A Tale of Two Cookies: The Role of Biospheric Values in the Effect of Vegan Labelling

on the Intention to Buy Unexpected-Vegan Food Products

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Abstract

As the demand for vegan products rises, the practice of vegan-labelling is increasingly relevant food producers. To make decisions on vegan labelling, its effect on product perception and consumption behavior needs to be understood. This study explores the effect of vegan labelling of unexpected, randomly vegan products, namely cookies, on buying intention. Previous research found that a vegan label biases consumers' product perceptions (halo-and-horn effect) and they expect the product to be healthier, more environmentally friendly, and less tasty. These perceptions influence intention to buy the product. Additionally, the role of biospheric values, people's concern for the environment, is examined as a moderator. It is expected that 1) intention to buy the product with the vegan label (vs no label) is higher and that 2) intention to buy the labelled product is higher for people scoring high on biospheric values (vs low biospheric values). A 2x2 between subject experiment was conducted on a convenience sample of 219 participants who were presented with different cookie packages. Findings indicate that the labelled products were only perceived as more environmentally friendly but not as less tasty or healthier. Results do not support the hypotheses: intention to buy was not higher for the product with the label and biospheric values were not found to have a moderating effect. This is not congruent with previous research but offers a starting point for ethical, theoretical, and practical implications as well as future research which could include a more realistic setting and different types of food products.

Keywords: vegan label, halo-and-horn effect, biospheric values, unexpected vegan

The Role of Biospheric Values in the Effect of Vegan Labelling on the Intention to Buy

Unexpected-Vegan Food Products

As its consequences are becoming more and more perceptible, the human-induced climate change is no longer a distant future threat but a current crisis. While a lot of public discourse revolves around reducing emissions caused by the transportation and energy sector, not a lot of attention is given to the second-biggest contributor: animal agriculture (IPCC,2018; Global Emissions, 2022). With its impact on air pollution, green-house gas emissions, water shortage and land degradation, livestock plays a key role in climate change mitigation (Steinfeld et al., 2006). Additionally, animal agriculture and thus the production of animal products, is responsible for a great deal of animal suffering, leading to ethical concerns about both environmental factors and animal welfare (Bryant, 2019). Studies looking at the environmental impact of food choices found plant-based diets to be the most environmentally friendly (Rosi et al., 2017). Those high in animal products were found to have the highest impact on greenhouse gas emissions, energy demand and land occupation (Rosi et al., 2017 & Rabès et al., 2020). In response to this, an increasing number of people is changing their dietary habits by either reducing or completely cutting down their intake of animal-products (NSF, 2021). Main drivers for such dietary changes are found to be an increased awareness of animal welfare and of environmental impacts of consumption (Bryant, 2019 & Fiestas Flores & Pyhälä, 2017). Consumers deciding not to reduce their intake of animal products frequently mention concerns about taste and convenience as hindrances (Fiestas Flores & Pyhälä, 2017). However, awareness of the negative impacts and ethical concerns of livestock was found to be generally high across these two groups (Bryant, 2019). Thus, key determinant for dietary changes seems to be the importance of personal benefits and challenges, like taste and convenience, versus a strong ethical concern and values concerning the environment and animals (Bryant, 2019 & Lea et al., 2006).

With a rising number of people consuming vegan products, which is also expected to further increase, and the need to reduce livestock to mitigate global warming; food producers and marketers might be tempted to put a label, indicating that a product is vegan, on their packaging (NSF, 2021). On the one hand, labelling a product as vegan makes it easier for people eating vegan or wanting to reduce their consumption of animal products to detect suitable products, thereby increasing willingness to purchase. On the other hand, some researchers argue that vegan labelling might have a negative effect on willingness to buy the product as it alters consumers' taste expectations and as it could strengthen the perception that non-vegan products are the 'normal' default version (Stremmel et al., 2022). When deciding which product to buy, consumers look at what benefits each product has to offer. Food labels serve as a communication tool giving key information about the product, which was found to influence consumption intention and product perception, including perceived environmental impact (Tobi et al., 2019 & Schifferstein et al., 2021). In a study examining the effect of eco-labels, Mauliawan and Nurcaya (2022) found that as people are increasingly aware of the environmental impact of their consumption choices, (re)purchase intention of products with an eco-label increases (Mauliawan & Nurcaya, 2021). Adding a 'clean-label' to the package design, indicating that the ingredients are only natural, simple, and harmless, was also found to increase perception of healthiness, naturalness, and sustainability (Noguerol et al., 2021). To study the effect of vegan labelling on consumer perception and intention to buy, Stremmel et al. (2022) used randomly vegan products, so those not intentionally made for vegans but products that are coincidentally vegan. While vegan-labelling is a useful tool to facilitate access to information, it can also contribute to the halo-and-horn effect: based on one attribute of the product (vegan), consumers make various assumptions and evaluations of the product (Stremmel et al., 2022). Products with a vegan label were expected to be healthier, more sustainable, and less tasty. Additionally, consumption intention was generally higher for

