The impact of a comprehensive ecolabel to guide consumers toward more sustainable choices: the effect of the Climate Score and price on consumers' willingness to buy

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Abstract

Behaviour change is needed to combat climate change. A major contribution to this would be to adopt a more sustainable diet. However, limited knowledge on the sustainability of products pose a challenge for consumers. Nutritional labels that are displayed on front of packages, like the Nutri-Score, are promising in promoting healthy food choices. In this online choice experiment, we investigated the effect of a newly designed ecolabel, the climate score, and price, on consumers' willingness to buy coffee and tea products. Environmental self-identity (ESI), the extent to which ones sees oneself as someone who acts environmentally-friendly, was used as a covariate in this study. A 3x4 within-subject analysis revealed that participants were more willing to buy products with higher climate scores compared to products with medium, low or no climate scores. Next to that, it was found that consumers are more willing to buy products with a high price when those products also have a high climate score. Lastly, it was found that ESI predicted the willingness to buy products with a high, medium and low climate score, but not products without a climate score. These findings support the effectiveness of a climate score as a tool to promote sustainable choices, if implemented on all products. The implementation of one overarching ecolabel by the government would enable consumers to make more sustainable choices, thereby fostering a more positive global impact. Further research should focus on creating a real-life design to determine the actual impact of the climate score on consumer purchasing behaviour.

Keywords: ecolabel, willingness to buy, sustainable consumption, environmental self-identity

Introduction

It is well known that global warming is mainly caused by human activities. Our lifestyle choices, transportation methods and dietary habits result in the emission of greenhouse gasses (IPCC, 2022). If this problem is not addressed, it is expected that the earth warms up further with severe consequences, such as food and water shortages, as well as extreme weather conditions that could make certain areas uninhabitable (IPCC, 2022). Therefore, it is crucial that governments take action to guide the behaviour change that individuals need to make in order to combat global warming. In this study, we explore the possibilities to help consumers make more sustainable choices.

To combat climate change as individuals, we need to change our lifestyle, and a major contribution to that would be to transition to a more plant-based diet. It is necessary to adopt a more sustainable diet in order to address climate change (Willett et al., 2019). Many consumers are motivated to behave sustainably, however the translation into actual behaviour is more difficult (Bray et al., 2011). This is described in literature as the attitude-behaviour gap and refers to a phenomenon where individuals hold certain attitudes of beliefs about a particular behaviour, but fail to consistently act in accordance with them. For instance, an individual may acknowledge the importance of sustainability, but still frequently travels by plane. There is evidence that this gap also exists in the field of sustainable consumption (Hassan et al., 2016; Terlau & Hirsch, 2015). Although consumers have environmental concern and a positive attitude towards sustainability, the market share of sustainable products remains relatively low, to just 1-3% of the entire market value (Bray et al. 2011).

When individuals want to behave more pro-environmental, there are multiple barriers which they have to overcome. One of the major barriers is the lack of knowledge on sustainability and on the sustainability of specific products (Bray et al., 2011; Terlau & Hirsch, 2015), which negative negatively affects sustainable purchasing (Joshi & Rahman, 2015). When in fact, knowledge on the sustainability of food products can positively influence the intention and purchase of sustainable products, and can therefore potentially bridge the attitude-behaviour gap (Hidalgo-Baz et al., 2017; Joshi & Rahman, 2015). Thus, consumers need knowledge on sustainability and on the sustainability of food products to be able to make informed and sustainable choices.

Currently, there is no easy way for consumers to differentiate between more or less sustainable products. The Nutri-Score is a Front-of-Package (FOP) nutritional label that is already widely implemented in the Netherlands. It aims to quickly inform consumers of the nutritional value of food products, thereby making it easier for them to distinguish more or

less healthy products. Research suggests that the Nutri-Score helps consumers to assess the healthiness of products, and encourages consumers to purchase healthier options (De Temmerman et al., 2021; Van Den Akker et al., 2022). The Nutri-Score uses a color scale from dark green to red, along with letters from A to E. A green score with the letter A indicates the best nutritional value, while a red score with the letter E represents the worst value. The graphic format of the Nutri-Score reminds consumers of a traffic light and works very well in terms of consumer perception, ease of identification and speed of interpretation (Hercberg et al., 2021). Given the positive impact of FOP nutritional labels on consumers' food choices, it raises the question of whether a similar FOP environmental label could help consumers to make more sustainable choices.

Front-of-package (FOP) environmental labels, better known as 'ecolabels', consist of claims, warnings, or information provided with a product, advising consumers about the quality, features or productions methods that may impact the environment (Thøgersen et al., 2010). There are already lots of different ecolabels on the market. According to the Ecolabel Index, there are at least 456 different ecolabels worldwide (*Ecolabel Index | Who's deciding what's green?*, n.d.). There is a huge variety in the type of information they convey, as well as in how they look. For example, there are ecolabels that provide information on organic origin of a product, on animal welfare and greenhouse gas emissions. In addition, there are lots of ecolabels who specify in certain products, such as in coffee, fish or cotton. Well-known ecolabels are the Fair Trade logo, the Rainforest Alliance logo and the Dutch 'Beter Leven' logo for animal welfare. What currently misses is one overarching ecolabel that looks at the sustainability of the entire life cycle of a product, not just to a specific process or product. The variety of all these ecolabels and the absence of a standardized ecolabel could lead to confusion among consumers rather than providing clarity (Moon et al., 2017). The decisions that we have to make during the day, also when doing groceries, and the wide variety of ecolabels could lead to decision fatigue. Decision fatigue describes the diminished ability to make decisions and to control our behaviour due to repeated decision making (Baumeister et al., 1998; Tierney, 2011). Consumers who experience decision fatigue have an impaired ability to make trade-offs, favor a more passive role in the decision-making process, and often make impulsive or irrational choices (Baumeister et al., 1998; Tierney, 2011). In addition, consumers who experience decision fatigue are more susceptible to use cognitive heuristics and are more sensitive to salient affective product features (Bruyneel et al., 2006a; Pignatiello et al., 2020). The reliability on heuristics challenges consumers' ability to make rational choices, which makes it difficult to behave sustainably (Caruana et al., 2015). That´s why we

