nature-based awe scenery, may become meaningless and not have the same positive influence on individuals' perceptions and behaviours in the context of sustainable consumption. The absence of the visual awe factor of the nature scene may make the quote seem less powerful and effective as the nature-based awe scenery provides a tangible, sensory experience that people can connect with on several levels, such as visually and emotionally. Moreover, there may be a level of cognitive dissonance involved when participants experience a disconnect between their expectations created by the inspiring quote and their actual experiences, which points towards a promising direction for future research.

Additionally, participants' general sustainable attitudes, sustainable consumption behaviour, and explicit purchase choices significantly influenced their behaviours in the study. Surprisingly, those who reported more positive purchase choices in the survey tended to make fewer sustainable choices during the shopping experiment. Similarly, individuals with more favourable pre-existing sustainable attitudes also engaged in fewer sustainable choices during the experiment. This reveals a striking contradiction between consumers' stated preferences and their actual sustainable choices, implying a disconnect between what individuals express

as their preferences (as indicated by their explicit choices) and how they behave concerning sustainability. This discrepancy underscores the existence of the "green gap" phenomenon (ElHaffar et al., 2020; Sultan et al., 2020).

Furthermore, the study's results suggest that the combination of moral awe and high nature-based awe has the potential to positively impact online shopping environment perceptions and influence participants' views on product and service sustainability. Although these findings did not reach conventional levels of significance, they indicate a trend consistent with the hypothesis that specific conditions can enhance online store perceptions, offering a promising direction for future research.

5.1. Practical Implications

The implications of these findings extend to various stakeholders, including marketers, environmental organizations, and educators.

In design, the integration of awe-inducing elements, such as immersive visuals, inspiring quotes, or nature-based themes, can enhance user perceptions of platforms and products. Showcasing the awe-inspiring beauty of natural landscapes can possibly foster a deeper connection with the environment and encourage individuals to adopt more sustainable behaviours (Zhao et al., 2018). Thus, marketers can use awe-inducing experiences as a channel for conveying sustainability messages. When individuals are in a state of awe, they may be more receptive to information about sustainability and environmental responsibility.

Furthermore, marketers can leverage the power of awe-inducing content and experiences in their campaigns to promote sustainable products and behaviours as incorporating awe-inspiring imagery and narratives in advertisements and branding can enhance consumers' emotional engagement (Schmuck et al., 2018; Lee & Chuang, 2022) and potentially drive them towards more sustainable choices. As the findings suggest that awe-inducing experiences may potentially influence individuals' perceptions of the environmental

friendliness of products and services, companies aiming to promote their sustainability initiatives may benefit from incorporating awe-inducing elements into their marketing and product presentations.

Moreover, in educational contexts, institutions can integrate awe-inducing experiences into sustainability education programs. Field trips to natural wonders or immersive multimedia presentations can help students develop a deeper connection and profound appreciation for the environment, eventually motivating them to make sustainable choices both in the present and in the future.

However, the intriguing reversal in the pattern underscores the complexity of design elements and their interactions within online shopping environments. It suggests that the combination of different elements can lead to diverse outcomes, and the effectiveness of specific design choices may vary depending on the context and objectives of the online shopping experience. Marketers and designers may need to carefully consider the combinations of elements they incorporate to achieve the desired impact on consumers' perceptions and behaviours, particularly in the realm of sustainability.

5.2. Limitations and Recommendations for Future Research

Despite awe being generally regarded positively in aesthetics, psychology, and environmental ethics, concerns about its potential for manipulation and its impact on democratic and equal social relations have arisen in ethics and political philosophy (McShane, 2018), for instance, it may raise concerns about potential greenwashing. Hence, Ethical considerations stand out as a prominent limitation in studies involving emotional manipulation, such as inducing awe to observe its effects. There could be concerns about the extent to which participants' emotions were manipulated, as well as the potential impact on their psychological well-being. As mentioned, two participants decided to withdraw their prior consent to the study after finding out the true nature of the study, indicating that although the study evokes positive

emotions, participants may still feel manipulated. To address these ethical concerns, it is essential to establish robust measures for informed consent, and debriefing and prioritize participants' emotional well-being to uphold the integrity of such studies.