products with a vegan label compared to products without any label. However, these effects were only found for products that were not expected to be vegan in the first place (Stremmel et al., 2022). Similarly, Kilian and Hamm (2021) investigated how consumers of organic foods perceive vegan products. In a survey, participants were asked about their dietary behaviors and their associations with vegan food. Findings show that vegan products were frequently associated with being free of animal products and animal welfare, while animal welfare was predominately mentioned by people eating vegan or vegetarian. Vegan products were perceived as healthy across all diet groups. However, some participants associated vegan products with malnutrition, being artificial and unhealthy (Kilian & Hamm, 2021). Perceiving vegan products as environmentally friendly was predominantly mentioned by people either reducing or abolishing animal-products from their diet. Furthermore, across all non-vegan groups, vegan products were associated with low taste (Kilian and Hamm, 2021). Based on the halo-and-horn effect and research indicating that vegan products are perceived as healthier, more environmentally friendly, and less tasty than non-vegan products, it seems logical to assume that putting a vegan label on unexpected vegan products, so products that customers do not expect to be vegan in the first place, leads the consumer to expect the above-mentioned product characteristics. Thus, different labels on food packaging and in specific vegan labels, were found to influence product evaluations, perception of consumers and intention to buy the product. Consequently, earlier research suggests that when being opposed to a vegan-labelled product, consumers' reasoning is biased. Instead of further investigating whether the product actually is healthier or more sustainable compared to similar products, they might base their perception and buying intention solely on the label. As there are various factors determining whether a product is sustainable, including packaging and other ingredients like palm oil, it is relevant to study the halo-and-horn bias to examine whether a

vegan label might be misleading for the consumer in terms of environmentally friendly food choices.

To gain a deeper understanding of what influences the effect of vegan-labelling on purchase intention, it is relevant to investigate factors accounting for individual differences in consumption behavior. One important correlation was found to be between individuals' values and consumption behaviors aimed to realize these values (Eibel-Spanyi & Hofmeister-Toth, 2013). Values are defined as abstract, trans situational and stable beliefs and goals that serve as guiding principles for behavior (Schwartz, 1992). A person's values seem to indirectly determine consumption behavior by influencing attitudes which in turn affect behavioral decisions (Rohan, 2000). In studying environmentally friendly behaviors, four distinct value orientations were found to be relevant: biospheric, altruistic, hedonic, and egoistic values. People differ on how important they rate these values which then influences environmental behavior (De Groot & Steg, 2008, Bouman et al., 2021). Those scoring high on egoistic values consider perceived benefits and costs for themselves when it comes to pro-environmental behavior, while high scores on altruistic values imply considering costs and benefits for other people. People having high hedonic values put a lot of importance on pleasure and comfort. Individuals strong on biospheric values consider costs and benefits for the ecosystem itself, without linking these to the welfare of human beings (De Groot & Steg, 2008, Bouman et al., 2021). Scoring high on biospheric values was found to lead to environmentally friendly behavior, as people want to act in line with their values (Wang et al., 2021 & Stern & Dietz, 1994). As acting pro-environmentally often leads to a conflict between individual short-term goals (e.g., convenience and taste) and long-term benefits for the environment and animals (e.g., reduced greenhouse gas emissions), it has been found to most strongly correlate with biospheric values (De Groot & Steg, 2008). Investigating the role of biospheric values in product perception, McGuicken and Palomo-Vélez (2021) looked at the

effect of 'carbon-labels' on product packaging. They found that consumers of products with a carbon-label were perceived more positively, intelligent, prosocial, and trustworthy. This effect was even stronger for people scoring high on biospheric values (McGuicken & Palomo-Vélez, 2021). Thus, findings highlight the role of biospheric values in explaining consumption decisions that are influenced by food-labelling.