believe consumers might benefit from a nudge. Nudging utilizes the fact that we make our choices in a fast and automatic way, by changing the context or environment in which choices are made, to influence consumer behaviour in a positive way (Thaler & Sunstein, 2021). The Nutri-Score and ecolabels could be seen as simple labeling nudges, as they reduce information overload and are easy to interpret (Slapø & Karevold, 2019). Therefore, the current study aims to investigate whether a single, comprehensive ecolabel can encourage consumers to make more sustainable food choices, which we measure based on consumers' willingness to buy.

There has already been extensive research on the effectiveness of ecolabels. A systematic review found that ecolabeling with various messages and formats was associated with the selection and purchase of more sustainable food products (Potter et al., 2021). In an experimental study, they found that it is best to make consumer aware of there being 'better' and 'worse' options when selecting products with ecolabels. This supports the fact that 'traffic light' ecolabels could be effective at steering consumers towards more sustainable choices (Muller et al., 2019; Potter et al., 2022). The 'traffic light' design, which is adopted by the Nutri-Score, works with a color scheme from green to red. Green is the most sustainable option, and red is the least sustainable option, just like green means 'go' and red means 'stop'. Moreover, it was found that specific FOP eco-labelled products, for example products with an ecolabel focused on organic origin, are chosen more often than non-labelled products (Duckworth et al., 2022b). Environmental concern and health motivations of consumers were reliable predictors of choosing labelled products over non-labelled products. Based on these findings, we propose that there will be a main effect of climate score on consumers' willingness to buy.

***Hypothesis 1*: There is a main effect of climate score. More specifically, we expect that consumers are more willing to buy products with a high climate score compared to products with a medium, low or no climate score.**

On the other hand, another study suggested that ecolabels aren't used that much and indicated that use of ecolabels is influenced by consumer motivation and understanding (Grunert et al., 2014). The study found that ecolabels have to compete with other product characteristics like price, taste, brand, and nutritional information. These product characteristics compete with ecolabels for consumer awareness, perceived relevance and impact on decision-making behaviour (Grunert et al., 2014). Given these findings, it would be

interesting to include price in our experiment, to examine the effects on the willingness to buy. We propose that there will be a main effect of price and we expect that consumers will be more willing to buy products when the price is low.

Additionally, it was found that consumers are more willing to pay for sustainable food products (Li & Kallas, 2021a). More specifically, they found that consumers are on average willing to pay almost 30% extra for sustainable products and that gender of the consumer and food categories can influence the willingness to pay. Furthermore, studies have demonstrated that consumers are more willing to pay for products that have ecolabels on them (Bastounis et al., 2021; Duckworth et al., 2022b). Therefore, we propose that there will be an interaction effect of climate score and price, where consumers will be more willing to buy products with a high price, when the climate score is also high. Currently, not much is known yet about the willingness of consumers to pay for products with a low score on sustainability, so we are keeping those options explorative.

***Hypothesis 2*: We expect a climate score x price interaction effect. More specifically, we expect that consumers are more willing to buy products with a high price if they also have a high climate score, compared to products with a medium, low or no climate score. Other possible interaction effects will be explored.**

As mentioned before, use of ecolabels is influenced by consumer motivation and ecolabels have to compete with product characteristics for consumer awareness and impact on decision-making behaviour (Grunert et al., 2014). The motivation of consumers to buy sustainable products of course differs. It might be expected that consumers who have environmental concern, would also act more sustainable and buy more sustainable products. However, because of the attitude-behaviour gap, this is not always the case (Bray et al., 2011; Hassan et al., 2016; Terlau, 2015). Indeed, a study found that the level of ecolabel use does not correspond with the level of environmental concern (Grunert et al., 2014). In this research, consumers had a moderately high level of concern on food production in general terms, but the level of concern diminished on product-related level (Grunert et al., 2014). Other research found that environmental concern might not relate to more ethical consumption, as consumers who had environmental concern did not request information about the sustainability of products if this wasn't given (Ehrich & Irwin, 2005). The researchers argued that this might had to do with blissful ignorance. Blissful ignorance refers to a state of bliss or happiness that arises from being unaware of potentially distressing information. If the people who had

environmental concern were given extra information on the sustainability of the product that they were purchasing, they also have to act in line with that information (Ehrich & Irwin, 2005). Sometimes, it's just easier to not know. In contrast, other research has found that environmental concern did reliably predict the selection of eco-labelled products over non-labelled products (Duckworth et al., 2022b). Moreover, identities have been found as strong predictors of pro-environmental behaviour and explain pro-environmental behaviour better than specific attitudes on sustainability (Gatersleben et al., 2014). Specifically, self-identity has been found to have an essential influence on environmental preferences, intentions and behaviour (Gatersleben et al., 2014). That's why, in this study, we measure environmental self-identity, which is defined as 'the extent to which one sees oneself as a type of person whose actions are environmentally-friendly' (Van der Werff et al., 2014). A strong environmental self-identity increases the likelihood of pro-environmental actions (Van der Werff et al., 2014). Environmental self-identity (ESI) is used as a covariate in this study to examine potential differences in participants' willingness to buy and willingness to pay for products with climate scores. Given the conflicting findings in the literature, we approach the analysis in an exploratory manner.