The nature of the study, which involved simulated online shopping experiences rather than real shopping, may raise questions about its generalizability to real-world shopping scenarios. For instance, controlling for price may be useful for research purposes, but it may not reflect real-world scenarios where prices can vary significantly, which in turn can limit the external validity or generalizability of the findings to situations where prices do vary. Additionally, it is worth noting that price is a significant barrier for some individuals when it comes to purchasing sustainable products (Sheoran & Kumar, 2020). High prices of eco-friendly items can discourage consumers from making sustainable choices, highlighting the importance of considering price sensitivity in sustainable consumption behaviour studies.

Moreover, the study's focus on the short-term effects of awe raises the question of whether the observed outcomes can be inferred to long-term sustainable consumption behaviours. While the current study shed light on the immediate impact of awe-inducing stimuli, the study's design did not fully capture the potential evolution of choices over a more extended period, leaving the lasting influence of awe on ongoing sustainable commitments unexplored. It could be interesting to delve into the progression of how individuals' feelings of awe evolve and the subsequent impacts this evolution might have on sustainable consumption behaviours.

Furthermore, considering that the study highlighted the importance of awe intensity as a significant factor, it is plausible that awe intensity may increase over time, making individuals more prone to consistently choose eco-friendly products as they become more deeply connected to their surroundings. Hence, longitudinal studies may offer a more enhanced investigation of the transformational effects of awe and provide insights into the lasting impact of awe on sustainable choices. This approach would offer a more holistic understanding of

awe's potential as a tool for promoting positive environmental choices and could shed light on the sustainability of its effects in the long run.

Ultimately, integrating physiological measures with self-report data could offer a more comprehensive understanding of the effects of awe-inducing stimuli on sustainable consumption behaviours. Self-reports provide insights into participants' feelings, but physiological measures like heart rate variability, breath frequency, and appearance of goosetingles can objectively validate these experiences and provide a deeper understanding of the underlying physiological responses related to awe. This holistic approach would enhance our grasp of how awe influences sustainable choices.

6. Conclusion

This study unveils the transformative potential of awe-inducing experiences, particularly when combining moral inspiration with the wonders of nature. These experiences can significantly impact how individuals connect with their environment, perceive themselves, view online shopping environments, and their sustainable consumption behaviour. This study adds valuable insight into the evolving understanding of consumer decision-making in the context of sustainable consumption and online retail, as well as opens doors to designing more effective interventions and strategies for promoting sustainable consumer behaviour in today's world.

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Appendix

Appendix A: Pre-test 1 results

Product Sustainability Perception (0 = , 5 =)					
	M	SD		M	SD
	3.4	1.18		4	1.25
	0.8	0.68		3.5	1.13
	1.2	0.68		2.93	1.03
	1.67	0.9		4.07	0.9
	1.8	1.37		3.47	1
	1.8	1.26		3.6	1.51

	4	0.93		4.13	0.74
	1.33	1.11		1.67	0.98
	2.6	1.45		1.2	0.94
	2.4	1.45		3.4	1.3
	3.13	1.51		3.33	1.11
	1.6	0.99		2.07	1.71
	1.27	0.88		1.33	1.11

	1.33	0.9		3.67	1.05
	2.53	1.81		3.47	1.46
	3.6	1.12		2.01	1.16
	3.53	0.99		2.6	1.3
	1.6	1.06		1.07	0.8
	3.87	0.1		1.67	1.35
	1.87	1.41		1.53	1.30

	2.07	1.49		1.47	1
	3.47	1.06		2.13	1.19
	2.2	1.207		3.87	1.13
	1.8	0.86		3.67	1.29
	2.6	1.18		3	1.2
	3.13	1.41		0.93	0.59

Final Chosen Products

Product Sustainability Perception (1 = not at all eco-friendly, 5 = very eco-friendly)					
Plant-based Products		Organic Products		Non-organic Products	
M	SD	M	SD	M	SD

	4	1.25					0.8	0.68
				4.07	0.9		1.67	0.9
				4	0.93		1.8	1.26
				4.13	0.74		1.33	1.11
				3.4	1.3		1.2	0.94
				3.33	1.11		1.27	0.88

	3.67	1.05				1.33	0.9
							
	3.6	1.12				1.6	1.06
							
			3.87	0.1		1.07	0.8
							

Appendix B Pre-test B results

Awe intensity (0 = not at all awe-inspiring, 7 = highly awe-inspiring)

