

**Sustainable by default: how horizontal versus
vertical default product options nudge sustainable
product choices**

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Abstract

This research examines the effect of horizontal versus vertical display of products differing in terms of sustainability, as well as which visual display will result in a preference of the sustainable product. The results show that displaying a sustainable product on the left-hand side (versus right) of an unsustainable product, will nudge consumers into making a sustainable product choice. Furthermore, displaying a sustainable product at the top (versus down) of an unsustainable product will result in a sustainable product choice. This current research failed to find evidence for the relationship between processing fluency and sustainable product choices. Due to the growing interest in sustainability and the pressure from society and government to make sustainable choices, it is relevant to investigate how we can put together choice architectures that nudge sustainable choices to influence consumers in making a sustainable product choice. It can be concluded that horizontal and vertical display techniques, like default product settings differing in sustainable and unsustainable options, can be used as nudges to encourage a sustainable choice among consumers.

Preface

This research examined the effects of positioning a sustainable product on the left-hand side (versus right) or above (versus down) of an unsustainable product by the use of product default options and whether this would result in the preference of the sustainable product. This research is conducted for my master's thesis which makes it possible for me to graduate with a master's degree in Business Administration at the Radboud University Nijmegen in 2019.

I went through my thesis process with great pleasure and I am proud of my final result. During this project I have received support from different people whom I would like to thank in this preface. To start with, I would like to thank my supervisors Nina Belei and Vera Blazevic for their involvement and insightful comments. I also want to thank all of the participants who conducted my pretests and experiment. Without your cooperation I would have not been able to find results and conduct the analysis. Finally, I would like to thank my family and friends for their interest, support and trust, which kept me motivated through the process.

I hope you find my thesis of interest.

Astrid Hendrikx

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Table of Contents

1. Problem Formulation	6
1.1 Nudging for desirable choices	6
1.2 Horizontal and vertical displays	8
1.3 Scientific and societal relevance.....	9
2. Theoretical Background.....	11
2.1 Display & Processing Fluency.....	11
2.2. Horizontal Directionality	12
2.3 Vertical Directionality	13
2.3 Horizontal display stronger.....	15
3. Methods.....	17
3.1 Research method.....	17
3.2 Pretests	18
3.2.1 Pretest processing fluency	18
3.2. 2 Pre-test perceived sustainability	19
3.3 Respondents	21
3.4 Procedure	22
3.5 Stimulus material	23
3.6 Measurement instruments	25
3. 6. 1 Independent variable.....	25
3.6.2 Mediator.....	25
3. 6. 3 Dependent variables.....	25
3. 6. 4 Control variables.....	26
3.7 Factor Analyses.....	27
3.8 Plan of analysis	29
3.9 Research integrity	31

4. Results	32
4.1 Assumptions.....	32
4.2 First hypothesis horizontal display	33
4.2. Second hypothesis vertical display	37
4.3 Third hypothesis horizontal display stronger.....	40
5. Conclusion and Discussion	40
5.1 Conclusion	40
5.2 Discussion.....	41
5.2.1. Theoretical Implications	44
5.2.2 Practical implications.....	45
5.3 Limitations and future research	46
6. References	49
Appendix A: Products displayed during experiment.....	52
Appendix B:	
Pretest Processing Fluency	54
Pre-test sustainable or unsustainable product	59
Appendix C: Questionnaires used for the experiment	68
Appendix D: Output Assumptions.....	128

1. Problem Formulation

Rankabrand.nl brought out the results of a national Dutch survey held in 2012 about the use of sustainable products among adolescents between 18 and 25 years old. Of those surveyed, the majority agreed that as society we need to consume more sustainable products and improve the environment for future generations. In recent years there has been a growing public interest and consciousness about the environment. Government is demanding citizens and organizations to become more responsible and encourages society to put their money into sustainable product choices. For instance, solar panels, recycled products, fair trade and green energy. According to Mittelstaedt, Shultz, Kilbourne and Peterson (2014) there is a mega trend regarding sustainability, which is built on the foundation that we need to protect our planet and resources. It has become a global commitment that we need to protect the environment while providing a future for many generations to come. Many companies are starting to put together sustainability policies, showing they are making sustainability a core mission within their organization. Also, government is starting to implement policy moves to encourage society to make sustainable choices. However, even when society and government are encouraging to be green and sustainable, it is still a matter of choice for consumers.

A matter that consumers as decision-makers can also choose not to do. In accordance, the survey of Rankabrand.nl discovered that less than 22% of the respondents actually buy products that are green and sustainable. It is rarely seen that an environmental and socially responsible product outsells its less sustainable alternatives (Bemporad, Coulter & Lee, 2012). So, it is clear that there is a significant gap between consumers' intentions and behaviors. This is where this present research comes in and provides fundamental building blocks to navigate consumers in the preference of a sustainable product choice. It provides guidelines in how to influence consumers in the choices they make.

1.1 Nudging for desirable choices

Behavioral research has shown that consumers can be influenced in the choices they make. This influence of choice can be affected by how choice is presented (Johnson et al., 2012). This can be referred to as choice architecture and is associated with the context in which we choose and make decisions. Whenever institutions, private or public, form sets of options where people can choose from, they turn into 'choice architects' (Johnson et al., 2012). A nudge is a facet of these 'choice architectures' that steers people's behavior in a favorable way, without blocking out any options or altering their economic incentives (opposed to some other interventions)

(Johnson et al., 2012). According to Johnson et al. (2012) people can be ‘nudged’ into making certain desirable choices. Nudges derive their subtle power through the fact that they have structural elements embedded into those choice architectures. They are always switched on and once put in place they exert influence on behavior without depending on continued human operation (Quigley, 2013). Nudging techniques come in many forms. For instance, the design of toolkits for customization (also called configurators) can also be seen as choice architectures and can contain nudges that will help consumers make certain desirable choices. The way design configurators are put together can play an important role in determining the final choice of the consumer. (Chae & Hoegg, 2013). According to Johnson et al. (2012) one of the most popular design configurators used within choice architecture is the use of default settings. Defaults are settings of choices that apply to individuals who do not take active steps to change them. Defaults have been shown to have powerful effects on consumer choices and they appeal to a wide audience in their ability to navigate choice options (Quigley, 2013). The use of default settings is a nudging technique that increases the ease and convenience of desired behavior.

Currently, governments are looking into nudging techniques and are establishing nudge units to find ways how to incorporate behavioral science into their programs. Countries like the United Kingdom, Australia, Germany, United States and the Netherlands have been actively looking into nudging techniques since 2010 (Benartzi et al., 2017). Governments are interested in the fact how science concerning choice can slightly ‘nudge’ individuals into making life-improving decisions. Government is starting to give ‘nudges’ towards citizens by setting defaults of what may be an optimal standard for the average citizen. Successful examples of this technique have been found in stimulating organ donations and green energy (Van Dalen & Henkens, 2014).

Nudging techniques like default settings, differing in sustainable and unsustainable options can be used as a nudge to encourage a sustainable choice. Additionally, letting a default option become the choice is a very powerful nudging technique (Benartzi et al., 2017). The basic reason why default settings have such a powerful effect is that people do not have explicit preferences with respect to every imaginable product or service. Further, the default can help people act according to their preferences. It is important to note that Deng, Kahn, Unnava and Lee (2016) state that assortment design can also be used as nudge to influence purchasing behavior among consumers.

1.2 Horizontal and vertical displays

A fundamental visual cue that is adopted by many merchants and marketers to draw attention and influence behavior, just like nudges do, is the use of horizontal and vertical displays (Deng, Kahn, Unnava, & Lee, 2016; Romero & Biswas, 2016). Research has found evidence that horizontal and vertical displays can be seen as nudges that influence the choice of the consumer. For instance, in food context it has been found that presenting a healthy food option left (versus right) of an unhealthy food option can influence consumers' food choice (Romero & Biswas, 2015). Also, Deng et al. (2016) and Chae & Hoegg (2013) argue that horizontally displaying time-related products, like antiques or self-improvement products, can affect consumer choice and preference. Research found that when these products were displayed with past on the left and future on the right it influenced consumer choice (Chae & Hoegg, 2013).

Besides displaying products horizontally, research has also found evidence that displaying products vertically influences the choice and preferences of consumers. For instance, Deng et al. (2016) found that vertically displaying products on store shelves affects the preference and choice of products. Further, different shelf positions in stores affect consumers' brand evaluations (Chandon, Hutchinson, Young, & Bradlow, 2009). Top shelf positions attract more attention than lower shelf positions what in turn affects product preference and product choice (Chandon et al., 2009).

The reason why vertical and horizontal displays can influence product choice is due to the fact that consumers have mental representations in their minds. These mental representations are images presented in the minds of consumers and are also called mental imagery (Woolley & Wellman, 1993). Diverse studies have shown when mental representations or images are congruent (versus incongruent) with product displays, there will be a greater ease of processing (Chae & Hoegg, 2013). This can result to a positive attitude towards the product and perhaps influence choice (Reber, Schwarz, & Winkielman, 2004). Congruence means that something is compatible and in harmony with something else. So for instance, congruence derives when the consumers' mental representation of the product is compatible and in harmony with the display of these products. In contrary, incongruence occurs when the display of products is not compatible and in harmony with the consumers' mental representation. Research shows that displays congruent to consumers' mental representations create a greater ease of processing. Looking at the context of this research, it is expected that displays of sustainable products that are congruent (versus incongruent) with the consumers' mental representation should also result in easy processing. (Chae & Hoegg, 2013; Chandon

et al., 2009; Deng et al., 2016; Romero & Biswas, 2016). Accordingly, a higher likelihood of consumers choosing a sustainable product, will occur when the sustainable product is displayed according to the mental represented display patterns. These studies indicate that these visual cues can play an important part in influencing consumer choices. Visual cues can also be called nudges in this present research because they steer people to a certain behavioral choice.

Like mentioned, presenting a product horizontally or vertically in a way that is congruent (versus incongruent) with consumers' mental representations should create a greater ease of processing (Romero & Biswas, 2016). In this present research, horizontal and vertical displays are not presented as multiple products in a general horizontal or vertical manner. This current research specifies a horizontal display by placing a target product left (versus right) to a product opposite to the target and vertical display as placing a target product at the top (versus down) of a product opposite to the target. As a consequence, it is expected that this way of placement will achieve mental congruency. This research addresses the target product as a sustainable product and the opposite of the target product as an unsustainable product.

1.3 Scientific and societal relevance

The present research is important from both academic and practical perspective. The findings of this research increase the growing domain of visual marketing researches by illustrating how visual cues, like horizontal or vertical positioning of products, can influence choice. It computes to the amount of work that demonstrates effects of spatial location on consumer judgement. Further, investigating choice architecture and how it affects consumer behavior is a continuing concern for managers and policy makers. This research offers valuable practical implications for managers and policy makers with regard to stimulating more sustainable consumption choices among consumers. Furthermore, a better understanding of how choice architecture can ideally be created and implemented can in turn influence sustainable product choices what is important for the growing concern about the environment nowadays.

Previous research has shown on several occasions that placing products horizontally or vertically influences preference of consumers and their eventual choice. These researches have all been conducted in the food or in-store context (Chandon et al. 2007; Chae & Hoegg, 2013; Deng et al. 2016). However, the influence of horizontal or vertical product display has not been empirically demonstrated within the context of sustainable products, where consumers can choose between a sustainable and unsustainable product (displayed left versus right or top versus down from each other). Additionally, this research looks at on-screen positioning during

online shopping situations which differs from the in-store and food context. This is relevant because it is expected that the growth of e-commerce will grow like never before with all the current technologies. Also, the rate of online shopping has increased over the years and among 17 million people living in the Netherlands 84 percent is considered an online shopper (Eurostat, 2018). This present research focuses on how to assemble a choice architecture on screen, with default product settings in a way that will foster a sustainable product choice in the end. How to design choice architecture on screen, that will foster a more sustainable consumption, is a field of research that is not well explored yet. This research fills this gap, assuming that the influence of placing a sustainable product left (versus right) or top (versus down) of an unsustainable product, can lead to an increased preference of sustainable products. Also, there is a bulk of research examining the effects of vertical and horizontal display on consumer preferences independent from each other. This research looks at the effect of these two choice architectures together.

As a result of studying the context of this present research, it is expected that horizontal displays will be easier to process. This as a result of a match between the horizontal human binocular vision field, and the dominant direction of eye movements required for processing horizontal displays (Deng et al., 2016). Therefore, it is expected that displaying a sustainable product left (versus right) of the unsustainable product will create a larger preference for the sustainable product than displaying a sustainable product top (versus down) of the unsustainable product. This will be further addressed in the next chapter.

In sum, due to the growing interest in sustainability and the pressure from society and government to make sustainable choices, it is relevant to investigate how we can put together choice architectures that nudge and influence consumers in making a sustainable product choice. This research tries to map whether horizontally or vertically displaying products will result in a preference of the sustainable product. Horizontal display means positioning a sustainable product left or right of the unsustainable product and vertical display means positioning a sustainable product below or above the unsustainable product. Besides, this research looks at which one of the two display options will lead to an increased preference of the sustainable product. This leads to the following research question:

RQ: What are the effects of positioning a sustainable product left (versus right) or top (versus down) of an unsustainable product by using default product options and which positioning will result in a preference of the sustainable product choice?

2. Theoretical Background

As mentioned in the previous chapter, positioning a sustainable product left versus right or top versus down of an unsustainable product can influence consumer choice and preference. This chapter illustrates how the two different displays in a horizontal or vertical way could lead to a sustainable product choice. Further, in this research there will be examined which effect will be expected to be more substantial.