In summary, individual and governmental action is necessary to guide the transition towards a more sustainable lifestyle. However, the attitude-behaviour gap and barriers such as limited knowledge on products sustainability pose challenges in making sustainable decisions. The effectiveness of Front-of-Package (FOP) nutritional labels, such as the Nutri-Score, indicates the potential effectiveness of FOP environmental labels to support sustainable choices. However, the current large amount of ecolabels and the lack of a standardized one leads to confusion and decision fatigue in consumers, which challenges consumers' ability to make rational choices. This study aims to investigate the impact of a single, comprehensive ecolabel on consumers' willingness to buy sustainable products. Participants will take part in an online choice experiment where they rate their willingness to buy certain coffee and tea products with specific climates scores and prices on them. The findings will shed light on the potential effectiveness of the climate score as a tool to promote sustainable choices. When this approach is effective, the climate score can be implemented by governments to make it easier for consumers to make more sustainable choices. In that way, we can reduce our environmental impact and combat global warming.

Method

Participants

Data collection was done together with a fellow student, to increase the number of participants. A power analysis for a sample size could not be conducted for the chosen design. The fellow student had a required sample size of 270 participants, so this research went along with that sample size.

In total, 436 participants started the survey. Participants without informed consent (N = 6), those who did not complete the experiment (N = 113) and those who failed the attention check with a score below 95 (N = 28) were excluded. Additionally, outliers (N = 5) were removed based on mean completion duration of 40 minutes and 9 seconds. After removing the outliers, the average time for completing the survey was 9 minutes and 55 seconds.

Eventually, 284 participants were included for analysis. Of the included participants, 69.7% were women, 28.9% were men, 1.1% were other and 0.4% preferred not to say. The mean age was 33.74 years (SD = 15.45, range = 18-80). The majority of the participants reported HBO as their highest level of education (32.9%), followed by WO (20.8%) and then a Master's degree (20.5%). The largest part of the participants had net family income of €2,000-€4,000 (23.3%) and €4,000-€6,000 (23.2%), followed by people who preferred not to say (16.0%).

Design

To examine the effects of climate score and price on consumers' willingness to buy, this study used an experimental 4x3 within-subject design. The experiment was created online with Qualtrics. This research was approved by the Ethical Review Board of the Faculty of Social and Behavioural Sciences of Utrecht University, filed under number 23-0306.

Measures

Independent variables

Climate score. This study contained two independent variables, climate score and price. The variable climate score had four conditions: high climate score (A), medium climate score (C), low climate score (E) and no climate score. Ecolabels with a traffic light design were found to be most effective in steering consumers to more sustainable choices (Muller et al., 2019; Potter et al., 2022), therefore we chose a traffic light design with colors and letters for the design of the climate score (see Appendix A). In addition, above the visual it says 'climate score', to make clear that this label shows the environmental impact of the product and not the nutritional value, to prevent confusion. The climate score works in the same way as the Nutri-Score, where a green climate score with the letter A suggests that the product has

the least negative effect on the environment and where a red climate score with the letter E suggests that the product has the most negative effect on the environment. For this experiment, we chose to give the products a fictitious label just to see if consumers would take the label into account when considering if they were willing to buy the product. Each particular type of coffee and tea had its own randomly assigned climate score (see Appendix B).

Price. The second independent variable was price, which had three conditions: low, average and high. The average price of the coffee and tea products were based on average supermarket prices. The low price was 10% below the supermarket average and the high price was 10% above the average. Each product was shown for a low, medium and high price. The reference date for the prices was February 23, 2023. The average price for the coffee products had been estimated at €4,99, which means that the low price was €4,49 and the high price was €5,49. The average price for the tea products had been estimated at €1,65, which means that the low price was €1,49 and the high price was €1,82.

Environmental self-identity. Environmental self-identity was used as a covariate in this study, and was measured at the end of the experiment. The following three items were used to measure environmental self-identity: 'Acting environmentally-friendly is an important part of who I am; I am the type of person who acts environmentally-friendly; I see myself as an environmentally-friendly person'. Participants rated each item on a seven point scale, ranging from *totally disagree* to *totally agree* (Van der Werff et al., 2014).

Dependent variable

Willingness to buy. The dependent variable in this study was the willingness to buy. In the online experiment, different coffee and tea products were shown, with a certain climate score and price on it. For each product, participants were asked to indicate their willingness to buy the product ('How willing are you to buy this product?') on a Visual Analogue Scale (VAS), which ranged from 'not at all willing' (0) to 'very willing' (100) (see Appendix C). It was decided to use the VAS as the research was about the preference of each person and not about the exact score that participants would give.

Procedure

Data was collected between March 9th and April 20th 2023. Participants were recruited through the researchers' personal networks using various social media platforms, such as WhatsApp and LinkedIn. The only inclusion criteria for the experiment was that participants

had to be 18 years or older, as individuals of that age often engage in grocery shopping. The experiment began with an information letter (see Appendix D) explaining the purpose of the study and which required participants to agree with participating through an informed consent. Participants who did not provide consent were directed to the end of the experiment.