Condition	M	SD
	5.6	1.25
	5.67	1.30
	5.80	0.65
	6.07	0.85

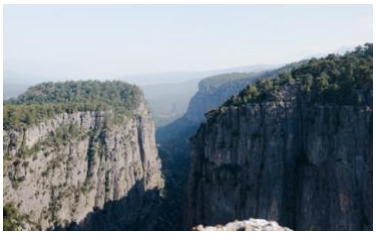
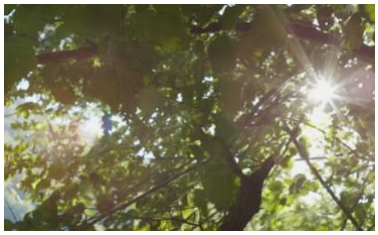
	5.07	1.24
	4.67	1.40
	4.40	1.36
	5.00	1.67
	4.60	1.67
	3.73	1.39
"What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another." – Mahatma Gandhi	5.20	1.33
"The best way to find yourself is to lose yourself in the service of others." – Mahatma Gandhi	4.20	1.87

"It is in your hands, to make a better world for all who live in it." – Nelson Mandela	5.27	1.12
"To forget how to dig the earth and to tend the soil is to forget ourselves." – Mahatma Gandhi	5.00	1.51
"The ultimate test of man's conscience may be his willingness to sacrifice something today for future generations whose words of thanks will not be heard." —Gaylord Nelson	4.67	1.40
"We have forgotten how to be good guests, how to walk lightly on the earth as its other creatures do." —Barbara Ward	5.67	1.45
"The Earth is what we all have in common." – Wendell Berry	4.40	1.82
"*For in the true nature of things, if we rightly consider,*	5.40	1.20

every green tree is far more glorious than if it were made of gold and silver."

Pre-test: Final Awe Manipulations

Awe intensity (0 = not at all awe-inspiring, 7 = highly awe-inspiring)

High Nature Awe Exposure	Low Nature Awe Exposure	High Moral Awe Exposure
		*"We have forgotten how to be good guests, how to walk lightly on the earth as its other creatures do." —Barbara Ward*
Mean= 6.0, **SD**= 0.85	**Mean**= 3.73, **SD**= 1.39	**Mean**= 5.67, **SD**= 1.45