2.1 Display & Processing Fluency

Previous research has illustrated considerable ways in which product display can influence consumer choice and preference. Like mentioned in the first chapter, this depends on whether a display is congruent (versus incongruent) to the natural mental representation of consumers (Chae & Hoegg, 2013). When images are displayed congruently (versus incongruently) with consumers' mental representation, they are processed with more ease what results in a favorable product evaluation (Chae & Hoegg, 2013). This in turn can influence consumer choice and judgement (Chae & Hoegg, 2013). This ease of processing is called processing fluency (Chae & Hoegg, 2013; Reber, Schwarz, & Winkielman, 2004). Processing fluency is defined as *'the subjective experience of the ease and speed with which an incoming stimulus is processed'* (Orth & Wirtz, 2014, p. 298).

The more fluently consumers process a product, the more positive their response and evaluation (Reber et al., 2004). Research about processing fluency insinuates people judge objects on their subjective feelings of ease or difficulty that they encounter when they process information about the objects. According to Reber et al. (2004) the ease of processing fluency encourages positive judgement. When a product is processed fluently there can be spoken of high fluency. This process occurs when a product is congruent to a consumer's mental presentation. High processing fluency may evoke positive affect since it is associated with progress toward successful recognition of the stimulus, fault-free processing, or the feeling that suitable knowledge structures are available to interpret the stimulus (Reber et al., 2004). As soon as a product is processed with more difficulty and complication, there can be spoken of low processing fluency. This process occurs when a product is incongruent with a consumer's mental representation.

Consequently, when a consumer's mental representation of a product matches the way the product is displayed, the match increases processing fluency. This in turn influences product preference and choice. In this research processing fluency is seen as the mediator

between positioning of the sustainable product (left versus right or top versus down) against the unsustainable product and product choice. To elaborate this processing fluency and to examine why consumers experience a match between certain products, the processing of horizontal and vertical displays will be described. This will be done accordingly by studying literature regarding visual display cues. Lastly, there will be explained which choice architecture is expected to work better in the context of this research.

2.2. Horizontal Directionality

As mentioned, consumers can experience congruence during visual processing of horizontal visual stimuli. This creates a high processing fluency and in turn can influence their choice (Chae & Hoegg, 2013; Chandon et al., 2009; Deng et al., 2016; Romero & Biswas, 2016). According to the theory of spatial representation of magnitude, it can be explained how consumers experience a match and as result experience congruence. This in turn develops processing fluency among consumers. By means of this theory, people's tendency to mentally map increases in magnitude from left to right (Johnson-Ulrich & Vonk, 2018; Romero & Biswas, 2016) .

The theory of spatial representation of magnitude states the propensity for humans to respond faster to relatively smaller numbers on the left and larger numbers on the right (Johnson-Ulrich & Vonk, 2018). Besides number magnitude, other dimensions such as time duration and spatial extent are also mentally organized with their magnitude increasing from left to right. When these dimensions are presented in congruence with participants' mental representation, it creates a faster response (Romero & Biswas, 2016). Several researches have been conducted concentrating on visual display in this left-right domain. For instance, in the context of food, where Romero & Biswas (2016) examined how a horizontal display of healthy food items to the left versus unhealthy items to the right, influenced a healthy food choice. In line with the theory of spatial representation of magnitude, healthy items are perceived to be less heavy and include less calories, not as filling and not as tasty than unhealthy items (Romero & Biswas, 2016). Because stimuli of lower magnitude are usually mentally organized on the left and those with more in magnitude on the right, consumers naturally represented healthy items on the left of unhealthy items (Romero & Biswas, 2016). As a consequence, consumers experienced congruence which increased processing fluency resulting in a preference of healthy food. The same can be done in the context of sustainable product choice options.

In line with the theory of spatial magnitude, sustainable products are seen as ‘lighter’ in comparison with unsustainable products. The reason why sustainable products are seen as ‘lighter’ is because sustainable products are seen as ‘healthy, green and good choices’ for the planet (Black & Cherrier, 2010). Furthermore, sustainable choices promote the health of the planet just like healthy food choices promote the health of the body. Romero and Biswas (2016) provide evidence for the theoretical claim that lighter and healthier options are mentally represented on the left and unhealthy heavier options on the right. In line with their research it is expected when a sustainable choice is presented left of an unsustainable choice, it will lead to preference of the sustainable option. This as a result of the experienced fit, also called congruence, with the mental representation of the consumer. Because of the experienced congruency there will be high processing fluency what in turn will lead to a preference of the sustainable option.

H1: Placing a sustainable product left (versus right) of an unsustainable product, will result in higher processing fluency, increasing preference of the sustainable product choice.

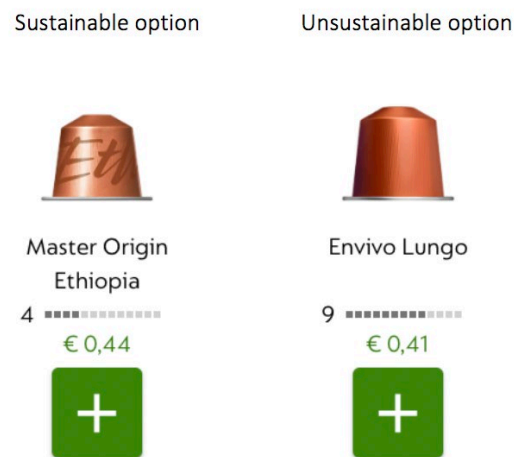


Figure 1. choice architecture displaying a sustainable product left (versus right) of an unsustainable product

2.3 Vertical Directionality

Vertical display of stimuli or objects can also influence consumers' choice (Chae & Hoegg, 2013; Chandon et al., 2009; Deng et al., 2016). Valenzuela and Raghurir (2008) found that consumers tend to process visual information according to the inferences they make when they

see a vertical display. Research considering eye-movement advocate that not all locations of product display draw equal attention. As a consequence this can create inferences (Chandon et al., 2009). Consumers tend to make position inferences when they see a vertical display, meaning that a more positive product evaluation was found on the top shelf and a negative product evaluation on the lower shelf (Valenzuela & Raghurir, 2008; Kerckhove et al., 2015). This can be explained because consumers expect the best quality products to be on the top shelves and the lowest quality products on the lower shelf (Chandon et al., 2017; Valenzuela & Raghurir, 2008; Kerckhove et al., 2015). Additionally, consumers choose other products when they look up versus down (Kerckhove et al., 2015). Furthermore, Drèze, Hoch and Purk (1994) also found strong effects for vertical product positioning, in which the finest level is near the eye level and the worst level is on the lowest level. As an illustration, Valenzuela and Raghurir (2008) instructed consumers to choose a bottle of wine. Consumers chose the brands positioned at the top or middle of the vertical displays when seeing unfamiliar wines. Therefore, it is expected that when products are positioned near the top middle vertical position this will positively influence product choice. Besides product quality inferences, also the products visual weight can influence consumers product choice.

According to the theory of spatial representation of magnitude, the location of a product can determine the products visual weight (Deng et al., 2016). The products shown at the top of a display can be seen as ‘light’ and products shown at the bottom of a display can be seen as ‘heavy’. This is due to consumers vertical axis in consumer mental representation. According to Deng et al. (2016) heavy objects are anchored on the ground, while objects of little weight go upward. As mentioned, in line with the theory of spatial magnitude, sustainable products in comparison with unsustainable products are perceived as ‘lighter’. Therefore, as soon as sustainable products are presented on the top, this will be in line with consumers mental representation, they will experience congruence and a high processing fluency resulting in a preference for the sustainable choice. Also, consumers make quality inferences about the top position of a product, which in turn influences the preference of the sustainable product.

H2: Placing a sustainable product on top (versus down) of an unsustainable product, will result in higher processing fluency, increasing preference of the sustainable product choice.

Sustainable option



Master Origin
India

11 *****

€ 0,44



Kazaar

12 *****

€ 0,41



Unsustainable option

Figure 2. choice architecture displaying a sustainable product top (versus down) of an unsustainable product

2.3 Horizontal display stronger

As soon as consumers are confronted with product displays, they visually process the displays in seconds (Deng et al., 2016). Research shows that horizontal displays are processed easier than vertical displays (Deng et al., 2016). This can be elaborated according to different explanations.

Firstly, high processing fluency of assortment information occurs when consumers make horizontal eye movements (Deng et al., 2016). This is because our vision is wider in the horizontal direction as a consequence of the fact that humans view the world through a binocular vision field (Deng et al., 2016). A binocular vision is the capability of maintaining a visual focus on an object with both eyes creating only one visual image. Humans' forward-facing eyes give a horizontal field of view of about 120° maximum (Deng et al., 2016). For instance, the design of televisions, computer monitors, and other screen-based products closely mimic the shape of this human's binocular vision. These screen-based products facilitate the visual processing of horizontal information due to their shape, and thus make horizontal eye movement easier resulting in a higher processing fluency (Deng et al., 2016). In addition,

horizontal display facilitates the perceptual span, meaning that horizontal scanning goes more fluently than vertical scanning (Deng et al., 2016; Rayner, Slattery, & Bélanger, 2010). Perceptual span is the angular span (vertical or horizontal), within which the human eye has a sharp enough vision to perform an action accurately (Rayner et al., 2010).

Further, horizontal scanning requires less physical effort than vertical scanning (Deng et al., 2016). This as a result of the muscles that control horizontal eye movement, which appear to be stronger than those controlling vertical eye movement (Deng et al., 2016). Also, it takes more muscular energy and effort to lift our eyes and head, and scan a display vertically (Van Kerckhove, Geuens, & Vermeir, 2015). This suggests that vertical eye movements while scanning a vertical display are more effortful.

As a consequence, horizontal eye movements due to horizontal display are expected to be more fluent. Therefore, it is predicted that horizontal display will create a higher level of processing fluency versus a vertical display, which in turn creates a stronger effect for the horizontal display and the preference of the sustainable product choice. Even though there is research stating that vertical product display has a greater impact on the influence of consumer choice (Chandon et al., 2009; Valenzuela & Raghubir, 2008). It is expected that in the context of this research, where the research is focused on default product customization settings in an on-screen context, horizontal product displays will have a stronger effect than vertical product displays on consumer choice.

H3: Placing a sustainable product left (versus right) of an unsustainable product, will result in higher processing fluency and in turn have a stronger effect on the preference of the sustainable product than placing a sustainable product top (versus down) of the unsustainable product.

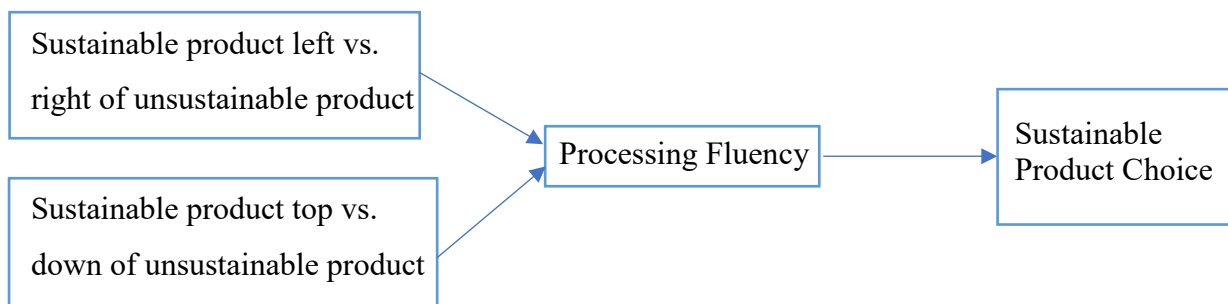


Figure 3. Conceptual Model Research

3. Methods

This research tries to examine the effect of horizontal versus vertical display of products differing in terms of sustainability and examines which visual display will result in a preference of the sustainable product. It is expected that displaying a sustainable product at the left-hand side (versus right) of an unsustainable product, will nudge consumers into a sustainable product choice. It is also expected that displaying a sustainable product at the top (versus down) of an unsustainable product will result in a sustainable product choice. Processing fluency is seen as mediator between horizontal versus vertical display and the product choice of the consumer. Further, it is expected that horizontal product display will have a stronger effect on consumer choice than vertical product display. Based on the research question, an experimental design was chosen. Experimental designs are used to test hypotheses concerning causal relations, which is the case in this study (Wester, Renckstorf & Scheepers, 2006). In this chapter the methods applied in this thesis will be explained.

3.1 Research method

This research is a between-subjects design because the participants either experienced vertical display (top versus down) or horizontal display (left versus right). This study adopts one factor which is the visual display of the products. This factor has four manipulated levels, to start with the sustainable products displayed left versus right of the unsustainable products and the sustainable products displayed at the top versus down of the unsustainable products and vice versa. The participants were divided by means of random allocation, which ensures that each participant has equal chance of being assigned to one group or the other (Westers, Renckstorf & Scheepers, 2006). Table 1 gives a complete overview of the research design and the distribution of conditions.

This current research is a manipulated experiment conducted through an online questionnaire. As a consequence, primary data were analyzed. During the main experiment participants were exposed to different sustainable products (e.g. fair-trade coffee, sustainable straw and refillable water bottle) and unsustainable products (e.g. regular coffee, plastic straw, plastic water bottle). Appendix A provides details about the displayed products during the experiment. After the exposure participants were asked to answer questions. To establish ecological validity during the experiment, the horizontal and vertical displays presented on the computer or mobile screen were similar to real online shopping situations.

Table 1

Research design and conditions

Conditions	visual display		visual display
Condition 1			
$n = 33$	left sustainable	vs.	right unsustainable
Condition 2			
$n = 32$	right sustainable	vs.	left unsustainable
Condition 3			
$n = 29$	top sustainable	vs.	bottom unsustainable
Condition 4			
$n = 34$	bottom unsustainable	vs.	top sustainable

3.2 Pretests

Two pretests were conducted to be able to construct the main questionnaire for the manipulated experiment. The first pretest verified how many products should be displayed horizontally or vertically in the main questionnaire. Furthermore, the second pretest verified if the products were perceived as sustainable or unsustainable. Pretesting is an essential step in the survey development process and helps increase validity and reliability of the actual survey (Field, 2006).