The participants who did provide informed consent were directed to the introduction of the experiment, which told the participants the following: 'In a moment you will be shown 24 different coffee and tea products. Imagine the following: you have a party tomorrow for which you still have to buy coffee and tea. For each product you are asked: how willing are you to buy this particular product?' There were four different coffee and four different tea products, and the only thing that differed was the color of the packaging and some symbols for the tea (see Appendix B). The experiment included an attention check halfway through the trials, where participants were instructed to move the slider on the VAS all the way to the right ('yes') ('100').

The trials were randomized within blocks, and there were four blocks with each six products: three coffee products and three tea products. This randomization aimed to prevent the possibility that the same products, with the same climate score or price, would be presented in quick succession. The randomization ensured participants' engagement, minimized automated behaviour and enhanced internal validity.

After completing the 24 trials, participants were asked if they had noticed a label on the products. If participants answered this question with 'yes', they were asked to describe the label. In that way, we could check if participants understood the label and did not confuse it with the Nutri-Score. Next, participants were asked if they used a particular strategy in reviewing the products. Thereby, the researchers hoped to gain a deeper understanding in what the participants took into consideration when reviewing the products.

Lastly, the experiment of the fellow student began with an introduction, whereafter twelve questions were asked. The goal of the experiment was to see if there was a difference in consumers' willingness to buy for meat-sounding or plant based labeled meat alternatives, and if this differed for meat-eaters and vegans. However, this is not relevant for this study.

At the end of the experiment, participants were first asked to answer the three questions on environmental self-identity. Subsequently, demographical questions were asked as control variables, covering age, gender, responsibility for groceries, education, household members, household income, and postal code. In addition, participants were asked if they would consider the climate score if this were to be applied on all products you could buy in the supermarket and why (or why not) they would use it. This allowed the researchers to gain

insight in the behavior of consumers if a climate score were to be introduced. After completing the demographic requirements, participants could read a debriefing where they were thanked for their participation and where the objective of the study was made clear (see Appendix E). The estimated duration of the experiment was approximately 10 minutes.

Analysis

The analysis that was used to answer the hypotheses was a 4x3 within-subject repeated measures ANCOVA. The data retrieved from Qualtrics was analyzed with SPSS 28. The assumptions for analysis were checked in SPSS and were corrected for when violated. The independent variables were climate score and price.

The dependent variable was the willingness to buy. The scores on the VAS were used for analysis, by calculating the mean score of the willingness to buy for each combination of climate score and price (e.g. the VAS score for coffee with climate score A and high price plus the VAS score for tea with climate score A and high price). This provided an indication for the willingness to buy a product with a specific climate score and price combination, per participant. However, it should be noted that a coffee product with climate score E and a high price was missing from the experiment, and that we had a two tea products with climate score C and a high price instead. To address this issue, we calculated the willingness to buy for climate score E and high price using only the single tea product, and for climate score C and a high price, we averaged the willingness to buy across the three products (two tea products and one coffee product).

Furthermore, environmental self-identity served as a covariate in the analysis. The score for environmental self-identity was calculated by taking the mean of the responses on the three questions for each participant.

Results

To examine the effect of climate score and price on consumers' willingness to buy coffee or tea products, we first conducted a repeated measures ANOVA. Initially, the assumptions for ANOVA were checked. The assumption of independence is met, because we used random sampling. However, the assumption of normality was violated, because not all Kurtosis statistics of the difference scores of the outcome variable are below the absolute value of 2.0. Nonetheless, given the large sample ($N = 284$) and the robust nature of ANOVA, this violation is not considered as problematic (Cone & Foster, 2006). The Mauchly's Test of Sphericity had a significant result for climate score, price and the interaction effect ($p < .001$),

indicating a violation of the assumption of sphericity. Therefore, a correction for the degrees of freedom was used. The Greenhouse-Geisser correction was used for climate score and the Huynh-Feldt correction was used for price and the interaction effect, since the Greenhouse-Geisser Epsilon was > .75 for those two variables.

The repeated measures ANOVA revealed a significant effect for climate score $F(1.83, 517.55) = 173.94$, $p < .001$. A post-hoc test with a Bonferroni correction revealed that the climate score conditions (high, medium, low and no climate score) differed significantly from each other ($p < .001$). Furthermore, as you can see in Table 1, the willingness to buy for products with a high climate score was higher compared to products with a medium, low or no climate score, which means that the results are confirming hypothesis 1. In addition to the hypothesis, we found that the willingness to buy for products with no climate score is higher compared to products with a medium or low climate score.

Additionally, we found a significant effect for price $F(1.81, 513.16) = 57.80$, $p < .001$, and post-hoc tests found that all price conditions (high, medium and low) significantly differed from each other ($p < .001$). As you can see in Table 1, we found that the willingness to buy scores are higher for products with a low price, compared to products with an average or high price. Next to the significant effect of both climate score and price, the analysis also revealed a significant interaction effect between climate score and price $F(5.10, 1443.32) = 7.279$, $p < .001$. Figure 1 illustrates the willingness to buy for different climate scores at various price levels. Participants were more willing to buy products with a high price, if they also had a high climate score, compared to a products with a medium, low or no climate score. These findings confirm hypothesis 2. In addition to the hypothesis, we also see that when the price is high, consumers are less willing to buy products with a low climate score, compared to products with a high, medium or no climate score.