Appendix C Full layout of the websites

Figure 1

Control condition: https://jansens.my.canva.site/four

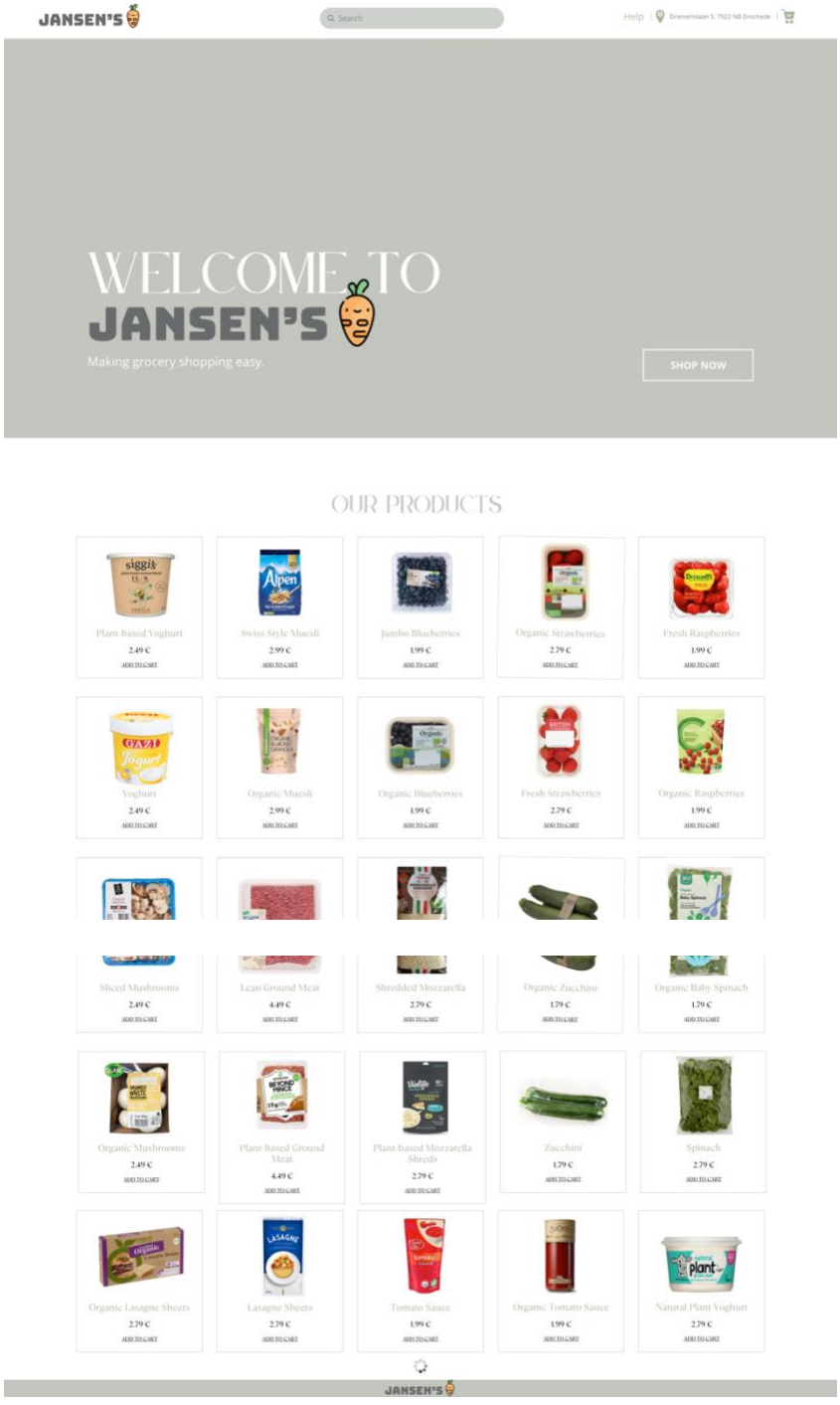


Figure 2

High nature awe condition: https://jansens.my.canva.site/two