3.2.1 Pretest processing fluency

The first pretest was conducted to test if processing fluency occurred after being exposed to two, six or eight products ($N = 38$; average age = 26.1; 36.8% female versus 63.2% male). It was expected that displaying two products would always lead to high processing fluency. This because two products are usually easy to process. Therefore, in interest of finding out how many products should be displayed during the main research, this pretest was conducted. All of these displays contained sustainable products presented either on the left side, right side, at the top or bottom versus unsustainable products on the opposite side.

Processing fluency was questioned with *'how easy did you find it to visually process the display?'* and rated on a 5-point Likert Scale (1 = very easy; 2 = easy; 3 = neither easy nor uneasy; 4 = uneasy; 5 = not easy at all). Further, processing fluency was questioned with *'how difficult would you find the task to describe this display at a later point in time?'* and *'how difficult is it for you to visualize this display with your eyes closed?'*. This was also rated on a

5-point Likert Scale (1 = very difficult; 2 = difficult; 3 = neutral; 4 = not difficult; 5 = not difficult at all).

Before the analysis of the pretest, variables from the questions ‘*how difficult would you find the task to describe this display at a later point in time?*’ and ‘*how difficult is it for you to visualize this display with your eyes closed?*’ were recoded. This was done for the variables Q6 into PFdifficult2, Q35 into PFlater2, Q33 into PFdifficultrec6, Q7 into PFlater 6, Q34 into PFdifficultrec8 and Q36 into PFlater8. Reliability analysis was conducted to check the internal consistency of the constructs. New variables were computed into ‘PF2, PF6 and PF8’ and all divided by 3 so the means scores were adopted. See table 2 for the mean, standard deviation and Cronbach’s alpha of the variables.

Before the analysis of the pretest, it was decided by the researcher that displaying eight products horizontally or vertically in the main research questionnaire will not fit the screen of the mobile or laptop correctly. Participants will have to scroll down too much during the experiment, or the products will be poorly readable resulting in unreliable results. Therefore, it was decided to only look at the amount of processing fluency between two or six products.

A one tailed -sample t-test revealed if the two products or six products had a significant difference with each other regarding processing fluency. This was the case, PF2 and PF6 had a significant difference ($t(36) = -10.622, p = .00$). Furthermore, according to the mean concerning processing fluency of six products, people experienced processing fluency as neutral, or neither easy nor uneasy. Therefore, it was decided to display six products horizontally and vertically during the main experiment. Appendix B contains the pretest concerning processing fluency.

Table 2

Mean, standard deviation and Cronbach’s Alpha fluency pretest

Construct	N of items	Mean	St. dev.	Cronbach’s alpha
Visual processing 2 products	3	1.94	.60	.63
Visual processing 6 products	3	3.50	.67	.71
Visual processing 8 products	3	3.89	.74	.53

3.2. 2 Pre-test perceived sustainability

A second pretest was conducted to ensure the sustainability and unsustainability of items displayed in the main questionnaire ($N = 32$; average age = 24.5; 75% female versus 25% male). The perceived sustainability and unsustainability of the sixteen products was questioned

by asking the respondents *'How sustainable do you find this product?'* The perceived sustainability of the products was rated on a 5-point Likert Scale (1 = very sustainable; 2 = somewhat sustainable; 3 = neutral; 4 = not very sustainable; 5 = not sustainable at all).

Due to the pretest being a within subject's design, an one-tailed sampled t-test was performed. During the pretest eight product categories were shown that contained sixteen products in total. These products were randomized so the respondents could not figure out the goal of the research. The one-tailed sample t-test revealed if the two products from each product category had significant difference with each other regarding their perceived sustainability. This was the case for all the product categories. See table 3 for the results of the t-test, means and standard deviations. The results from the pretest helped determine sustainable and unsustainable product categories for the main experiment.

The main experiment displayed categories 'coffee', 'straws' and 'water bottles'. Products from the same category were added to the questionnaire. This is justifiable because the pretest showed that these products within these categories differed significantly regarding their perceived sustainability and were seen as sustainable. Only three product categories were chosen for the main survey due to the fact that the survey would be too long if more products would be added and this in turn could influence results. The pretest measuring perceived sustainability of the products can be found in Appendix B.

Table 3

t-test results pretest, mean and standard deviation perceived sustainability products

Product	Mean	SD	T	df	p
<u>Category coffee</u>					
Douwe Egberts coffee	3.22	.980			
Fair Trade Original coffee	1.53	.67	7.93	31	.00
<u>Category water bottles</u>					
Plastic water bottles	4.66	.65			
Refillable water bottles	1.44	.84	-17.02	31	.00
<u>Category chocolate</u>					
Milka Chocolate	3.97	.59			
Tony Choclonely	1.72	.68	-12.94	31	.00
<u>Category energy source</u>					
Coal for enery	4.22	1.04			
Solar panels	1.25	.44	-14.26	31	.00
<u>Category light bulbs</u>					
Regular light bulbs	4.12	.81			
Energy saving lamp	1.81	.83	-8.67	30	.00
<u>Category heaters</u>					
Patio heaters	4.47	.79	-8.02	31	.00
Heated cushions on battery	2.22	1.29			
<u>Category batteries</u>					
Regular battery	3.84	.86			
Rechargeable battery	1.90	.87	-11.18	30	.00
<u>Category straws</u>					
Plastic straws	4.91	.29			
Reusable straws from stainless steel	1.81	1.12	-14.57	31	.00

3.3 Respondents

For the main study 128 participants took part in the experiment. The average age was 25 and was found in the range from 25 years – 34 years old ($M = 4.03$; $SD = 1.22$). From the research

population ($N = 128$) 42.2% were male and 57.8% were female. Furthermore, the level of education was included. The majority of the respondents consisted of Dutch highly educated men and woman. 'Highly educated' means that participants are currently following or have followed a graduate or master's degree (78%). The survey was distributed in English and Dutch to maintain the cross-cultural validity. However, only 3% from the participants had another nationality than Dutch.

A convenience sampling strategy was used to recruit participants for this research. Convenience sampling relies on data collection from members who are conveniently available to participate in the study (Wester, Renckstorf & Scheepers, 2006). For this current research, participants were recruited through messages on social media and from the researchers own network. Convenience sampling strategy can create possible bias in data due to participants coming from a specific group and not the whole population. This makes it harder to generalize results and creates a higher probability of a sampling error occurring. On the other hand, due to budget and time constraints this was the only option to recruit participants in a sufficient matter. Further, convenience sampling helps to gain initial primary data about this research topic and can serve as a pointer for further research.

3.4 Procedure

The research was conducted through an online questionnaire from 30th April until the 8th of May 2019. The experiment was carried out through an online software program called 'Qualtrics'. Respondents could conduct the research at home or on their mobile phone at any preferred location. The vertical and horizontal displays were made to fit the displays of the computer, so participants did not have to scroll left, right, up or down to view the products. However, the participants who filled in the questionnaire on their mobile phone did have to scroll to view the display on their mobile screen. The participants went through the experiment individually. The average time a participant conducted a survey was seven minutes. Participants were told to view the assortment of products as if they were online shopping. Before the survey started, the participants were obliged to give permission to participate in the experiment. As soon as the participant digitally agreed with the general conditions of the experiment, the participant could start the questionnaire.

The participants were evenly and randomly assigned to either four of the conditions, namely 1) sustainable products left versus unsustainable products right, 2) unsustainable products left versus sustainable products right, 3) sustainable products top versus unsustainable

products down and 4) unsustainable products top versus sustainable products down. The first part of the questionnaire contained a short introduction and thereafter the participants were exposed to the product assortments. The sort of product assortment participants were exposed to depended on the condition participants were assigned to. The participants were told to view the products as if all the prices were equivalent. They were asked to select one product that they would like to buy if they were online shopping. After the participants chose a product, they were asked a series of questions that measured their processing fluency. Finally, questions about their attitude towards environment, sustainable products and general demographic information was asked. The research ended with a page of gratitude to thank the participants for their participation. The participants could fill in their e-mail address if they were interested in the results. See appendix C for the questionnaire of the experiment.

3.5 Stimulus material

During the main experiment the participants were exposed to five choice situations. Three choice situations between 1) sustainable and unsustainable coffee 2) sustainable and unsustainable straws 3) sustainable refillable water bottles and unsustainable plastic water bottles. Furthermore, the participants were asked to choose between different pizzas and designer cushions, so the participants were not able to guess the aim of this research. Appendix A presents the different products the participants could choose from. Figure 3, 4 and 5 show screenshots from the online shopping displays. The images were obtained from google.nl and edited by the researcher through Photoshop. Brands and labels were wiped away through Photoshop so the respondents would not be influenced by certain brands or labels.

Figure 4. Screenshot from horizontal display product category coffee

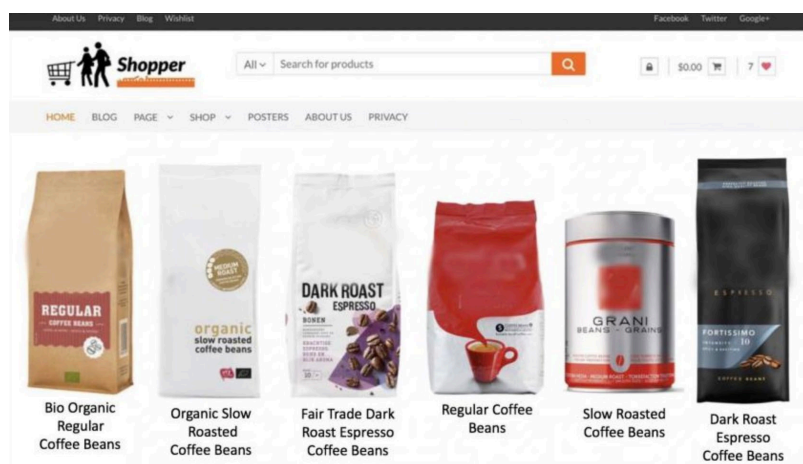


Figure 5. Screenshot from the horizontal display product category straws

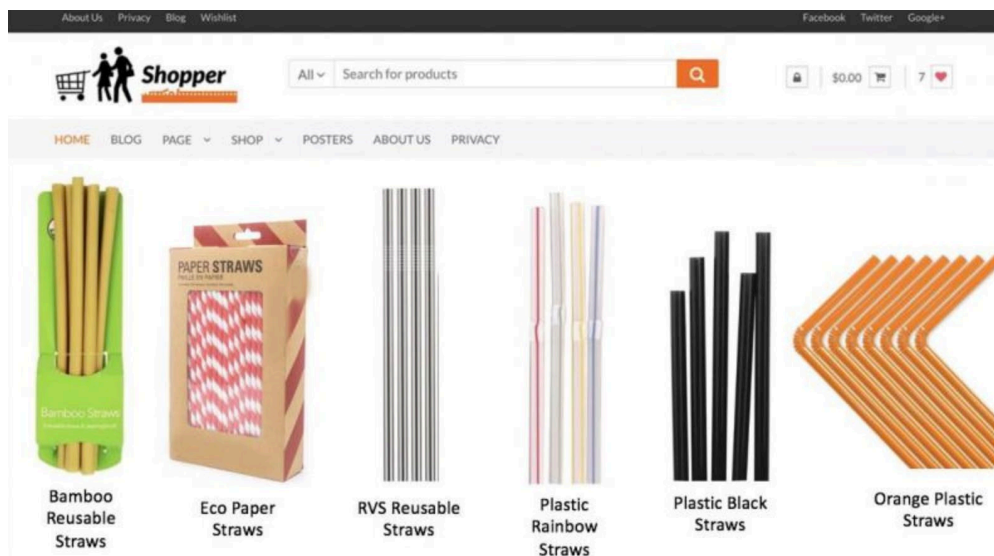
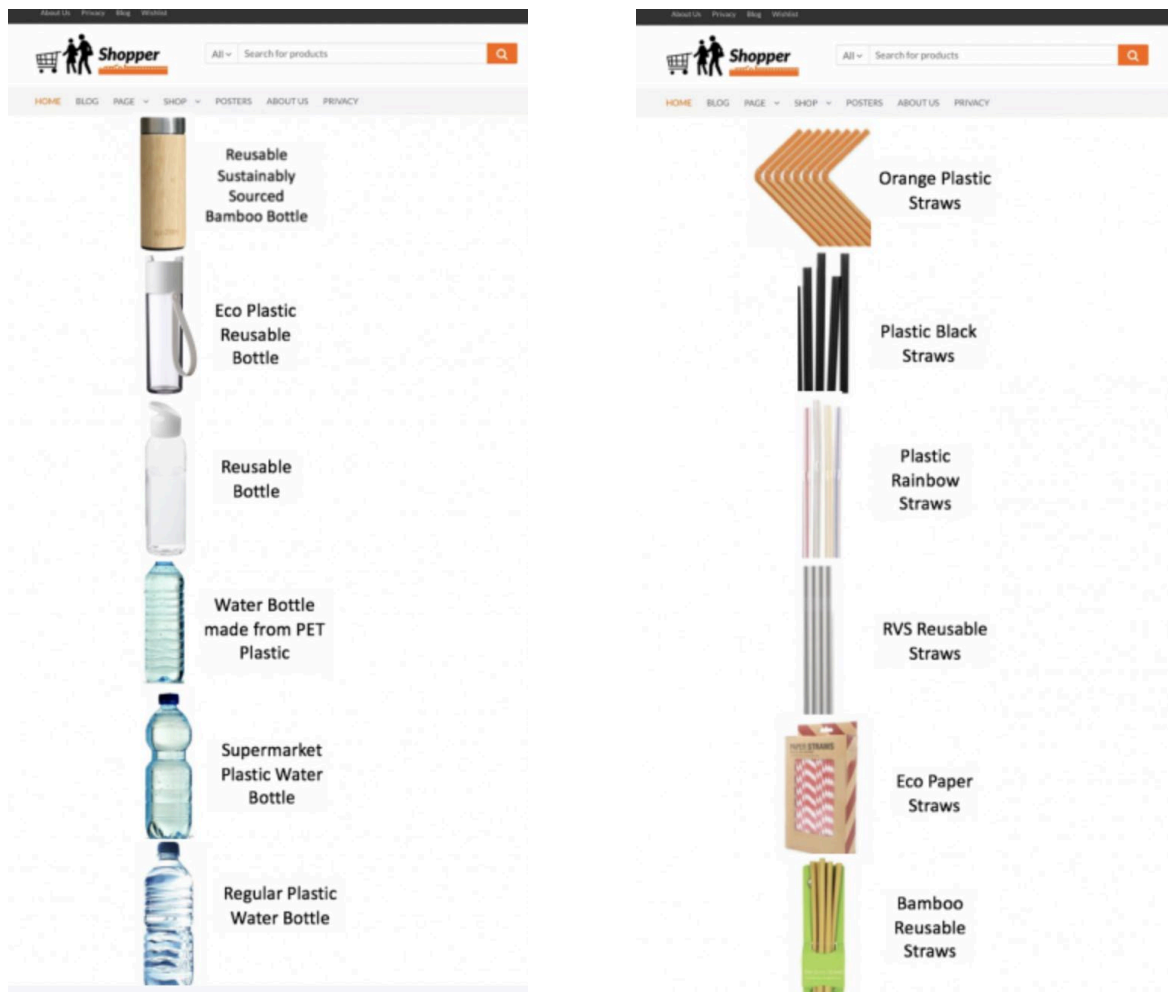