Table 1

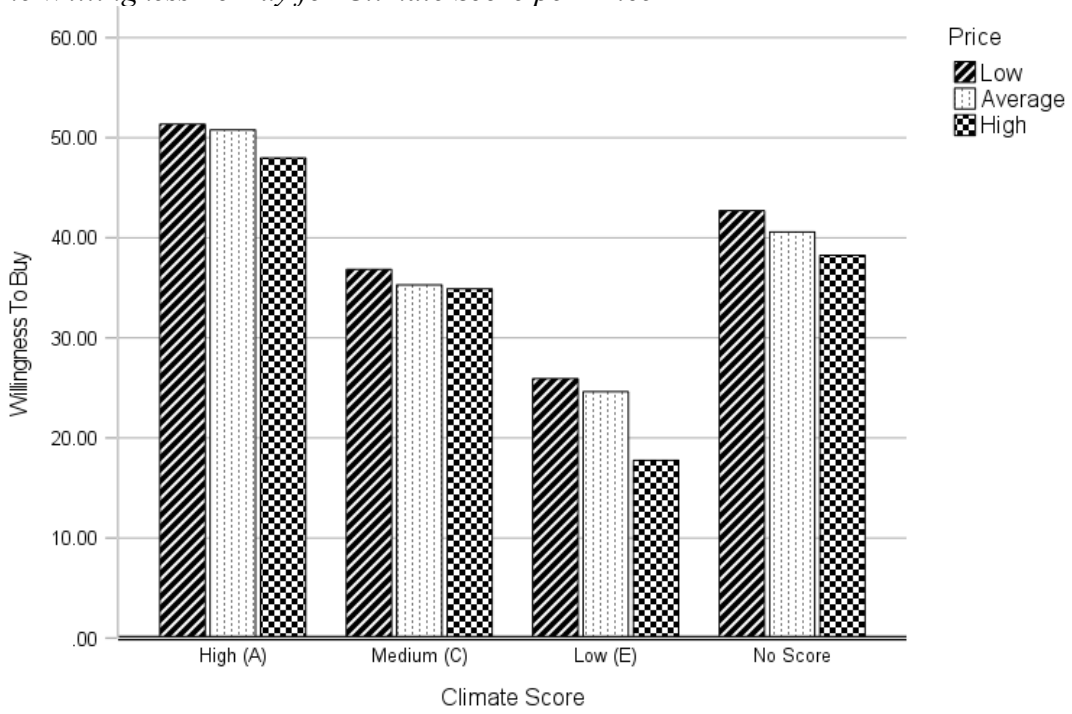
The Mean and Standard Errors for the Willingness To Buy per Climate Score and Price

	Mean	
Variables	Willingness To Buy	*Standard Error*
High Climate Score (A)	50.05***	1.48
Medium Climate Score (C)	35.68***	1.07
Low Climate Score (E)	22.77***	1.12
No Climate Score	40.52***	1.23
Low Price	39.21***	1.04
Average Price	37.83***	1.03
High Price	34.73***	.99

*** All Climate Score and Price conditions differ significantly from another at the .001 level (2-tailed).

Figure 1

The Willingness To Buy for Climate Score per Price



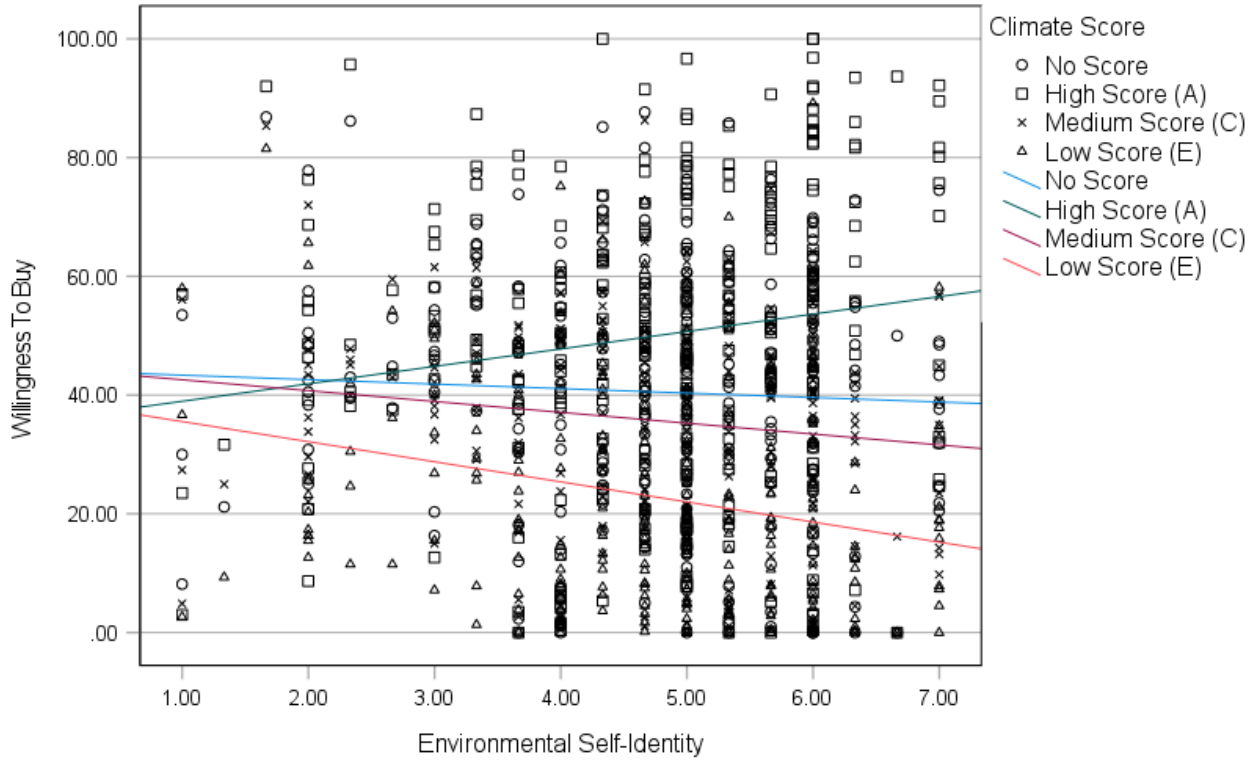
We were also interested in the role of environmental self-identity (ESI). Therefore, we conducted a repeated measures ANCOVA with ESI as a covariate. The assumptions for ANCOVA were checked and met. Interestingly, the main effect of climate score, $F(1.88, 530.30) = 1.52$, $p = .222$, and the interaction effect between climate score and price, $F(5.11, 1442.15) = 1.52$, $p = .180$, were no longer significant. This means that ESI has explained or