To further investigate the usefulness of vegan labelling in promoting environmentally friendly food consumption, the current study looks at the effect of vegan-labelling (DV) on the intention to buy random and unexpected-vegan food products (IV). Additionally, the role of biospheric values as a moderator is investigated (Figure 1). Some prior research has looked at the effect vegan-labelling has on product perception and consumption intention; however, it is relevant to further investigate what factors account for individual differences. A lot of emphasis has been put on the role of values in consumption behaviors and on biospheric values in particular when it comes to pro-environmental behavior. As vegan food consumption is associated with environmental benefits, taking biospheric values into consideration when studying the effects of vegan labelling on intention to buy can shed light on what factors account for individual differences. Since earlier research found vegan-labelling to increase perceived healthiness and sustainability, intention to buy is hypothesized to be higher for unexpected-vegan food products with a vegan label compared to products with no label (H1). Biospheric values are found to positively correlate with environmental concern and sustainable behavior, so intention buy unexpected-vegan products with a vegan label (vs no label) is expected to be higher for people scoring high on biospheric values compared to people scoring low on biospheric values (H2).

Figure 1

Conceptual Model
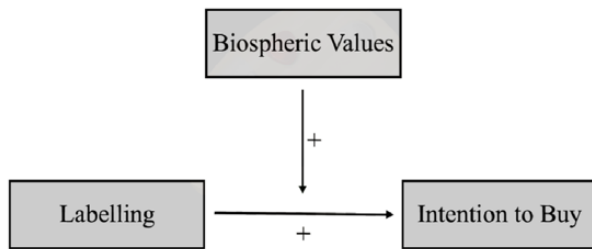
Method

Participants

For this study, a convenience sample was used consisting of respondents that were easy to assess for the researchers, i.e., due to geographical proximity, availability, and willingness to participate. The participants were invited to take part in the study via social media (WhatsApp, Instagram, Facebook). For the analysis, 21 participants were excluded due to failing more than one attention check. This was done to ensure the reliability of the results by removing any participants who may not have been fully engaged in the task. The final sample included in the analysis was therefore comprised of only participants who passed at least two of the three attention checks. This strict criterion was used to ensure the validity and reliability of the results. As a result, 219 participants were used for the data analysis. Of these participants, 145 identified as women, 72 identified as men and 2 did not identify as either. The age of the respondents ranged from 16 to 63, with a mean age of 26.85 and a standard deviation of 10.36. In the sample, 39.7% of the participants indicated The Netherlands as their Nationality (N=87), 49.3% reported Germany (N=108) and 11% reported another country which was later specified (N=24). Moreover, 34.2% of the participants described their type of diet as omnivorous (N=75), 37% as flexitarian (N=81), 19.2% said they were vegetarian (N=42) and 9.6% indicated eating vegan (N=21). Concerning their highest completed

education level, 1.8% reported not having finished high school (N=4), 45.2% of the participants indicated a high school degree (N=99), 37% reported having completed a bachelor's degree (N=81), 14.2% indicated that they completed a master's degree (N=31), and 1.8% reported their highest complete degree to be higher than a master's degree (N=4).

Study Design

An experimental study using a 2 (packaging color: green vs. brown) x 2 (label condition: V-Label vs. no label) between- subjects design was performed. Participants were randomly assigned to one of the four experimental conditions, specifically: a) brown packaging without a vegan label, b) brown packaging with a vegan label, c) green packaging without a vegan label and d) green packaging with a vegan label. As this paper is part of a research project, the extra variable 'package color' was included. However, this variable is not used for this specific study and is therefore disregarded in the analysis. This will be done by only grouping the participants according to the 'No Label vs V-Label' condition. After cleaning up the data set, 118 participants were in the 'V-Label' condition and 101 in the 'No Label' condition.