Figure 6. Screenshot from the vertical display water bottles and straws



3.6 Measurement instruments

To test the conceptual model different concepts were operationalized. To start with the dependent variable consumer choice, which could be either a sustainable or unsustainable product choice. Further, the mediating variable processing fluency and several control variables. In the following section the operationalizations of the variables will be addressed.

3. 6. 1 Independent variable

Visual Product Display. Like mentioned in the former paragraphs, a visual product display is presented either vertically or horizontally, which means that a sustainable product will be left versus right of an unsustainable product, or a sustainable product right versus left of an unsustainable product, or a sustainable product top versus down of an unsustainable product and lastly an unsustainable product top versus down of a sustainable product.

3.6.2 Mediator

Processing fluency. The variable processing fluency was the ease and speed of processing the participants experienced when they were exposed to the horizontal or vertical product displays. This variable is measured with a measurement instrument applied in the research of Landwehr, Labroo and Herrmann (2011). Processing fluency was measured in this present research after respondents were exposed to the five different shopping situations. The following three items measured processing fluency: '*How easy did you find it to visually process the display?*'. This question was measured on a five-point Likert scale (1 = 'Very easy'; 2 = 'Easy'; 3 = 'Neither Easy nor Uneasy'; 4 = 'Uneasy'; 5 = 'Not easy at all'). Also, '*How difficult is it for you to visualize this display with your eyes closed?*' and '*How difficult would you find the task to describe this display at a later point in time?*' were asked and measured on a five-point Likert scale (1 = 'Very difficult'; 2 = 'Difficult'; 3 = 'Neutral'; 4 = 'Not difficult'; 5 = 'Not difficult at all'). The answers from the cushions and pizzas were deleted because they do not cover the goal of this research. The remaining answers concerning processing fluency of straws, water bottles and coffee were adopted in the main analysis.

3. 6. 3 Dependent variables

The product choice of consumers. The product choice of consumers is whether the respondent made a sustainable or unsustainable product choice.

3. 6. 4 Control variables

Demographic variables. The last section of the questionnaire contained demographics of the participants. For instance, their gender (man/female) and age. Further, their level of education was asked '*What is your highest degree or school level you have completed?*' (1 = secondary education; 2 = mbo ; 3 = hbo (bachelor) ; 4 = hbo (master) ; 5 = wo (bachelor) 6 = wo (master); 7 = Doctorate or PhD).

Attitude towards sustainable products. Further, the participants' attitude towards sustainable products was measured. First, the perceived environmental benefit of sustainable products was questioned. This was measured with a three-item scale developed by Chang (2011). Attitude toward sustainable products and their perceived environmental benefits was measured with: '*Green products are good for the environment*', '*Green products cannot help slow the deterioration of the environment*' and '*Green products can effectively reduce pollution*'. These questions were measured on a five-point Likert scale (1 = 'Strongly Agree'; 2 = 'Agree'; 3 = 'Neither agree nor disagree'; 4 = 'Disagree'; 5 = 'Strongly disagree').

Cost evaluation of sustainable products. Furthermore, the degree in which participants believed sustainable products were more expensive than unsustainable products was measured. This was measured with a three-item scale developed by Chang (2011). The questions stating: '*Green products are expensive*', '*Green products cost more than non-green products*' and '*Green products are cheaper than non-green products.*' These questions were measured on a five-point Likert scale (1 = 'Strongly Agree'; 2 = 'Agree'; 3 = 'Neither agree nor disagree'; 4 = 'Disagree'; 5 = 'Strongly disagree').

Additionally, to measure the number of participants who care about the environment and sustainable products in general, two questions were asked with a scale ranging from 0 (not at all) to 100 (a great deal). Firstly, '*how much do you care about the environment?*' and secondly, '*how much do you care about sustainable products?*'.

Medium. As result of the questionnaire being conducted through a computer, laptop or mobile phone, there was also questioned '*what medium did you use to fill in this questionnaire?*'.

3.7 Factor Analyses

This research made use of multi item scales and therefore factor analyses were performed to determine the dimensions. To start with the items measuring processing fluency. As a result of processing fluency being an established scale from former research, a common factor analysis (CFA) was conducted. The eigenvalue greater than one criterion and scree plot indicated three dimensions. An orthogonal factor rotation (Varimax) was chosen because it was expected that there would be a difference between the items and no correlation would occur. Firstly, the Kaiser-Meyer-Olkin (KMO) measure exceeded the threshold of .50 (KMO = .736). According to Field (2013) this means that the sample adequacy of the analysis is verified because it is above the threshold of [.50]. Furthermore, the Bartlett's Test of Sphericity was significant, meaning that factor analysis is an appropriate analysis to perform ($\chi^2(36) = 544.902, p < .000$ (Field, 2013). The factor analysis extracted 3 factors with an eigenvalue above 1 and a cumulative explained variance of 63.75%. Further, the communalities were examined, and it was concluded that they all exceed the threshold of [.20]. Furthermore, the rotated factor matrix showed that all the factor loadings exceed the minimum level of [.30]. Therefore, no items were deleted, and 3 dimensions were formed. Table 4 presents the factor loadings and communalities of the factor analysis concerning processing fluency.

Table 4

Factor analysis processing fluency (N = 128)

	Factor			Communalities
	1	2	3	
PFbottle1	.679			.548
PFbottle2	.959			.965
PFbottle3	.705			.597
PFstraw1		.689		.495
PFstraw2		.930		.871
PFstraw3		.895		.811
PFcoffee1			.422	.234
PFcoffee2			.752	.607
PFcoffee3			.731	.609

Subsequently, a reliability analysis was performed to validate the internal consistency of the nine items (Hair, Black, Babin, & Anderson, 2010). The reliability was assessed for the constructs by calculating the Cronbach's alpha. To reach a sufficient reliability the required

threshold of the coefficient is $>.60$ and the desired threshold is $>.70$. The Cronbach's alpha confirmed the internal consistency of the constructs with a Cronbach's alpha of $.710$. Therefore, it can be concluded that indeed these nine items measure the concept of 'processing fluency' and have a high internal consistency. These nine items were conducted into one variable 'total processing fluency' by summing scores of the items and divided by nine. The variables PFcoffee, PFstraws and PFbottle were created and the scores of processing fluency in relation to the product were summed and divided by 3. Table 5 presents the descriptive statistics of total processing fluency and the processing fluency per product category.

Table 5

Mean, standard deviation and Cronbach's alpha processing fluency variables

	Mean	Standard deviation	Cronbach's Alpha
Total processing fluency	2.97	0.53	.710
Processing fluency coffee	2.69	0.82	.700
Processing fluency straws	3.08	0.96	.863
Processing fluency bottle	3.14	.996	.861

Furthermore, a factor analysis was performed for the multi item scales measuring attitude and cost evaluation towards sustainable products. As result of applying established scales, a CFA was conducted with an orthogonal factor rotation (Varimax). Firstly, the Kaiser-Meyer-Olkin measure exceeded the threshold of $.50$ ($KMO = .572$). Furthermore, the Bartlett's Test of Sphericity was significant, ($\chi^2 (15) = 74.047, p < .000$ (Field, 2013)). The factor analysis extracted one factor with an eigenvalue above 1 and a cumulative explained variance of 33.02% . Further, the communalities were examined, and it was concluded that GPdeteriorationrev needed be deleted due to a low communality ($<.20$). Subsequently, a CFA was performed without GPdeteriorationrev. The Kaiser-Meyer-Olkin measure exceeded the threshold of $.50$ ($KMO = .532$) and the Bartlett's Test of Sphericity was significant, ($\chi^2 (10) = 63.414, p < .000$ (Field, 2013)). The factor analysis extracted one factor again with an eigenvalue above 1 and a cumulative explained variance of 37.51% . Further, the communalities were examined, and it was decided to delete Greenproductcheaprev due to low communalities. However, after The CFA was performed without Greenproductcheaprev the KMO was insufficient ($<.50$) and a factor analysis could not be performed. It was decided to keep this variable in the analysis due to the required threshold. Table 6 presents factor loadings of the control variables.

Table 6

Factor analysis control variables (N = 128)

	Factor		Communalities
	1	2	
Greenproductcheaprev	.358		.141
Greenproductexpensive	.696		.484
Greenproductcostmore	.423		.182
Greenproductgoodenvironment		.738	.558
Greenproductsreducepollution		.713	.510

New variables were made for attitude towards sustainable products and perceived cost toward sustainable products. The items greenproductgoodenvironment and greenproductreducepollution were conducted into one variable ‘total perceived environment’ and the items greenproductrev, greenproductexpensive, greenproductcostmore were conducted into one variable ‘total perceived cost’, by summing scores and diving by three. Table 7 presents the means, standard deviations and Cronbach’s alpha of total perceived environment ant total perceived cost.

Table 7

Mean, standard deviation and Cronbach’s alpha total perceived environment and cost

	Mean	Standard deviation	Cronbach’s Alpha
Total perceived environment	3.67	0.69	.690
Total perceived cost	3.80	0.778	.471

3.8 Plan of analysis

The data were gathered through Qualtrics and the analysis was done by using SPSS. A logistic regression was chosen due to the binary (two-group) categorical dependent variable regarding a sustainable or unsustainable choice (Hair et al., 2010). Before the dataset could be analyzed and hypothesis could be tested, the data had to be prepared to the appropriate format of the analysis. There were no missing data because force response was programmed and there were no outliers due to fixed choices in the questionnaire. New variables were created from the data. See table 8 presenting the variables created for the analysis.

Table 8

Created variables and their significance

New Variable	Significance
Condition-H	Presents two horizontal display conditions: <ul style="list-style-type: none"> - sustainable left versus unsustainable right - unsustainable left versus sustainable right
Condition-V	Presents two vertical display conditions: <ul style="list-style-type: none"> - sustainable top versus unsustainable down - unsustainable top versus sustainable down
Condition-LT	Presents the conditions: <ul style="list-style-type: none"> - sustainable left versus unsustainable right - sustainable top versus unsustainable down
PFstraw	Processing fluency experienced while being exposed to the straw choice situation
PFcoffee	Processing fluency experienced while being exposed to the coffee choice situation
PFbottle	Processing fluency experienced while being exposed to the water bottle choice situation
Choicestraws	Product choice after straw choice situation
Choicecoffee	Product choice after coffee choice situation
Choicebottles	Product choice after water bottle choice situation
Productchoicetotal	Total product choice between sustainable and unsustainable options

The product choices of the consumers considering ‘choicestraws, choicecoffee and choicebottles’ were coded with 0 (= sustainable product choice) and 1 (= unsustainable product choice). Subsequently, total product choice was coded with 0 (= sustainable product choice) when the participant chose 2 out of 3, or all 3 times a sustainable product. In contrary, a choice was coded as 1 (= unsustainable product choice) when the participant did not choose the sustainable product or only chose a sustainable product once during the 3 buying situations. The variable was named ‘productchoicetotal’.

Z-scores were made to standardize the interval variables to the same scale. All interval variables were standardized to a Z-variable to create product terms, giving them an average of 0 with a standard deviation of 1 (Field, 2013). This created the variables ‘z_perceived_environment, totalcost_z, z_attitude_products, z_attitude_environment, zPFcoffee, zPFstraw, zPFbottle, zPFtotal’. These z-scores were used in the analysis.