accounted for the relationship between these variables and the willingness to buy. However, we did observe a significant interaction effect between climate score and ESI $F(1.88, 530.30) = 15.88$, $p < .001$. Additionally, price remained the only other significant effect $F(1.82, 512.45) = 9.63$, $p < .001$. This means that the effect of price on the willingness to buy is independent of ESI, which is in line with hypothesis 2. Furthermore, ESI on its own did not predict the willingness to buy $F(1, 282) = .91$, $p = .341$.

Given the significance of the interaction effect between climate score and environmental self-identity, we did a follow up regression to explore how ESI predicts consumers' willingness to buy products with different climate scores, regardless of price. We created new variables for willingness to buy per climate score, collapsed across price. We found that ESI predicted the willingness to buy for the high climate score $R^2 = .022$, $F(1, 282) = 6.21$, $p = .013$, as well as for the medium climate score $R^2 = .016$, $F(1, 282) = 4.53$, $p = .034$, and for the low climate score $R^2 = .050$, $F(1, 282) = 14.75$, $p < .001$. However , ESI did not predict the willingness to buy for products without a climate score $R^2 = .002$, $F(1, 282) = .58$, $p = .447$. Figure 2 provides a visualization of the interaction effect between climate score and environmental self-identity.

Figure 2

Interaction effect between Climate Score and ESI



Discussion

This study aimed to investigate whether a single, comprehensive ecolabel could encourage consumers to make more sustainable food choices. An online experiment was conducted, where participants rated their willingness to buy for coffee and tea products with specific climate scores and prices.

First, the analysis revealed that the willingness to buy significantly differs for each climate score condition. It was found that participants were more willing to buy products with a high climate score, compared to products with medium, low, or no climate scores. Therefore, hypothesis 1 is confirmed. These results are in line with literature, as the results support the idea that a traffic light design, where consumers are made aware of better and worse options, is effective in helping consumers to make more sustainable choices (Muller et al., 2019; Potter et al., 2021; Potter et al., 2022). The study of Duckworth et al. (2022b) revealed that products with a specific ecolabel for organic origin were chosen more often than non-labelled products. The current study examined an overarching ecolabel instead of an ecolabel focused on a specific aspect. The results of this study indicate that consumers are more willing to buy products with a high climate score over non-labelled products. These findings are in line with the study of Duckworth et al. (2022b), as the presence of a specific ecolabel on a products means that it is more organic or sustainable than products without the ecolabel, which is the equivalent of having a high climate score on a product. What else is noteworthy is that the willingness to buy products without a climate score is higher compared to products with a medium or low climate score. This phenomenon may be attributed to blissful ignorance. When consumers are not confronted with information on sustainability, they don't have to align their actions with it (Ehrich & Irwin, 2005).

Additionally, the analysis revealed that all price conditions differed significantly from each other. It was found that participants were more willing to buy a product when the price was low, compared to products with an average or high price. These findings are in line with literature, as price continues to play an important role in consumer behaviour, and competes with ecolabels for attention (Grunert et al., 2014). Next to that, we observed a significant interaction effect between climate score and price, which means that the effect of climate score on the willingness to buy is influenced by price, or vice versa. We expected that consumers would be more willing to buy products with a high price, if they also had a high climate score, compared to products with a medium, low or no climate score. Figure 1 makes it evident that when the price is high, participants were more willing to buy products with a high climate score over products with a lower or no climate score, thereby confirming

hypothesis 2. This finding is in line with previous literature, as it was found that consumers are more willing to pay for sustainable food products (Li & Kallas, 2021a) and for products with a specific ecolabel on them (Bastounis et al., 2021; Duckworth et al., 2022b). Next to that, our results reveal that consumers are less willing to buy products with a high price if they have a low climate score, compared to products with a high, medium or no climate score. This means that consumers want to spend less money on products with a low climate score, and thus want to pay less for unsustainable products.

Finally, we conducted a repeated measures ANCOVA to see which effects would remain significant if we controlled for environmental self-identity (ESI), leading to some interesting findings. First, the effect of climate score and the interaction effect between climate score and price were no longer significant. This indicates that, when we control for ESI, there are no longer significant differences in the willingness to buy for different climate scores, and the willingness to buy for climate score does not vary within different levels of price. This also means that ESI has accounted for a part of this relationship. Price did remain significant, which means that the effect of price on the willingness to buy is independent of environmental self-identity.