Procedure

The data was obtained through an online questionnaire which was constructed using Qualtrics. The data collection took place between November 22nd and December 1st, 2022. Taking part in the survey was voluntary and participants received no monetary compensation. Prior to the data collection, the survey was authorized by the Ethics Committee of Psychology of the University of Groningen, who believed it to be appropriate for data collection [PSY-2223-S-0131]. Completing the survey was done in a single session, with an expected time duration between 10 and 15 minutes. The questionnaire began with a section dedicated to informing participants regarding their rights and how the data is handled. Next, the survey required informed consent of the participants. As the study is about cookies, participants were

first asked whether they ever buy cookies to make sure the results are not biased by people simply not liking cookies and therefore having a very low intention to buy them. After presenting the participant with one of the cookie packages, the manipulation check and measurements of the dependent variable and mediator followed. Lastly, participants were asked to answer questions regarding their demographic information including age, gender, nationality, highest completed level of education and dietary identity. Additionally, the study included three attention checks (e.g., 'please choose somewhat agree') and participants were asked whether they responded truthfully.

Materials

Independent variable: Vegan Labelling

For this study, four different cookie packages were designed. These differed in color (brown vs. green) and in labelling (vegan label vs no label) (Appendix A). The vegan label used is the V-Label of the European Vegetarian Union, which is the most used one (Gerke & Janssen, 2017). Every participant was randomly assigned to one of the four experimental conditions and was accordingly presented with one of the four different cookie packages. For this study, the package color is not relevant. Hence, the participants are only grouped according to the labelling, leading to two experimental conditions (V-label vs no label).

Manipulation Checks

To check for the experimental manipulation, namely the effect of different cookie packages, either including no label or a vegan label, four items were included: : "Compared to other chocolate chip cookies, I think the chocolate chip cookies shown are healthier"; "Compared to other chocolate chip cookies, I think the chocolate chip cookies shown taste nicer"; "Compared to other chocolate chip cookies, I think the chocolate chip cookies shown are more environmentally friendly"; "Compared to other chocolate chip cookies, I think the

chocolate chip cookies shown are more sustainable". Participants were asked to rate these statements on a 7-point Likert scale (1= strongly disagree, 7= strongly agree) (Appendix B).

Dependent Variable: Intention to Buy

To assess participants' intention to buy the cookies, a questionnaire based on a study by Stremmel et al. (2022) was used. This scale included three items: "Compared to other chocolate chip cookies, I would rather buy the chocolate chip cookies shown to me"; "Compared to other chocolate chip cookies, I would buy the chocolate chip cookies shown to me in the near future"; "Compared to other chocolate chip cookies, I would buy the chocolate chip cookies shown to me on a regular basis". In this study, the Cronbach's alpha for this scale was found to be 0.775 which can be viewed as valid. Responses were given on a 7-point-Likert scale (1 = not at all, 7 = a lot) (Appendix C).

Moderator: Biospheric Values

To measure biospheric values, the Environmental-SVS scale was used, an adapted version of the Schwartz Value Survey, which was e.g., validated by Bouman et al. (2018). Scores on this scale were found to moderately correlate with environmental self-identity, thus how much someone perceives themselves as a person that acts environmentally friendly (Bouman et al., 2018). The scale consists of four items, which were found to have a Cronbach's alpha of 0.875 (Bouman et al., 2018). Participants were presented with four values including a short description of what they mean: PREVENTING POLLUTION (protecting natural resources), PROTECTING THE ENVIRONMENT (preserving nature), RESPECTING THE EARTH (harmony with other species) and UNITY WITH NATURE (fitting into nature). Using a 7-point-likert scale, respondents were asked to rate how important each value is as a guiding principle in their life (0= the values is not important at all, 7= the values is of supreme importance) (Appendix D). Composite scores are computed by calculating the mean of the four items (Bouman et al., 2018). In this study, a Cronbach's

alpha of 0.913 was found for the scale measuring biospheric values, which can be regarded as a high reliability.

Results

The statistical analysis was conducted using IBM SPSS Statistics Version 27.