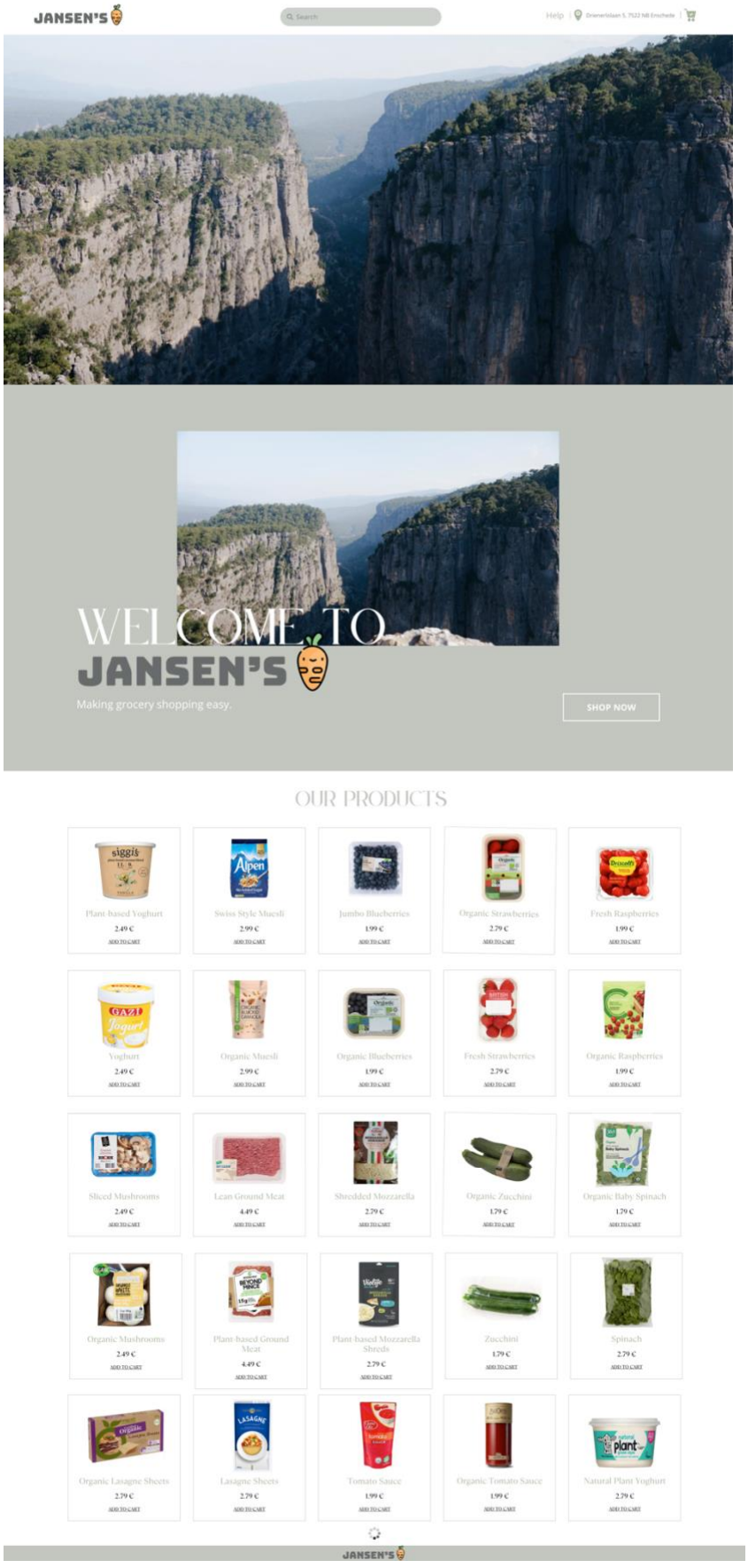


Figure 3

High nature awe and moral awe condition: https://jansens.my.canva.site/five

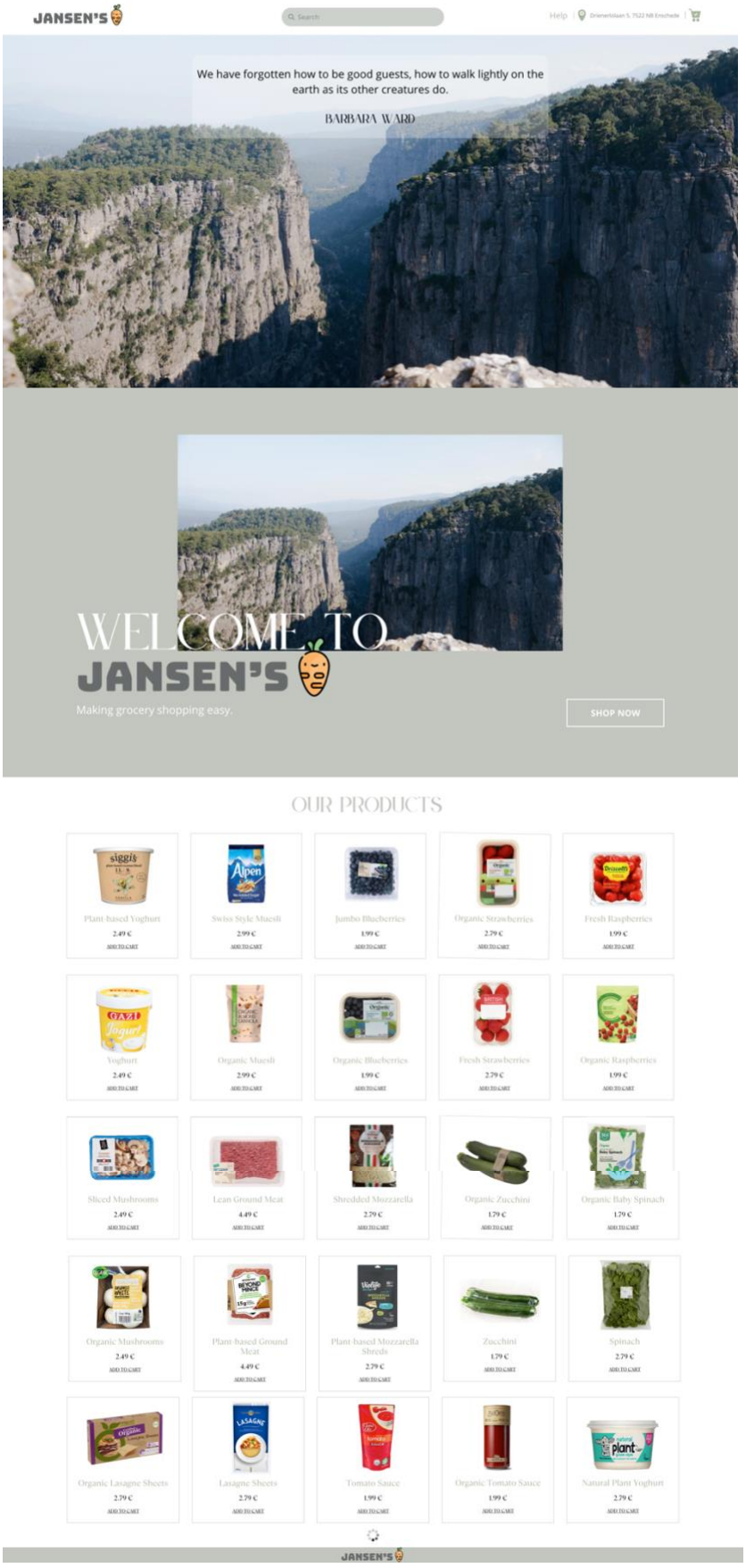


Figure 4

Low nature awe condition: https://jansens.my.canva.site/three