Additionally, we observed a significant interaction effect between climate score and environmental self-identity, which indicates that the effect of environmental self-identity on the willingness to buy differs for products with different climate scores. More specifically, we found that ESI significantly predicted the willingness to buy for products with a high, medium, and low climate score. Figure 2 illustrates that as ESI increases, the willingness to buy for products with a high climate score also increases. Reversely, when ESI increases, the willingness to buy products with a medium or low climate score decreases. These findings indicate that individuals who view themselves as someone who acts environmentally-friendly, are more willing to buy products with a high climate score, and are less willing to buy products with medium or low climate score. These results are in line with previous studies which have demonstrated that a strong environmental self-identity or environmental concern increases the likelihood of pro-environmental actions (Duckworth et al., 2022b; Van der Werff et al., 2014). However, we also found that ESI does not predict the willingness to buy for products without a climate score. Table 1 shows that the willingness to buy for products without a climate score is relatively high, even higher than for products with a medium or low climate score. Our findings indicate that consumers are willing to buy products without information about their sustainability, even if they consider themselves as someone who acts environmentally-friendly. They don't take the safe approach and therefore risk purchasing a

unsustainable product. The risk that environmentally-friendly consumers take could be attributed to blissful ignorance (Ehrich & Irwin, 2005). Without a climate score, consumers are not confronted with sustainability information and are not compelled to align their actions accordingly. Assessing the sustainability of every product without a climate score would require significant cognitive effort, which would be challenging due to our limited cognitive capacities (Thaler & Sunstein, 2021). Consumers therefore tend to rely on other product characteristics such as price, brand, and visual attractiveness (Grunert et al., 2014) instead of assessing sustainability. The absence of the climate score on products contributes to the lack of knowledge that consumers have on the sustainability of specific products. Therefore, the results of this study are in line with previous literature, indicating that knowledge on product sustainability can influence the intention and purchase of sustainable products (Hidalgo-Baz et al., 2017; Joshi & Rahman, 2015). Based on the results of this study, we can conclude that the climate score, if applied on every product, helps consumers to make more sustainable choices.

Limitations and recommendations

A first limitation of this study is that we only focused of everyday beverage products such as coffee and tea, and not any food products such as vegetables, fruits or bread. Excluding food products from the study may result in an incomplete understanding of the impact of the climate score. Consumers could have other responses to food products, which might differ in perceived importance compared to beverage products. Future research should therefore include food products to explore differences in consumer behaviour. Next to that, despite the intention of the experiment that participants had to buy the products, some participants still based their decisions on personal taste and preferences. After the trials we asked participants if they used a certain strategy when reviewing the products, and some participants answered that it wasn't their preferred brand of coffee and tea, that they did not like the packaging or the kind of coffee and tea, or did not drink coffee or tea. Despite the fact that participants still included their personal preferences and were not willing to buy certain products, we found that the climate score does have a positive effect on the willingness to buy of consumers. For future research, it would be advisable to clarify the introduction text that participants are required to buy the products, perhaps by saying that they are purchasing products for a friend or family member.

Another limitation of this study is that it was a hypothetical and online experiment. For example, participants only had to rate their willingness to buy for products that were chosen for them and they did not have to pay for the products. The behaviour of the

participants could be different in a real supermarket, compared to an online survey (Potter et al., 2022). For future research, it would be good to create a more real life experiment, in a supermarket for example, where participants can choose their own preferred products and actually have to pay for the products that they're buying. Conducting a real-life study in a supermarket, instead of an online hypothetical study, would offer valuable insights into whether consumers would actually buy more sustainable products when the climate score would be provided.

Another recommendation for future research is to take all the five scores of the climate score into consideration. In the present study, we only made use of three scores, high (A), medium (C), and low (E), to see if there were any effects of the newly designed climate score. However, considering only three out of five scores of the climate score could lead to an distorted assessments of the participants, which could influence the results and the validity of this study. In order to get a complete picture of the influence that the climate score could have on consumers' willingness to buy, all scores should be included in future research.

Theoretical and practical implications

This is the first study which used the design and theory behind the Nutri-Score and applied it to design a new ecolabel. In addition, this is also one of the first studies to focus on every day beverage products such as coffee and tea. The results of this study are consistent with, and contribute to, the knowledge of consumers' willingness to buy products with ecolabels and their willingness to pay for products with ecolabels (Bastounis et al., 2021; Duckworth et al., 2022b; Muller et al., 2019; Li & Kallas, 2021a; Potter et al., 2021; Potter et al., 2022). Furthermore, our findings support the role of environmental self-identity in the sustainable purchase behaviour of consumers (Duckworth et al., 2022b; Gatersleben et al., 2014; Van der Werff et al., 2014). Lastly, to our knowledge, we are one of the first studies who found that environmental self-identity does not predict the willingness to buy for products without a climate score.

In practical terms, this study provides evidence for the effectiveness of the climate in helping consumers to differentiate between more or less sustainable products. Consumers are more willing to buy sustainable products and less willing to buy unsustainable products. However, to ensure the effectiveness of the climate score, it should be applied to all products. Currently, there is no easy way for consumers to determine the sustainability of products, but the climate score can serve as a convenient tool to nudge consumers towards more sustainable choices. Although further research is needed, once there is sufficient evidence for the usefulness of the climate score, it can be implemented by governments to reduce the

environmental impact that consumers have through their food choices. The potential usefulness of the climate score is a promising starting point for the dietary changes needed to combat climate change.