Manipulation Checks

To investigate whether the experimental manipulation has worked, an analysis of variance was conducted for each manipulation check, grouping the participants according to their experimental condition (V-Label vs. No Label). For this ANOVA, three assumptions should be met: 1) the sample should be independent and random, 2) the dependent variable needs to be normally distributed for each group, and 3) the standard deviation must be the same for each group. No evidence of violation of any assumption was found in any manipulation check. Results of the ANOVA for perceived healthiness are non-significant $(F (1,217) = 0.336$, p-value $= 0.563)$. Thus, there is no evidence for differences in mean of perceived healthiness between the label group (M=3.46, SD=1.466) and the no label group (M=3.35, SD= 1.352). Similar results were found for the item measuring perceived taste: results of the ANOVA are also non-significant $(F (1,217) =2.432$, p-value $=0.12)$. Thus, there are no statistically significant differences in the group means of perceived taste in the 'V-Label' condition (M=4.42, SD= 1.31) compared to the 'No Label' condition (M=4.68, SD=1.216). For perceived sustainability, results of the ANOVA are statistically significant $(F (1,217) =17.959$, p-value $<0.001)$, suggesting a significant difference in means of perceived sustainability in the two conditions. The product with a V-Label was perceived as more sustainable (M= 4.23, SD= 1.647) than the product without a label (M=3.37, SD= 1.347). Similar results were found for perceived environmental friendliness: results of the ANOVA are statistically significant $(F (1,217) =12.327$, p-value $<0.001)$. Thus, there is a statistically significant difference in the means of perceived environmental friendliness in the two groups,

Table 1

Descriptive Statistics

		Min.	Max.	M	SD
All	ITB	1	7	4,0441	1,23307
	BV	1	8	5,7842	1,39645
V-Label	ITB	1	7	4.088	1.254
	BV	2	8	5.771	1.372
No Label	ITB	1	6.67	3.993	1.212
	BV	1	8	5.799	1.431

Note. ITB= Intention to Buy, BV= Biospheric Values

with a higher mean in the V-Label condition (M=4.23, SD=1.63) compared to the No Label condition (M=3.48, SD=1.527). Thus, as expected, products with a label were perceived as more sustainable and as more environmentally friendly. However, contrary to expectations, the labelled cookies were not perceived differently in terms of taste and healthiness.

Descriptive and Correlations

Descriptive statistics of the dependent variable 'Intention to Buy' and the moderator biospheric values can be found in Table 1. There was no statistically significant correlation between biospheric values and intention buy when the whole data set was analyzed (r=0.13, p-value=0.055). When splitting the data accordingly to the two experimental conditions, there was a statistically significant correlation between intention to buy and biospheric values in the 'V-Label' condition (r=0.217, p-value<0.05) but not in the 'No Label' condition (r=0.03, p-value=0.766).

Hypothesis Testing

Firstly, a univariate analysis of variance (ANOVA) was conducted to analyze whether there is a statistically significant difference between the means of the 'V-Label' and the 'No Label' group in intention to buy (H1). There was no evidence for violations of any of the assumptions. Results of the ANOVA are not statistically significant (F (1, 217) =0.316, p-value >0.05). Thus, there is no evidence for a difference between group means. This result does not support the first hypothesis: intention to buy was not found to be significantly higher