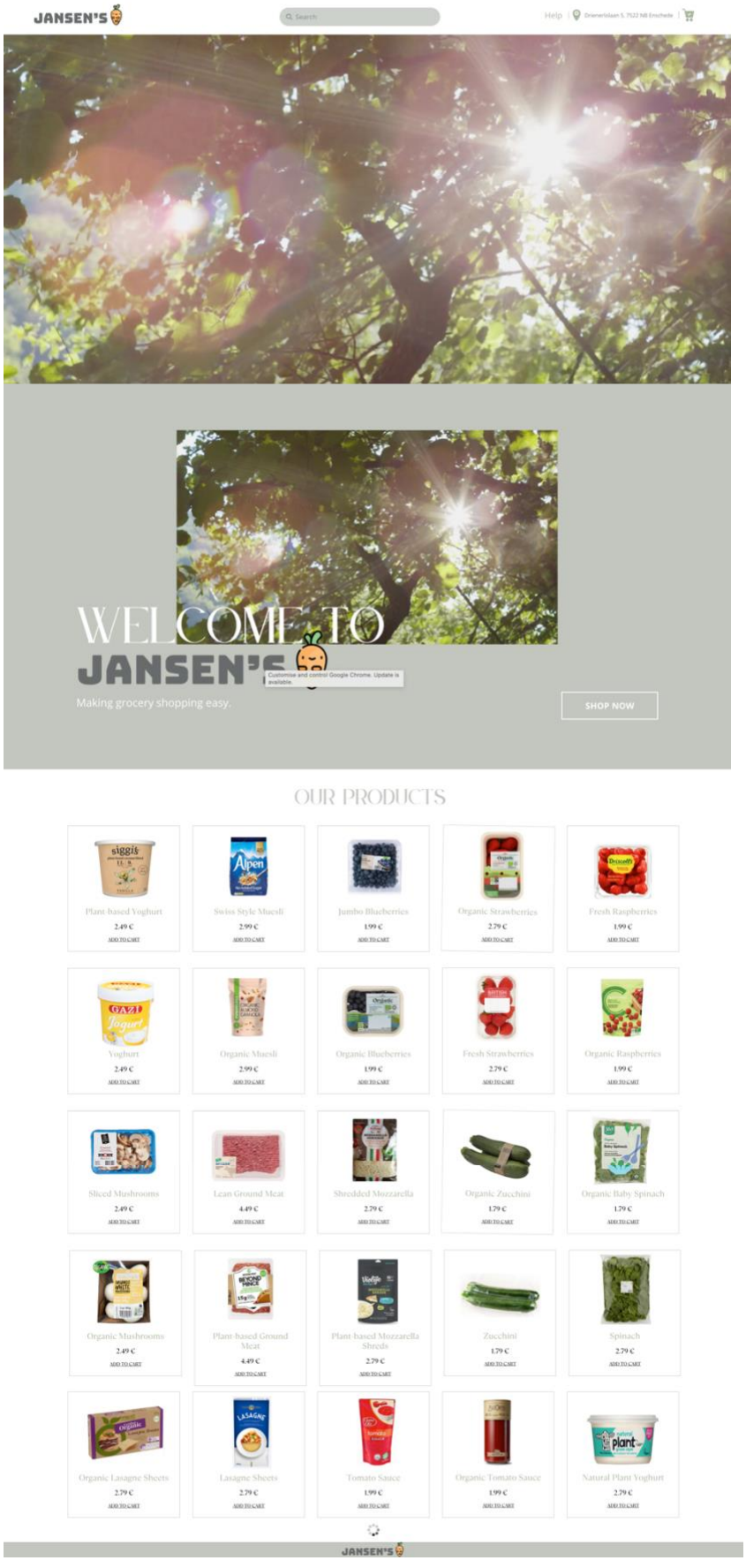


Figure 5

Low nature awe and moral awe condition: https://jansens.my.canva.site/six

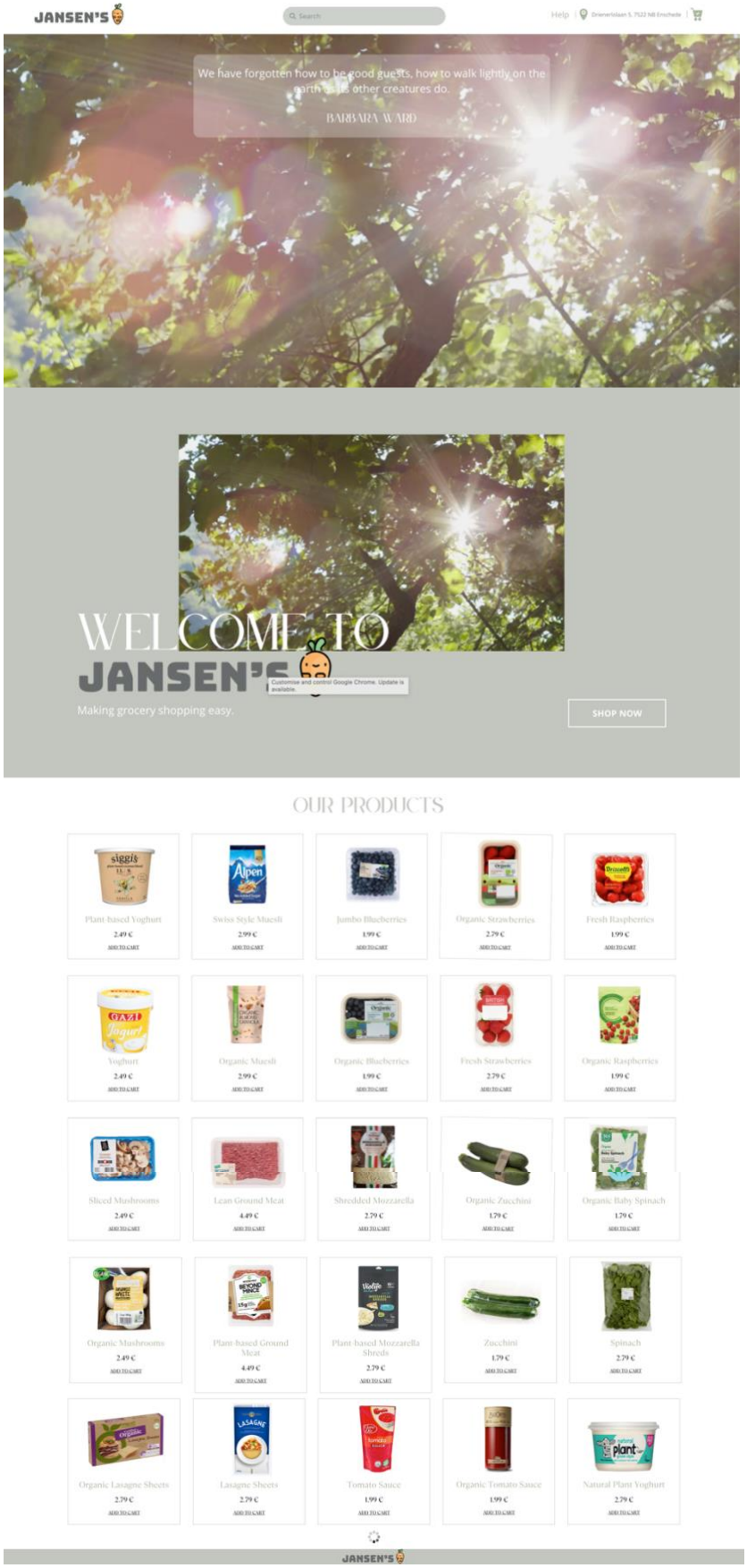
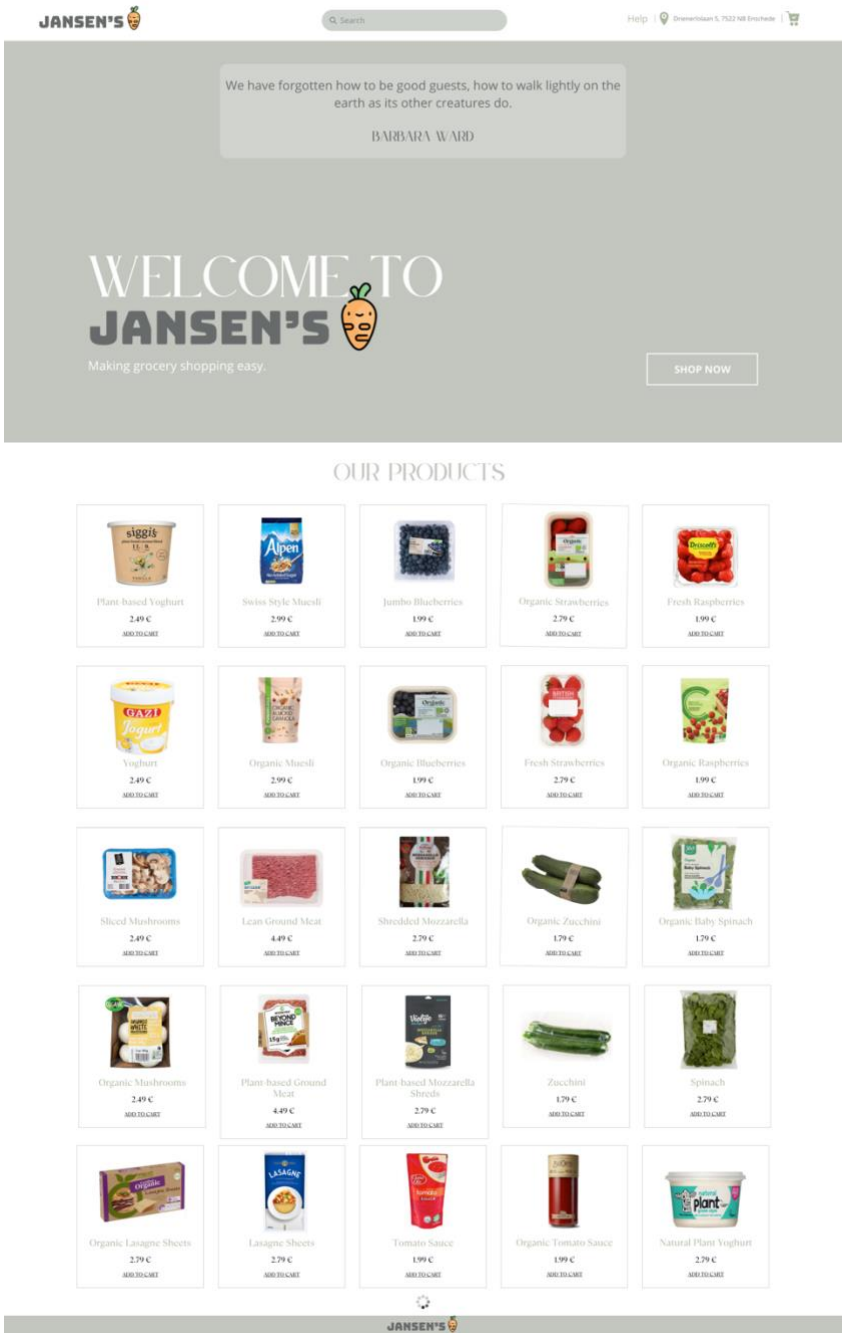


Figure 6

Moral awe condition: https://jansens.my.canva.site/one



Appendix D Experiment task

Appendix E Sustainable consumption behaviour per condition

	Condition						
Sustainable Consumption Behaviour	High-awe scenery	High-awe scenery & moral quote	Low-awe scenery	Low-awe scenery & moral quote	Control	Moral quote	Total
Sustainable Choices	18	23	18	22	17	14	112
Not sustainable choices	12	7	12	8	13	16	68
Total	30	30	30	30	30	30	30