Afterwards, in order to check whether the randomization was successful, conditions were correlated with demographic variables gender, age and level of education. This made clear whether the conditions were equally divided regarding age, gender and level of education. To start with, age and education were split at the median to create two groups with low and

high values. For age, respondents below 25 were coded 0 and respondents above 25 were coded 1. For education, respondents with a degree below hbo were coded as 0 and above hbo were coded as 1. Due to the categorical nature of the variables, a Chi-square test of independence was performed comparing the conditions with age, gender and educational level. It can be concluded that the conditions did not differ by age, $\chi^2(3, N = 128) = 1.558, p = .669$ and by educational level $\chi^2(3, N = 128) = 7.020, p = .071$. However, a significant relationship was found between conditions and gender $\chi^2(3, N = 128) = 7.992, p = .046$, meaning that the conditions differ by gender. This can be due to the fact that more female participants participated in the research than male participants.

Subsequently, an independent t-test was performed which applied the same groups regarding age, education and gender in relation to mediator 'processing fluency' and the dependent variable 'total product choice'. Table 9 presents the results of the independent t-test. No significant relationships were found and therefore it can be concluded that the randomization succeeded.

Table 9

t-test results comparing age, gender and education on processing fluency and product choice (N=128)

	Mean	SD	T	df	p
Total product choice					
- age	4.03	1.223	.733	126	.465
- education	3.98	1.759	1.866	126	.064
- gender	1.42	.496	-1.366	126	.174
Processing fluency					
- age	4.03	1.223	-1.923	126	.057
- education	3.98	1.759	-1.489	126	.626
- gender	1.42	.496	-1.060	126	.291

3.9 Research integrity

Some ethical considerations and mitigating actions were performed in this research to overcome ethical issues. To start with, data were kept anonymous and participants were assured that gathered data would not be provided to third parties under any circumstances. Also, the opening statement announced that gathered information will be handled confidential. The participants were able to withdraw their participation at any time during the experiment.

Furthermore, participants were informed that participation in this research did not entail any risks or inconveniences and they are not confronted with offensive material. Participants were allowed to withdrawal from the research at any time they wanted and could only start with the research after reading and agreeing with the opening statement. Lastly, the participants were assured that data would only be used for this master thesis and reporting was done with particular attention to adhere to rules, regulations and guidelines.

4. Results

This chapter presents the testing of the hypothesis and results of the applied analysis in order to answer the main research question *‘What are the effects of positioning a sustainable product left versus right, or top versus down of an unsustainable product by using default product options and which positioning will result in a preference of the sustainable product choice?’* First, the assumptions of logistic regression will be tested, thereafter the results of the hypothesis will be presented. During the analysis a hierarchical regression was performed to show whether conditions and control variables explain a statistically significant amount of variance in the dependent variables ‘product choice, choicestraw, choicebottle and choicecoffee’.

4.1 Assumptions

Before the hypothesis could be tested by means of logistic regression, four assumptions had to be met. Firstly, the independent variables ‘condition’ as well as the mediators ‘PFtotal, PFbottle, PFstraw, PFcoffee’ had to be on an interval or nominal level which is the case, so the first assumption was met. Second, the dependent variable should be dichotomous and coded accordingly, which is also the case. The desired outcome of this study is sustainable product choice, so the sustainable choice was coded 0, and the unsustainable choice was coded 1. Third, observations have to be independent, this assumption is met because observations do not come from a repeated measure or matched data. Fourth, the independent variables ‘condition’ and the mediators ‘PFtotal, PFstraws, PFcoffee, PFbottle’ had to be linearly related to the log odds of the dependent variables ‘product choice, choicestraw, choicecoffee, choicebottle’. To check the last assumption new log variables were created for the mediators ‘PFtotal, PFstraws, PFcoffee, PFbottle’ into ‘PFtotallog, PFcoffeelog, PFstrawslog, PFbottlelog’ and interaction terms were created between these variables. After performing a binary logistic regression, it

was concluded that the fourth assumption was met. The mediators on interval level had a linear relationship with the log of the dependent variables ‘total product choice, choicestraw, choicecoffee and choicebottle’. See Appendix D for the output of the assumptions.

4.2 First hypothesis horizontal display

The results of the first hypothesis ‘*placing a sustainable product left (versus right) of an unsustainable product, will result in higher processing fluency, increasing preference of the sustainable product choice*’ are presented in this paragraph. This hypothesis was partially supported, and a significant relationship was found between placing a sustainable product left (versus right) of an unsustainable product and the preference of the sustainable product choice. However, the path of the mediator processing fluency is insignificant and does not increase the likelihood of choosing a sustainable product.

Before the hypothesis was tested, it was analyzed whether there was a significant relationship between the horizontal condition and processing fluency. The results of the analysis of variance show that participants in the horizontal condition did not experience processing fluency. See table 10 for statistical results concerning the horizontal condition and processing fluency.

Table 10

Analysis of Variance between horizontal condition and processing fluency

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Condition-H and total processing fluency					
- Between groups	.113	1	.113	.271	.604
- within groups	26.288	63	.417		
- Total	26.401	64			
Condition-H and processing fluency straws					
- Between groups	.124	1	.124	.113	.738
- Within groups	68,992	63	1.095		
- Total	69.116	64			
Condition-H and processing fluency coffee					
- Between groups	.063	1	.063	.060	.807
- Within groups	65.42	63	1.042		
- Total	65.705	64			
Condition-H and processing fluency bottle					
- Between groups	1.234	1	1.34	1.416	.239
- Within groups	54.886	63	.871		
- Total	56.120	64			

Furthermore, it was checked if there was a significant relationship between processing fluency and product choice. A binary logistic regression was performed, and again no significant relationships were found. See table 11 for results of the binary logistic regression analysis on processing fluency and product choice. These findings rule out processing fluency as mediator, from here it can be concluded that no mediation occurred because no significant relationships were found.

Table 11

Results from Logistic Regression regarding processing fluency and product choice

Predictor	β	$SE \beta$	Wald's χ^2	df	p	e^{β} (odds ratio)	Nagelkerke R^2	Overall model evaluation
Product choice total								
- PFtotal	-5.13	.300	2.927	1	.087	.599	.032	$\chi^2(1) = 3.014$, $p = .083$
Product choice straws								
- PFstraws	-.019	.189	.010	1	.922	.982	.000	$\chi^2(1) = 0.10$, $p = .922$
Product choice coffee								
- PFcoffee	-.341	.184	3.437	1	.064	.711	.037	$\chi^2(1) = 3.566$, $p = .059$
Product choice bottle								
- PFbottle	-.051	.193	.070	1	.791	.950	.001	$\chi^2(1) = 0.070$, $p = .792$

Considering the control variables, a binary logistic regression was performed with 'total product choice' and control variables 'care sustainable products, care environment, total perceived environment, total perceived cost and medium'. No significant relationships were found and therefore it can be concluded that the control variables are not associated with the likelihood of choosing a sustainable product. These control variables were not included in the rest of the analysis because they were insignificant.

For the main analysis, a binary logistic regression was performed to ascertain effects of the horizontal condition and processing fluency, on the likelihood that participants make a choice for the sustainable products in general. The logistic regression model was statistically significant, $\chi^2(1) = 12.457$, $p = .002$. The model explained 23.7% (Nagelkerke R^2) of the variance in product choice and correctly classified 76.4% of cases. Participants in condition 1 were 1.577 times more likely to choose a sustainable product than those in condition 2. This demonstrates higher preference for the sustainable option when it is displayed to the left (versus right) of the unsustainable option. However, processing fluency does not influence the likelihood of participants choosing sustainable products. Therefore, it can be concluded that

the first hypothesis is partially confirmed. Table 12 presents results of the logistic regression of the first hypothesis.

Table 12

Results Logistic Regression Analysis Hypotheses 1 horizontal display

Predictor		β	$SE \beta$	Wald's χ^2	df	p	e^{β} (odds ratio)	Nagelkerke R^2	Overall model evaluation
Product choice total									
-	Condition 1	-1.577	.574	7.548	1	.006	.207	.237	$\chi^2(1) = 12.457$,
-	PFtotal	-.841	.445	3.575	1	.059	.431	.237	$p = .002$
Product choice straws									
-	Condition 1	-.319	.527	.367	1	.545	.727	.008	$\chi^2(2) = .397$,
-	PFstraws	.038	.265	.021	1	.885	1.039	.008	$p = .820$
Product choice coffee									
-	Condition 1	-1.781	.551	10.431	1	.001	.169	.232	$\chi^2(2) = 12.421$,
-	PFcoffee	-.257	.278	.854	1	.355	.774	.232	$p = .002$
Product choice bottle									
-	Condition 1	-.913	.538	2.878	1	.090	.401	.064	$\chi^2(2) = 3.121$,
-	PFbottle	.188	.293	.410	1	.522	1.206	.064	$p = .210$

Note. 0 = sustainable choice; 1 = unsustainable choice, condition 2 is reference category

In relation to the individual product choices, no significant relationships were found for horizontal exposure and product choice regarding straws. The logistic regression model for straws was not significant, $\chi^2(3) = .397$, $p = .820$. This means that placing a sustainable straw left (versus right) of an unsustainable straw does not lead to the preference of the sustainable choice. Also, for the product category water bottles no significant results were found and the logistic model was not significant $\chi^2(3) = 3.121$, $p = .210$. However, the logistic regression for the product category coffee, was statistically significant, $\chi^2(3) = 12.421$, $p = .002$. Participants in condition 1 were 1.178 times more likely to choose sustainable coffee than participants in condition 2. This means that placing sustainable coffee left (versus right) of unsustainable coffee products will result in the preference of the sustainable coffee choice. Perhaps this means that the type of product can have an influence on the eventual sustainable or unsustainable

choice of participants. See table 12 for results of the logistic regression on individual product choices.

4.2. Second hypothesis vertical display

The results of the second hypothesis *'placing a sustainable product on top (versus down) of an unsustainable product, will result in higher processing fluency, increasing preference of the sustainable product choice'* is presented in this part of the paragraph. This hypothesis is partially confirmed, and a significant relationship was found between placing a sustainable product top (versus down) of an unsustainable product and the preference of the sustainable product choice. However, this was not related to the mediator processing fluency. By means of an One – Way ANOVA, it was analyzed whether there was a significant relationship between the vertical condition and processing fluency experienced among respondents. No significant relationships were found for the vertical condition and the mediator. See table 13 for results regarding the vertical condition and processing fluency and table 11 for results of the logistic regression of processing fluency and product choice. It can be stated that no mediation occurred because no significant relationships were found between total processing fluency and the vertical condition, as well as total processing fluency and product choice in general.

Table 13

Analysis of Variance between vertical condition and processing fluency

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Condition-V and total processing fluency					
- Between groups	.141	1	.131	.329	.568
- Within groups	26.096	61	.428		
- Total	26.237	62			
Condition-V and processing fluency straws					
- Between groups	1.143	1	1.143	1.230	.272
- Within groups	56.674	61	.929		
- Total	57.816	62			
Condition-V and processing fluency coffee					
- Between groups	1.736	1	1.736	1.779	.187
- Within groups	59.536	61	.976		
- Total	61.272	62			
Condition-V and processing fluency bottle					
- Between groups	.769	1	.769	.671	.416
- Within groups	69.905	61	1.146		
- Total	70.674	62			

For the main analysis, a logistic regression was performed to ascertain effects of the vertical condition and processing fluency, on the likelihood that participants make a choice for the sustainable product in general. The logistic regression model was statistically significant, $\chi^2(2) = 9.457, p = .009$. The model explained 20% (Nagelkerke R^2) of the variance in product choice and correctly classified 71.4% of cases. Participants in condition 3 were 1.917 times more likely to choose a sustainable product than those in condition 4. This means that placing a sustainable product top (versus down) of an unsustainable product, will result in the preference of the sustainable product choice. However, processing fluency does not influence the likelihood of respondents choosing the sustainable product. Therefore, it can be concluded that the second hypothesis is partially confirmed. See table 14 for results of the logistic regression analysis considering the vertical display.

Table 14

Results Logistic Regression Analysis Hypotheses 2 vertical display

Predictor	β	<i>SE</i> β	Wald's χ^2	<i>df</i>	<i>p</i>	e^{β} (odds ratio)	Nagelkerke R^2	Overall model evaluation
Product choice total								
- Condition 3	-1.917	.702	7.459	1	.006	147	.200	$\chi^2(1) = 9.457$,
- PFtotal	-.075	.453	.027	1	.869	.928	.200	$p = .009$
Product choice straws								
- Condition 3	-1.399	.614	5.201	1	.023	.247	.125	$\chi^2(2) = 5.892$,
- PFstraws	-.215	.313	.472	1	.492	.492	.008	$p = .053$
Product choice coffee								
- Condition 3	-.874	.531	2.707	1	.100	.417	.117	$\chi^2(2) = 5.809$,
- PFcoffee	-.411	.284	2.090	1	.148	.663	.117	$p = .055$
Product choice bottle								
- Condition 3	-1.963	.819	5.748	1	.017	.140	.191	$\chi^2(2) = 8.407$,
- PFbottle	-.175	.288	.369	1	.543	.840	.191	$p = .015$

Note. 0 = sustainable choice; 1 = unsustainable choice, condition 3 is reference category

In relation to the individual product choices, a significant relationship was found for the vertical display and product choice regarding straws. The logistic regression model for straws was significant, $\chi^2(3) = 5.892$, $p = .053$. The model explained 23% (Nagelkerke R^2) of the variance in choice of straws and correctly classified 71.4% of cases. The results show that displaying sustainable straws to the left (versus right) of unsustainable straws creates a preference for the sustainable option. Participants in condition 3 were 1.399 times more likely to choose the sustainable option than those in condition 4, $B = -1.399$, Wald's $\chi^2(1) = 5.201$, $p = .023$. Furthermore, the logistic regression model for water bottles was statistically significant, $\chi^2(3) = 8.407$, $p = .015$. The model explained 19.1% (Nagelkerke R^2) of the variance in choice of water bottles and correctly classified 77.8% of cases. Participants in condition 3 were 1.963 times more likely to choose sustainable straws than those in condition 4, $B = -1.963$, Wald's $\chi^2(1) = 5.748$, $p = .017$. Lastly, the logistic regression model for coffee was not statistically significant, $\chi^2(3) = 5.809$, $p = .055$. The model explained 11.7% (Nagelkerke R^2) of the variance in choice of coffee and correctly classified 71.4% of cases. Moreover, from the analysis of the individual's product choices, it can be concluded that it depends on the type of product whether

participants make a sustainable or unsustainable product choice. See table 14 for results of the logistic regression on individual product choices.