for the product with the vegan label compared to the product without a label. To further investigate the effect of vegan labeling on intention to buy and the role of biospheric values as a moderator, a multiple linear regression was conducted. For this analyses, the independent variable 'labelling' was coded using dummy coding with the 'No Label' condition being used as a reference group (Vegan Label=1, No Label = 0). Furthermore, the moderator biospheric values was standardized. First, it was checked for the four assumptions of linear regression: 1) residuals of the dependent variable should be normally distributed, 2) homoscedasticity, 3) linear relationship between the independent and dependent variable and 4) no or little multicollinearity. No evidence was found for violation of any assumption. Results of the multiple regression analysis show a non-significant coefficient for the labelling (beta=0.039 p=0.559). For the moderator biospheric values, the coefficient is also non-significant (beta=0.13, p=0.055). Thus, there is no evidence that the labelling or the biospheric values significantly predict intention to buy. The adjusted R squared of the model, which indicates the percentage of variance explained in intention to buy by the labelling and biospheric values is 0.009 (F (2,216) =2.027, p-value=0.134), which is very low. Next, the interaction term (biospheric values*labeling) was added to the model to test whether the effect of labelling on intention to buy is moderated by the biospheric values. When adding this, the adjusted R squared increased to 0.014, which is however also not statistically significant and very low (F (3,215) =2.066, p-value=0.106). The interaction effect was not found to significantly add to the prediction of the outcome variable (beta= 0.141, p-value =0.147). Thus, while the interaction effect adds to the total explained variance in intention to buy, it does not seem to be statistically significant. Hence, the significant correlation between biospheric values and intention to buy in the V-Label condition does not seem to be relevant. Additionally, an analysis of covariance (ANCOVA) was executed, including biospheric values as a covariate. All assumptions were checked (normality, linearity, homogeneity of regression slopes &

homogeneity of variance) and no evidence for violation was found. Results of the ANCOVA also show a non-significant interaction effect between biospheric values and the labelling ($F_{(2, 216)}$ =2.121, p-value =0.147). Additionally, both main effects of the labelling ($F_{(1, 217)}$ =1.634, p-value= 0.203) and the biospheric values ($F_{(1,217)}$ =3.548, -value= 0.061) were non-significant. The partial eta squared, so the variance explained by biospheric values, suggests a small effect size (η^2 =0.016). Again, these results do not support the hypothesis that biospheric values influence the effect of vegan labelling on intention to buy.

Discussion

In this study, an experiment was conducted investigating the effect of vegan labelling of unexpected-vegan food products, namely cookies, on intention to buy. It was hypothesized that intention to buy the cookies is higher for the product with a vegan label compared to the product without a label (H1). This was expected as prior research has found products with a vegan label to be perceived as healthier, more environmentally friendly, and more sustainable (Stremmel et al., 2022). Furthermore, the role of biospheric values as a moderator was examined. As scoring high on biospheric values was found to be a good predictor for environmentally friendly behavior and products with a vegan label were found to be perceived as more sustainable, it was expected that people scoring high on biospheric values have a higher intention to buy the vegan labelled product compared to people scoring low on biospheric values (H2) (e.g., Stremmel et al., 2022). The first hypothesis was not supported by the results: there was no statistically significant difference in the intention to buy the product with the vegan label compared to the product without a label. This finding is not in line with prior research, which has found that putting a (vegan) label on a product alters product perceptions and in turn influences intention to buy (e.g., Stremmel et al., 2022). Based on one characteristic of the product, which is indicated by the vegan label, people make assumptions about the product (halo-and-horn effect). Previous research has found that

products with a vegan label are perceived as healthier, more environmentally friendly, and less tasty which influences intention to buy (e.g., Stremmel et al., Tobi et al., 2019 & Schifferstein et al., 2021). Analysis of the manipulation checks however indicate that the product with the V-Label was not, contrary to the expectations, perceived as healthier or less tasty but only as more environmentally friendly and sustainable. Hence, the halo-and-horn effect described in earlier research has only been partly supported by the results. These findings can serve as a starting point to explain the non-significant difference in intention to buy the labeled versus the unlabeled product. Results for the second hypothesis are similar: there was no statistically significant effect of biospheric values, and the interaction effect was also not statistically significant. Interestingly, analysis of the manipulation checks shows that products with a vegan label were indeed perceived as being more environmentally friendly and sustainable. Despite this perception however, intention to buy was not higher for the environmentally friendly product.