Conclusion

In this online experimental study, our aim was to discover the possibilities for helping consumers to make more sustainable choices. Specifically, we investigated the potential effect of a new overarching ecolabel called the climate score on consumers' willingness to buy coffee or tea products, as well as whether there could be an interaction with price. The analysis revealed that the climate score is effective in making it easier for consumers to differentiate between more and less sustainable products, if the climate score would be applied to all products. Consumers, also those who view themselves as someone who acts environmentally friendly, were more willing to buy products without a climate score compared to products with medium or low climate scores. These findings highlights the challenges that consumers face when lacking knowledge on sustainability of products, as it becomes more difficult to make sustainable choices. Consequently, the introduction of a simple labeling nudge, such as the climate score, can help consumers in making sustainable choices. The implementation of one overarching ecolabel by the government would facilitate consumers to make more sustainable choices, ultimately leading to a more positive impact on the world.

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Appendix A

Design of the Climate Score

Appendix B

Products used in the experiment

Appendix C

Example questions of the experiment

€5,49

Hoe bereid ben je om dit product te kopen?

Helemaal niet bereid — Heel erg bereid

€1,82

Hoe bereid ben je om dit product te kopen?

Helemaal niet bereid — Heel erg bereid

Appendix D

Information letter

Beste deelnemer,

Graag willen wij je vragen of je deel zou willen nemen aan ons thesisonderzoek van de Universiteit Utrecht, welke volledig online plaatsvindt. Dit onderzoek is getoetst en goedgekeurd door de Facultaire Ethische Toetsingscommissie (FETC) van de Faculteit Sociale Wetenschappen van de Universiteit Utrecht en voldoet aan de ethische richtlijnen. Dit onderzoek staat onder supervisie van Dr. L. M. J. Swinkels.

Meedoen is vrijwillig en je kunt ten allen tijden stoppen zonder dat je hiervoor een reden hoeft op te geven. Voordat je beslist of je mee wilt doen aan dit onderzoek, willen we je informeren over wat het onderzoek inhoudt en welke vragen je kunt verwachten. Lees deze informatie rustig door. Neem gerust contact op via het e-mailadres onderaan deze pagina als je vragen hebt.

In dit experiment willen wij te weten komen hoe bereid je bent om bepaalde producten te kopen. Er worden verschillende producten getoond en voor elk product word je gevraagd aan te geven in hoeverre je bereid bent het te kopen. Het experiment eindigt met een korte vragenlijst. In totaal zal dit ongeveer 10 minuten duren. Wij willen je vragen dit onderzoek naar waarheid in te vullen, zonder tussendoor een pauze te nemen.

Je zult geen voor- of nadelen ondervinden van deelname aan dit onderzoek, maar je zult bijdragen tot een beter begrip van hoe consumenten productkeuzes maken.

Voor dit onderzoek gebruiken we het softwareprogramma Qualtrics. Dit programma verzamelt gegevens op anonieme wijze en er worden geen IP-adressen verzameld. Verder worden er geen direct identificeerbare gegevens gevraagd. Omdat het onderzoek anoniem wordt uitgevoerd, betekent dit ook dat je je gegevens niet kunt laten verwijderen. Wel kun je ten alle tijden stoppen met je deelname aan dit onderzoek.

De onderzoeksgegevens zullen voor minimaal 10 jaar bewaard worden. Dit is volgens de richtlijnen van de VSNU. Voor informatie over de contactgegevens van de Functionaris Gegevensbescherming kan je terecht op de volgende website: **https://www.uu.nl/organisatie/praktische-zaken/privacy/functionaris-voor-gegevensbescherming** of via het e-mailadres: **privacy@uu.nl**. De enige die toegang hebben tot de data zijn de onderzoekers van huidig onderzoek en de supervisie. Daarnaast kan de geanonimiseerde data van dit onderzoek op termijn opgenomen worden in een open access database. Dit betekent dat ook andere onderzoekers deze data kunnen opvragen voor hun eigen onderzoek.

Deelname aan dit onderzoek is vrijwillig. Je kunt op elk gewenst moment, zonder opgave van reden en zonder voor jou nadelige gevolgen, stoppen met het onderzoek. De tot dan toe verzamelde gegevens worden wel gebruikt voor het onderzoek.

Als je na het lezen van deze informatie besluit om deel te nemen ga je akkoord door middel van het aanvinken van eerste vakje. Daarna word je automatisch naar de online omgeving geleid voor het invullen van het onderzoek.

Bij voorbaat willen wij, Eveliene en Merel, je hartelijk bedanken voor je deelname!

Voor vragen kun je terecht bij: **m.swartjes@students.uu.nl**

Mocht je klachten hebben, dan kun je contact opnemen met de klachtenfunctionaris van de Universiteit Utrecht: **klachtenfunctionaris-fetcsocwet@uu.nl**

Appendix E

Debriefing

Bedankt voor je deelname aan ons onderzoek.

We hebben nuttige informatie verkregen door je bereidheid om bepaalde producten te kopen aan te geven. Het belangrijkste doel van deze studie was om te zien of de klimaatscore, de prijs of de productnaam je koopbereidheid beïnvloeden.

Als je vragen hebt over dit onderzoek, neem dan gerust contact op met Merel via m.swartjes@students.uu.nl.

Bedankt voor je tijd en medewerking!