4.3 Third hypothesis horizontal display stronger

The results of the third hypothesis *'placing a sustainable product left (versus right) of an unsustainable product, will result in higher processing fluency and in turn have a stronger effect on the preference of the sustainable product, than placing a sustainable product top (versus down) of the unsustainable product'* are presented in this paragraph. The logistic regression model was not significant, $\chi^2(3) = 1.488, p = .685$. The model explained only 4% (Nagelkerke R^2) of the variance in product choice and correctly classified 83.9% of cases. It can be concluded that the condition presenting the sustainable products left did not have a significant stronger effect than the condition presenting the sustainable products at the top. Regarding the individual product choices and the display of sustainable products, no significant relationships were found in relation to the horizontal display being stronger than the vertical display. This means that presenting a sustainable product left does not increase the choice of participants choosing a sustainable product compared to presenting a sustainable product at the top (in the product categories coffee, straws and water bottles).

To summarize, results of the current study significantly support the first and the second hypothesis partially. Namely, placing sustainable products left (versus right) of unsustainable products, will increase the preference of a sustainable product choice. Additionally, placing sustainable products at the top (versus down) of unsustainable products, will also increase the preference of a sustainable product choice. However, processing fluency did not occur for both hypotheses and therefore did not make the choice for the sustainable option more likely.

5. Conclusion and Discussion

Based on the results emerged from the current research, this chapter will provide a main conclusion to the central research question and hypotheses. Further, an elaboration of results will be given, and implications of the research will be discussed. Finally, recommendations are made for further research.

5.1 Conclusion

This study gained insights in how to put together choice architectures that nudge sustainable choices resulting in consumers making more sustainable product choices. The overall aim of

this study was to find out whether displaying default product options differing in terms of sustainability and placed in a horizontal or vertical way, result in a preference of the sustainable product. The main research question was: *‘What are the effects of positioning a sustainable product left versus right or top versus down of an unsustainable product by using default product options and which positioning will result in a preference of the sustainable product?’* As expected, positioning a sustainable product left (versus) right and top (versus) down of an unsustainable product will result in a preference of the sustainable product among consumers. In practice, this means that consumers are more likely to choose a sustainable product when it is presented left (versus right) of an unsustainable product, and when it is presented top (versus down) of an unsustainable product. However, this is not enhanced by the expected mediation with regards to processing fluency. This current research failed to find evidence for the relationship between processing fluency and sustainable product choices. Furthermore, there were no relationships found between visually displaying sustainable and unsustainable products horizontally, as displaying sustainable and unsustainable products vertically, and the experience of processing fluency among consumers. It was expected that in this research, the horizontal display of products would have a stronger effect than the vertical display on the choice of consumers. Despite, no evidence was found, and it can be concluded that visually displaying sustainable products left (versus right) of unsustainable products will not have a stronger effect on the choice of consumers than visually displaying sustainable products top (versus down) of unsustainable products.

In relation to the individual product choices, evidence was found that sustainable coffee was preferred when presented left (versus right) of unsustainable coffee products. Subsequently, sustainable straws and water bottles were preferred when they were presented top (versus bottom) of the unsustainable product choices. From this it can be concluded that it can depend on the type of product whether horizontal or vertical positioning will influence the product choice of consumers.

5.2 Discussion

This chapter will elaborate the results found in this present research. The first hypothesis stated, ‘placing a sustainable product left (versus right) of an unsustainable product, will result in higher processing fluency, increasing the preference of the sustainable product’. Like mentioned, this hypothesis is partially accepted as placing a sustainable product left (versus right) of an unsustainable product will lead to preference of the sustainable product. This is in

line with previous research demonstrating that horizontal product display can influence product choice (Chae & Hoegg, 2013; Chandon et al., 2009; Deng et al., 2016; Romero & Biswas, 2016). In particular, previous research found that presenting lighter and healthier options left (versus right) of unhealthy and heavier options, led to a preference of the lighter and healthier option (Black & Cherrier, 2010; Romero & Biswas, 2016). This current research confirmed this and found that sustainable products can also be seen as 'lighter' in comparison to unsustainable products. By means of the theory of spatial magnitude it can be explained why consumers tend to choose the sustainable products when it is presented on the left (versus right) of unsustainable products (Johnson-Ulrich & Vonk, 2018; Romero & Biswas, 2016). However, in contrast to previous studies, this is not due to the experienced processing fluency by consumers (Chae & Hoegg, 2013; Reber, Schwarz, & Winkielman, 2004). It can be possible that the images were displayed congruently with consumers' mental representation, resulting in a more favorable product evaluation and in turn influencing the product choice of consumers (Chae & Hoegg, 2013). However, processing fluency did not make the sustainable product choice more likely. In this research low processing fluency occurred, meaning that the products were processed with difficulty and more effort (Reber et al., 2004). Perhaps this was due to the fact that six products were too difficult to process for the participants. Also, it can be possible that the participants did not experience successful recognition toward the products, or they did not have suitable knowledge structures available to interpret the products (Reber et al., 2004).

Further, according to previous research, displays that are congruent with consumers' mental representation can result in a favorable product evaluation leading to easy processing (Chae & Hoegg, 2013; Chandon et al., 2009; Deng et al., 2016; Romero & Biswas, 2016). This current research did not examine if consumers favored the sustainable products after exposure. This means that no statements can be made about participants evaluating the products more positively after experiencing congruency. This research can only confirm statements about participants preference namely, that participants preferred a product when it is congruent to their mental representation.

The second hypotheses stated whether placing sustainable products at the top (versus down) of unsustainable products will lead to a preference of the sustainable product choice. This hypothesis was partially confirmed supporting consumers have a preference for sustainable products when it is presented at the top (versus down) of unsustainable products. This corresponds to previous research in the domain of vertical display of products, stating that vertically displaying stimuli can influence consumers choice (Chae & Hoegg, 2013; Chandon et al., 2009; Deng et al., 2016; Valenzuela and Raghuram, 2008). Eye-movement studies suggest

that not all product display locations attract equal attention. As a consequence this can create inferences (Chandon et al., 2009). Previous research stated that more positive product evaluations were found on the top shelf and negative product evaluations on the lower shelf, in turn influencing the choice of the consumers (Drèze, Hoch and Purk 1994 ; Valenzuela & Raghurir, 2008; Kerkchove et al., 2015). This current research did not test product quality inferences from consumers about products being positioned at the top or bottom. This means that no conclusions can be made about the fact that consumers prefer the sustainable product when it is positioned above an unsustainable product due to their product quality inferences. Further, the theory of spatial representation of magnitude says that products positioned at the top are 'light' and products at the bottom are 'heavy' (Deng et al., 2016). It can be confirmed that sustainable products are perceived as lighter and unsustainable as heavier due to the fact that consumers prefer the sustainable product when positioned top (versus down) of an unsustainable product. Further, it is important to mention that processing fluency did not make sustainable product choices more likely. This contrasts previous research in the domain of visual marketing and the display of products (Chae & Hoegg, 2013; Chandon et al., 2009; Deng et al., 2016; Romero & Biswas, 2016). The duration of exposure to the product display could have been too short for the participants to consciously experience processing fluency, and therefore processing fluency did not occur. It could also depend on the objective features of the products, like for instance their figure-ground contrast regarding color, clarity or symmetry of the products. Perhaps participants did not experience aesthetic pleasure while being exposed to the product display resulting in low processing fluency (Reber et al., 2004). It can also be possible that processing fluency did not occur because participants did not recognize the products, while processing fluency is associated with recognition (Reber et al., 2004). Furthermore, during the experiment, participants sat in front of their computer or looked on their mobile phone screen, the amount of processing fluency may be influenced by the height of the computer monitor or the size of the screen of the applied medium. Anyway, it can be concluded that in this current research participants found the products difficult to understand and process, resulting in more cognitive effort and in turn low processing fluency.

The third hypothesis was rejected and stated that placing a sustainable product left (versus) right of an unsustainable product, would have a stronger effect than placing a sustainable product top (versus down) of the unsustainable product. Previous research stated that horizontal displays are easier to process than vertical displays due to horizontal eye movements resulting in higher processing fluency (Deng et al., 2016). This current research shows the contrary and does not find an effect regarding horizontal display effects being

stronger. Furthermore, horizontal display cannot result in a higher processing fluency than vertical display since processing fluency did not occur in this research. In addition, previous research stated that screen-based products facilitate the visual processing of horizontal information due to their shape, making horizontal eye movement easier and resulting in higher processing fluency (Deng et al., 2016). This research was performed in a screen-based context by using laptops, computers and mobile phones. However, it has not been tested if horizontal eye movement was actually easier to process than vertical. This means that it cannot be confirmed that horizontal display facilitates the perceptual span and therefore is more fluent than vertical display (Deng et al., 2016; Rayner, Slattery, & Bélanger, 2010). Moreover, it was said that vertical eye movements are more effortful than horizontal eye movements (Van Kerckhove et al., 2015). As result of this research being performed in an on-screen context, respondents did not have to tilt their head up and down as much as when this research was performed in an in-store context (Chandon et al. 2007; Chae & Hoegg, 2013; Deng et al. 2016). Therefore, it can be possible that horizontal display did not have a stronger effect than the vertical display.

5.2.1. Theoretical Implications

The findings of this study have important theoretical implications. To start with, this study contributes to the domain of visual marketing research by highlighting how subtle cues, like horizontal and vertical positioning of products influence consumers product choice. Prior research has examined different aspects of horizontal and vertical product display in different research contexts regarding consumer food and in-store product choices (Chandon et al. 2007; Chae & Hoegg, 2013; Deng et al. 2016). This research provides evidence for horizontal and vertical product display regarding consumers product choices with sustainable and unsustainable products. Beside this research is conducted in a screen-based context, adding empirical relevance for research concerning screen-based shopping situations.

Furthermore, this study is one of the first to examine the effects of vertical and horizontal placement in relation to sustainable and unsustainable products. Presenting that horizontally displaying sustainable options left (versus right) of unsustainable options is congruent with consumers mental representation. Further, displaying sustainable options top (versus down) of unsustainable options is also congruent with consumers' mental representation. Therefore, the findings add body to the literature considering the theory of spatial representation of magnitude and products being congruent or not according to

consumers' mental representation. This research provides evidence for sustainable products being perceived as 'light' and unsustainable products as 'heavy'. Additionally, these findings rule out left-right bias and primacy effects. If left-right bias and primacy effects would have occurred, unsustainable products presented left would have been preferred as well. However, this research provides evidence that left-right bias and primacy effects do not always occur and can be interesting for future research to build their theoretical framework on.

Furthermore, comparing findings with existing academic literature, the findings of this study do not acknowledge the existence of processing fluency. It can be possible that the difference with the findings of this study and the findings of previous studies is caused by different research methods. Hence, it is important to reflect about possible explanations why processing fluency did not occur because it could contribute to the theoretical insights. Like mentioned, perhaps the exposure was too short, or participants did not consciously experience processing fluency, did not recognize the products, or six products were too hard to process. This has been addressed in the previous paragraph and will be further addressed in the limitations paragraph.

5.2.2 Practical implications

This research has interesting practical implications for field- or lab-based research studies involving consumer choice and sustainable products. Furthermore, this research has compelling implications for retail products display, online shopping display as well as menu designs and configurators. Assortment design can contain nudges that will help consumers make certain desirable choices. For instance, if a store wants to enhance sales of sustainable products, they can display sustainable products left (versus right) of the unsustainable products. Also, a store can display their sustainable products at the top and unsustainable products at the bottom. Furthermore, stores could present their perceived 'lighter' products at the top or left of their display and their perceived 'heavier' products at the right and the bottom to enhance sales by customers. Therefore, it is advisable that product retailers consider the perceived weight of products so the positions can incite consumers to select the preferred brands or products. For instance, when retailers want to promote the sales of healthy food, the products should be presented to the left (versus right) or above (versus down) of the unhealthy food products.

The findings of this current research are also relevant for the online shopping context, where consumers are exposed to displays through a screen and cannot touch, wear or interact with the products. Therefore, creating good product images that are located on the best possible

positions on screen are important for eventual product choices of consumers. Like mentioned, technology can be used to influence a choice task by how choice is presented. Mobile and computer interfaces could for instance present nudges that will help consumers make certain desirable choices. In practice this means that default settings should display the sustainable products left (versus right) or at the top (versus down) of the unsustainable products. This will nudge consumers to prefer the sustainable product. Online configurators could also contain nudges. For instance, when a consumer is putting together a product through online configurators, presenting the default product settings in accordance to their mental representation, this could lead to congruency and in turn influence their product preference. Additionally, if online stores want to encourage sustainable delivery or sustainable packaging of products, they could present the eco-friendly sustainable options on the left or the top of the online display versus the unsustainable options on the opposite side.

Given the worldwide concerns about the environment, factors that influence choice regarding sustainable products are important. Furthermore, it is relevant for policymakers to understand how visual cues can influence choice. For instance, policymakers could use the findings of this research to nudge consumers into making more sustainable product choices that are better for the environment. Policy makers could steer consumers into choosing green energy by always presenting green energy left (versus right) or at the top (versus down) of an unsustainable source of energy.