Contrary to what was expected, intention to buy was not higher for the product with the vegan label. One possible explanation for this might be that different to what other researchers found, vegan labelling might not have a relevant influence on consumer intentions to buy unexpected, randomly vegan cookies. When buying (food) products, many factors are considered, and it might be that a vegan label is only one of those factors that does not play an especially crucial role (Nillson et al., 2007). This could also explain why the second hypothesis was not supported: people who care about the environment and want their consumption choices to be more sustainable might look at several factors, like plastic packaging or other ingredients, and thus the effect of a vegan label is not as a relevant as expected. Another factor that should be considered is that in this study a hedonic food product, namely cookies, was used. Hedonic food products mainly refer to unhealthy products that are bought and consumed to fulfill short-term, egoistic goals like pleasure, taste, and

immediate gratification (Antonides & Cramer, 2013). When deciding to buy hedonic products, other types of values like egoistic and hedonic values, namely those who are concerned with fulfilling individual needs and goals like pleasure and enjoyment, might be more relevant for the consumer then biospheric values. Moreover, Steg et al. (2014) suggest that in researching pro-environmental behavior, hedonic values should be considered. Especially in the scenario of buying products that are connected to hedonic goals, like taste and pleasure, hedonic values might play an important role and might interact with biospheric values. This could be another interesting direction for future research: It might be useful to look at more than one set of values and to investigate how these interact in influencing intention to buy. As stated above, four kinds of values are relevant for environmentally friendly behavior: biospheric, altruistic, egoistic, and hedonic values (de Groot & Steg, 2008, Bouman et al., 2021). Investigating more than one of these would have exceeded the scope of this study, however it would be valuable to further research all of them in the context of intention to buy vegan labelled products. Moreover, future research could make biospheric values salient before measuring intention to buy, e.g., by presenting participants with more information about the environmental impact of the product and about their environmental responsibility as a consumer. Like this, biospheric values might have a stronger effect on intention to buy.

Furthermore, recent research has found that people tend to underestimate their individual impact on climate change when it comes to changing their diets (Wynes et al., 2019). Hence, while people who care about the environment and thus have high biospheric values perceive the vegan-labelled product to be more environmentally friendly, they might underestimate the positive impact single individual food choices have on the environment (Wynes et al., 2019). Again, future research could include more information on the environmental impact of changing to a (more) plant-based diet at the beginning of the study to

increase awareness. By doing this, it could be studied whether non-significant results of this study might be due to an underestimation of the environmental impact of individual food choices.

Another possible explanation and a key limitation of this study concerns its lack of ecological validity – how generalizable the research findings are to the real world (APA). Asking participants about their intention to buy a product in an online survey might be unrealistic and not generalizable to a real-life situation. When usually making buying decisions about food, people are in a supermarket where they are presented with a variety of different cookies from which they can choose. In those situations, when people must compare products to choose from them, a label might be crucial for decision-making as it gives key information and allows for better consideration (Tobi et al., 2019 & Schifferstein et al., 2021). In this study, participants were only presented with one product and did not have the opportunity to compare and choose between different cookies. These differences might be relevant for the intention to buy. Future research could take a different approach to decrease this limitation. This could e.g., be done by conducting a lab-experiment in which participants are presented with different cookies in a more realistic setting and then intention to buy and product perceptions can be assessed. Alternatively, a field study could be conducted in which actual sales numbers are investigated or in which people in supermarkets are interviewed and observed. By doing so, the topic would be examined from a different perspective which would enrichen the knowledge about the effect of vegan labelling.

Another limitation of this study concerns the sample: it was a convenience sample consisting of WEIRD participants (drawn from populations that are white, educated, industrialized, rich and democratic), with most participants being either Dutch or German. As these countries are both WEIRD and share similar values, the results might be biased. Furthermore, the age distribution of the sample is quite homogenous, with the majority of

participants being younger than 30. As the study consisted of an online survey and required the participants to understand English, some groups were excluded and there might be a big number of participants living in a rather international environment. As a consequence of this homogenous sample, the finding might be biased, and the results might not be representative for a bigger population. Further research could use a more diverse sample with extended age groups and participants from different (non-western) countries.