5.3 Limitations and future research

Even though this research provides interesting insights and implications, there are also limitations that should be addressed. Firstly, the sample size consisted of 128 participants, more participants would have increased the power of the data and therefore the power of the control variables. For instance, the Cronbach's alpha of the established scale measuring 'total perceived cost' is .471 which is very low and shows a low internal consistency. This makes the scale not strong, perhaps with more participants the data and therefore the scales could have been stronger. The average age was 25 which is quite young, this can bias results and make this research less generalizable to the whole population. Participants were recruited through convenience sampling what also creates biased results and sampling error.

Further, the main research only tested three product categories considering sustainable and unsustainable product choices. Perhaps the researcher could have tested more product categories and looked at products that have different quality, esthetic and price inferences. This

was ignored in this current research, yet these factors are important for the eventual product choice of consumers. Additionally, the results show that it can depend on the type of product whether horizontal or vertical positioning will influence the product choice of consumers. This can be interesting for future research, to find out whether certain products can be better positioned horizontally or vertically so consumers will make the desired choices.

Also, participants were able to conduct the research at home or on their mobile phone at any preferred location. This can result in participants going through the experiment with less attention and care, what in turn can influence results. Furthermore, the vertical and horizontal displays were made to fit the displays of the computer, so participants did not have to scroll left, right or up or down to view all the products. However, the participants did have to scroll to view the product display on their mobile phone. This perhaps could have influenced experienced processing fluency and therefore the results. Although, this research did control for the medium that participants used to fill in the questionnaire, no significant results were found with regards to this medium influencing product choice.

Another important limitation of this study was the fact that displaying six products horizontally or vertically was not efficient enough for participants to experience processing fluency. As a result, processing fluency did not occur. Like mentioned, perhaps participants did not consciously experience processing fluency because perhaps the duration of the exposure was too short, or six products were too difficult to process. According to the pretest concerning processing fluency participants experienced the processing fluency of six products as neutral, or neither easy nor uneasy. The researcher should have elaborated this in a more sufficient manner and perhaps should have used fewer products to make high processing fluency occur. According to the pretest participants experienced higher processing fluency when exposed to two products. Future research could take this into consideration and perhaps look into how many products should be displayed for high processing fluency to occur.

Furthermore, future research could focus on relevant moderators, like the moderators tested in this current research. For instance, a person's orientation and cost evaluation towards sustainable products, or his attitude towards the environment and sustainable products in general. Controlling the level of enjoyment participants experience while online shopping can also be valuable. Future research could also focus on motivations why consumers choose a sustainable or unsustainable product or look into different consumer types. Furthermore, a person's cultural background could also be a relevant moderator since this research was conducted with mostly Dutch citizens. Therefore, it was expected that they process information from left to right. Perhaps citizens from other countries who read from right to left will have

different outcomes. Further, this research looked into the dependent variable consumers choice, however it could be interesting for future research to look into the effects of horizontal and vertical displays on other dependent variables like evaluation, satisfaction or aesthetics.

Additionally, this research focused for most part on the effects of presenting sustainable and unsustainable products vertically and horizontally in relation to processing fluency. However, the underlying processes, like congruency was not examined. It would be interesting for future research to explore the underlying processes in greater depth. Also, when displaying items horizontally and vertically it would be interesting to look at the effects on consumer choice when products have different prices, luxury or gratifications levels. For instance, looking at what would happen if the sustainable (and perceived lighter) option would be positioned as less in terms of quality or performance.

This research demonstrated that displaying sustainable products left (versus right) and top (versus down) of unsustainable products, will lead to a preference of the sustainable products among consumers. It is important to take this knowledge to our advantage and recognize that choice can be designed to the context we need. This research provides evidence that it is possible to guide decision-making among consumers and let them produce choices we want them to make.

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Appendix A: Products displayed during experiment



Orange Plastic Straws



Plastic Rainbow Straws



Plastic Black Straws



RVS Reusable Straws



Eco Paper Straws



Bamboo Reusable Straws



Water Bottle made from PET Plastic



Supermarket Plastic Water Bottle



Regular Plastic Water Bottle



Reusable Bottle



Eco Plastic Reusable Bottle



Reusable Sustainably Sourced Bamboo Bottle



Pizza Bianca



Pizza Margherita



Pizza Hot Chicken



Pizza Salami



Pizza Hawaii



Pizza Mexican Hot & Spicy



Dark Roast
Espresso
Coffee Beans



Slow Roasted
Coffee Beans



Regular Coffee
Beans



Fair Trade Dark
Roast Espresso
Coffee Beans



Organic Slow
Roasted
Coffee Beans



Bio Organic
Regular
Coffee Beans



Black White
Polka dot
Cushion



Green Cushion



Multi Colored
Cushion



Gold Cushion



Green and
Gold Leaves
Cushion



Blue White
Print Cushion

Appendix B Pretest Processing Fluency

Thank you for participating with this questionnaire. It will only take a minute ;)

You will find different questions asking how difficult you find it to process the products. The data will be treated with great care. This research is anonymous, and data will be handled confidential. This data is used for a master thesis of the Radboud University and not for any other purposes.

All the best,

Astrid Hendrixx

What is your age?

What is your gender?

☐ Female

☐ Male

Take a look at the display with two different coffee products, afterwards we will ask a few questions.



How easy did you find it to visually process the display?

- ☐ Very easy
 - ☐ Easy
 - ☐ Neither Easy nor Uneasy
 - ☐ Uneasy
 - ☐ Not easy at all
-

How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a look at the display with six different coffee products, afterwards we will ask a few questions.



How easy did you find it to visually process the display?

- ☐ Very easy
 - ☐ Easy
 - ☐ Neither Easy nor Uneasy
 - ☐ Uneasy
 - ☐ Not easy at all
-

How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a look at the display with eight different coffee products, afterwards we will ask a few questions.



How easy did you find it to visually process the display?

- ☐ Very easy
 - ☐ Easy
 - ☐ Neither Easy nor Uneasy
 - ☐ Uneasy
 - ☐ Not easy at all
-

How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
- ☐ Difficult
- ☐ Neutral
- ☐ Not difficult
- ☐ Not difficult at all

Thank you for participating!

Pre-test sustainable or unsustainable product

Thank you for participating with this questionnaire. It will only take a minute ;) You will find different questions asking which product you find more sustainable. Please answer how sustainable you think the product is. The data will be treated with great care for the respondents. This research is anonymous, and data will be handled confidential. This data is used for a master thesis of the Radboud University and not for any other purposes.

What is your age?

What is your gender?

☐ Female

☐ Male

How sustainable do you find this product?



☐ Very sustainable

☐ Somewhat sustainable

☐ Neutral

☐ Not very sustainable

☐ Not sustainable at all

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



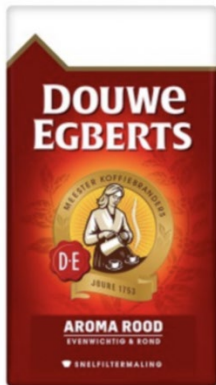
- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
- ☐ Somewhat sustainable
- ☐ Neutral
- ☐ Not very sustainable
- ☐ Not sustainable at all

How sustainable do you find this product?



- ☐ Very sustainable
- ☐ Somewhat sustainable
- ☐ Neutral
- ☐ Not very sustainable
- ☐ Not sustainable at all

How sustainable do you find this product?



- ☐ Very sustainable
- ☐ Somewhat sustainable
- ☐ Neutral
- ☐ Not very sustainable
- ☐ Not sustainable at all

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
 - ☐ Somewhat sustainable
 - ☐ Neutral
 - ☐ Not very sustainable
 - ☐ Not sustainable at all
-

How sustainable do you find this product?



- ☐ Very sustainable
- ☐ Somewhat sustainable
- ☐ Neutral
- ☐ Not very sustainable
- ☐ Not sustainable at all

Thank you for participating. Have a great day!:)

Appendix C Questionnaires used for the experiment

Condition 1 horizontal display: sustainable left versus unsustainable right

Dear respondent,

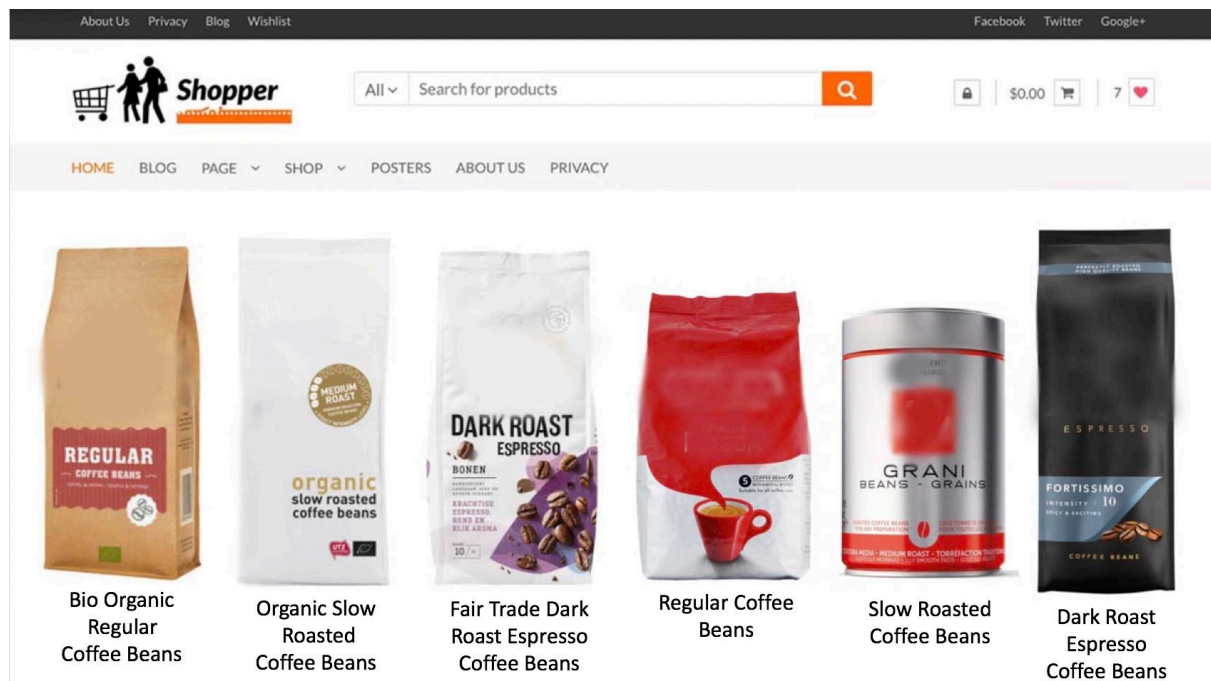
Thank you for participating in this research. For my studies at the Radboud University, I am conducting research about online shopping. The survey will last approximately 8-10 minutes. When completing the survey, it is important to remember that it is about your own personal opinion. This means that there are no right or wrong answers. Because this research is carried out under the responsibility of the Radboud University, you have guarantee that: You will be kept anonymous and your answers will not be provided to third parties under any circumstances. The results are not linked to your name and will be used only for this research. You can withdraw your participation at any time during the survey, you can also cancel your participation. Participation in this research does not entail any significant risks or inconveniences for you, there is no willful deception, and you are not confronted with offensive material. Your participation in this survey is completely voluntary. By continuing you indicate your agreement with participation. If you have any questions about the research please contact Astrid Hendriks and send an email to a.b.hendriks@hotmail.com or call 06-46008052. I hope I have informed you sufficiently and thank you in advance for your participation, this will enable me to graduate.

All the best, Astrid Hendriks

The survey will start now.

During this research you are confronted with several online shopping situations and asked to choose a product you would like to buy. It is important to view the assortment as if you are online shopping. Also, view the products as if all the prices across the different products are equivalent. After every display, you are asked to select one product that you would like to buy. You are asked to choose six products in total. After every product is chosen, you are asked a few questions.

Take a good look at the products and decide what product you would like to buy.



- ☐ Dark Roast Espresso Coffee Beans
- ☐ Slow Roasted Coffee Beans
- ☐ Regular Coffee Beans
- ☐ Fair Trade Dark Roast Espresso Coffee Beans
- ☐ Organic Slow Roasted Coffee Beans
- ☐ Bio Organic Regular Coffee Beans

How easy did you find it to visually process the display?

- ☐ Not easy at all
- ☐ Uneasy
- ☐ Neither Easy nor Uneasy
- ☐ Easy
- ☐ Very easy

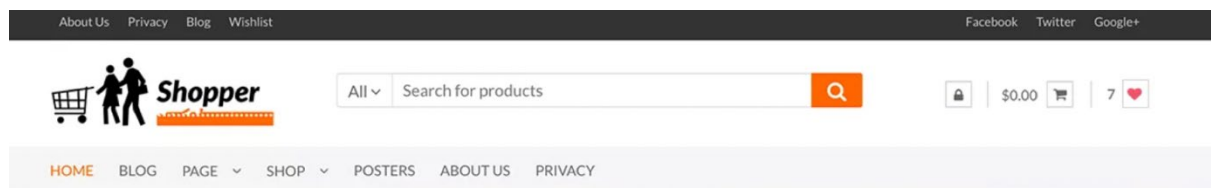
How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Pizza Bianca
 - ☐ Pizza Salami
 - ☐ Pizza Hawaii
 - ☐ Pizza Mexican Hot & Spicy
 - ☐ Pizza Hot Chicken
 - ☐ Pizza Margherita
-

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

How difficult is it for you to visualize this display with your eyes closed?


- ☐ Very difficult
- ☐ Difficult
- ☐ Neutral
- ☐ Not difficult
- ☐ Not difficult at all

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-


Take a good look at the products and decide what product you would like to buy.