While there was no significant effect of vegan labelling on intention to buy, the labelled product was perceived as more environmentally friendly and sustainable. However, there are various factors determining how sustainable a food product is, one of them being other ingredients like palm oil, whose production is a great contributor to deforestation and biodiversity loss (Sundaraja et al., 2021). Despite palm oil being on the ingredient list in the study, people perceived the product as more environmentally friendly compared to other cookies. This highlights the importance of examining vegan labelling from an ethical perspective: while vegan diets were overall found to be more environmentally friendly, not all vegan products are per se good for the environment, as this can be influenced by other factors like production, packaging, and ingredients (e.g., Guillard et al., 2018 & Sundaraja et al., 2021). Due to the halo-and-horn effect however, people perceive vegan-labelled products as better for the environment which biases consumers' reasoning. For some products, this perception might however misleading, which can be problematic: consumers might falsely assume they are making a sustainable food choice by buying vegan-labelled cookies without further investigating the product. This could even be compared to greenwashing; a common issue in which consumers are misled by companies in terms of how environmentally friendly a product is (Vieria de Freitas Netto et al., 2020). Thus, when deciding whether to put a vegan label on a product, it should be considered whether this might be misleading for consumers in terms of how sustainable the product is. Additionally, consumers should be educated on

taking a closer look on (food) products to minimize the effect of biases like the halo-and-horn effect.

Despite some limitations, this study contributes to the body of knowledge in the field of environmental food choices. Results show that consumer intentions are complex and cannot be explained by one factor like vegan labelling. Putting a vegan label on a product might not have that big of an influence on consumers' buying attention. Nevertheless, vegan labelling was found to partly influence products perceptions in terms of its environmental impact. Findings have several implications for producers of unexpected, randomly vegan, and hedonic food products: Adding a vegan label does not seem to have a (negative) impact on consumers' intention to buy the product and it brings benefits like increased transparency and easy recognition of vegan products. However, if we want to promote vegan products that are more sustainable to increase environmentally friendly food choices, vegan labelling might not be enough. To achieve this, the target audience need to be considered and future research can look at additional factors like packaging and awareness of the environmental impact of individuals' food choices. When doing so, it should be considered whether the product actually is more environmentally friendly than similar products or whether a vegan label might be misleading. If the product really is more sustainable, additional labels like carbon-emission labels, indicating the carbon dioxide emissions created by the product, can be added to give customers more information (Taufique et al., 2022). Investigating the effect of other labels, like the carbon-emission label, on consumer behavior and product perception could also be target of future research. Additionally, findings emphasize the importance of educating people on consumption behavior and its impact, so biases like the halo-and-horn effect can be minimized.

Moreover, this study highlights the complexity of the influence values have on behavioral intentions. Investigating one set of values might not be enough to explain

consumer decisions. All in all, this study offers some valuable insights for policy makers who want to promote more sustainable diets, for marketers who are interested in the effect of labelling their products and it serves as a starting point for future research in the domain of vegan labelling and pro-environmental consumer behaviors.

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Appendix A

Cookie Packages Used in The Experiment

Figure A.1

Green packaging with and without V-Label and green backside

Figure A.2

Brown Packaging with and without V-Label and brown backside

Appendix B

Items Manipulation Check

Product Perceptions were measured using the following items. Answers were given on a 7-

point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

"Please rate the following statements.

Compared to other chocolate chip cookies...

- I think the chocolate chip cookies that were shown to me are healthier.

- I think the chocolate chip cookies that were shown to me are tastier.

- I think the chocolate chip cookies that were shown to me are environmentally friendly.

- I think the chocolate chip cookies that were shown to me are sustainable."

Appendix C

Items Intention to Buy

The dependent variable 'intention to buy' was measured using the following items. Answers were given on a 7-point Likert scale ranging from 1 (not at all) to 7 (a lot).

"Imagine that the chocolate chip cookies that were shown to you are available in stores. Then, rate the following statements.

Compared to other chocolate chip cookies...

- I would rather buy the chocolate chip cookies that were shown to me.

- I would buy the chocolate chip cookies that were shown to me in the near future.

- I plan to buy the chocolate chip cookies that were shown to me on a regular basis."

Appendix D

Items Biospheric Values

Biospheric Values were measured using the following scale. Participant were asked to rate each value on a 7-point Likert scale ranging from 0 (the value is not important at all) to 7 (the value is of supreme importance).

"Below you will be presented with four values including a short description of its meaning. Please rate how important each value is as a guiding principle in your life.

- PREVENTING POLLUTION (protecting natural resources)

- PROTECTING THE ENVIRONMENT (preserving nature)

- RESPECTING THE EARTH (harmony with other species)

- UNITY WITH NATURE (fitting into nature)"