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**Reusable
Sustainably
Sourced
Bamboo Bottle**


**Reusable
Bottle**


**Eco Plastic
Reusable
Bottle**


**Regular Plastic
Water Bottle**


**Supermarket
Plastic Water
Bottle**


**Water Bottle
made from PET
Plastic**

What product would you buy?

- ☐ Water Bottle made from PET Plastic
- ☐ Supermarket Plastic Water Bottle
- ☐ Regular Plastic Water Bottle
- ☐ Reusable Bottle
- ☐ Eco Plastic Reusable Bottle
- ☐ Reusable Sustainably Sourced Bamboo Bottle

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

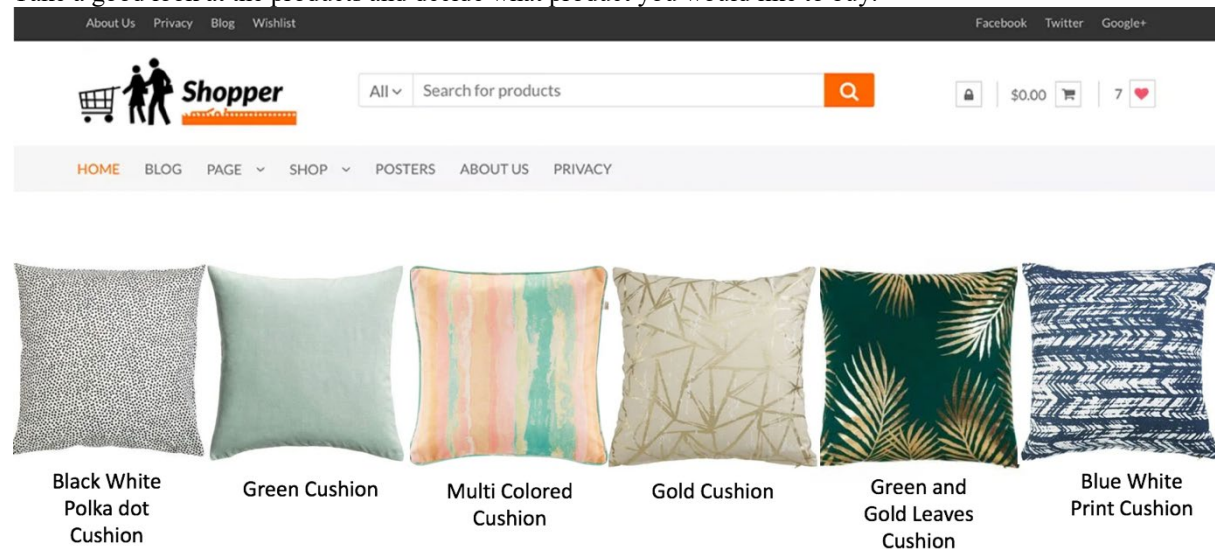
How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Green and Gold Leaves Cushion
- ☐ Multi Colored Cushion
- ☐ Black White Polka dot Cushion
- ☐ Blue White Print Cushion
- ☐ Gold Cushion
- ☐ Green Cushion

How easy did you find it to visually process the display?

- ☐ Not easy at all
- ☐ Uneasy
- ☐ Neither Easy nor Uneasy
- ☐ Easy
- ☐ Very easy

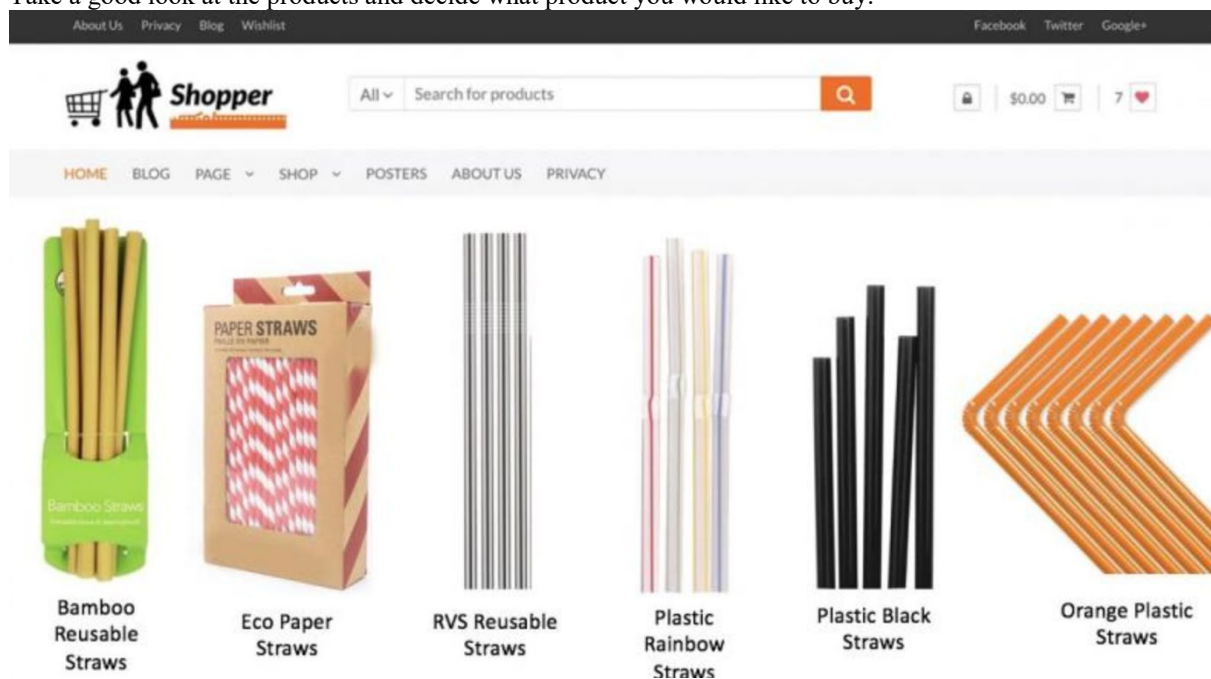
How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Orange Plastic Straws
 - ☐ Plastic Black Straws
 - ☐ Plastic Rainbow Straws
 - ☐ RVS Reusable Straws
 - ☐ Eco Paper Straws
 - ☐ Bamboo Reusable Straws
-

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

You are almost through the survey. The following questions are about green products. Green products are those that have less of an impact on the environment or are less detrimental to human health than traditional equivalents.

Green products are good for the environment.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products can effectively reduce pollution.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products cannot help slow the deterioration of the environment.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products are expensive.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-



Green products cost more than non-green products.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products are cheaper than non-green products.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly Agree
-

Please slide the slider to the preferred amount. The scale ranges from 0 (none at all) to 100 (a great deal).

	None at all	A little	A moderate amount	A lot	A great deal						
	0	10	20	30	40	50	60	70	80	90	100
How much do you care about sustainable products? ()											
How much do you care about the environment? ()											

What medium did you use to fill in the survey?

- ☐ Mobile phone
- ☐ Computer / Laptop
-

What is your gender?

- ☐ Female
- ☐ Male
-

What is your nationality?

- ☐ Dutch
- ☐ Other, namely _____
-

What is your highest degree or school level you have completed?

- ☐ Secondary education
- ☐ MBO
- ☐ HBO (Bachelor)
- ☐ HBO (Master)
- ☐ WO (Bachelor)
- ☐ WO (Master)
- ☐ Doctorate or PHD
-

What is your age?

- ☐ Under 12 years old
- ☐ 12 - 17 years old
- ☐ 18 - 24 years old
- ☐ 25 - 34 years old
- ☐ 35 - 44 years old
- ☐ 45 - 54 years old
- ☐ 55 - 64 years old
- ☐ 65 - 74 years old
- ☐ 75 years old or older
-

What do you think this research is about?

Condition 2 horizontal display: unsustainable left versus sustainable right

Dear respondent,

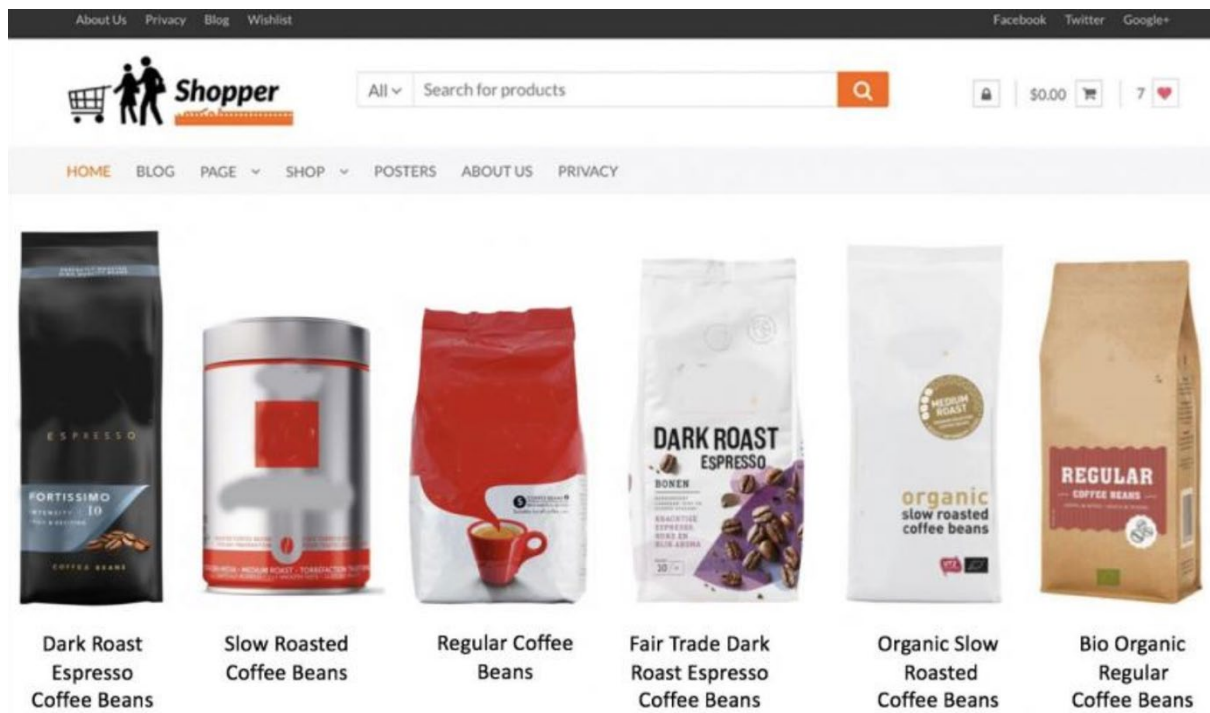
Thank you for participating in this research. For my studies at the Radboud University, I am conducting research about online shopping. The survey will last approximately 8-10 minutes. When completing the survey, it is important to remember that it is about your own personal opinion. This means that there are no right or wrong answers. Because this research is carried out under the responsibility of the Radboud University, you have guarantee that: You will be kept anonymous and your answers will not be provided to third parties under any circumstances. The results are not linked to your name and will be used only for this research. You can withdraw your participation at any time during the survey, you can also cancel your participation. Participation in this research does not entail any significant risks or inconveniences for you, there is no willful deception, and you are not confronted with offensive material. Your participation in this survey is completely voluntary. By continuing you indicate your agreement with participation. If you have any questions about the research please contact Astrid Hendriks and send an email to a.b.hendriks@hotmail.com or call 06-46008052. I hope I have informed you sufficiently and thank you in advance for your participation, this will enable me to graduate.

All the best, Astrid Hendriks

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Take a good look at the products and decide what product you would like to buy.



- ☐ Dark Roast Espresso Coffee Beans
- ☐ Slow Roasted Coffee Beans
- ☐ Regular Coffee Beans
- ☐ Fair Trade Dark Roast Espresso Coffee Beans
- ☐ Organic Slow Roasted Coffee Beans
- ☐ Bio Organic Regular Coffee Beans

How easy did you find it to visually process the display?

- ☐ Not easy at all
- ☐ Uneasy
- ☐ Neither Easy nor Uneasy
- ☐ Easy
- ☐ Very easy

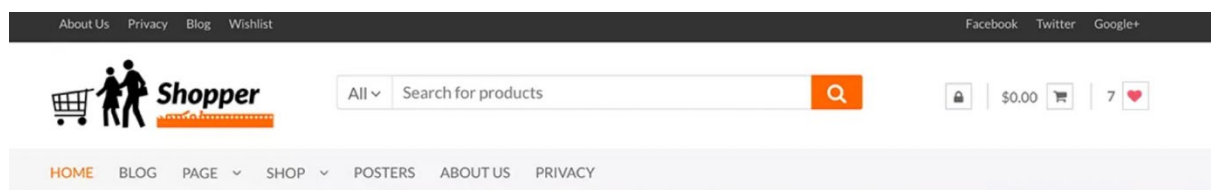
How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Pizza Bianca
 - ☐ Pizza Salami
 - ☐ Pizza Hawaii
 - ☐ Pizza Mexican Hot & Spicy
 - ☐ Pizza Hot Chicken
 - ☐ Pizza Margherita
-

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

How difficult is it for you to visualize this display with your eyes closed?


- ☐ Very difficult
- ☐ Difficult
- ☐ Neutral
- ☐ Not difficult
- ☐ Not difficult at all

How difficult would you find the task to describe this display at a later point in time?


- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.


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Water Bottle
made from PET
Plastic




Supermarket
Plastic Water
Bottle




Regular Plastic
Water Bottle



Reusable
Bottle



Eco Plastic
Reusable
Bottle



Reusable
Sustainably
Sourced
Bamboo Bottle

What product would you buy?

- ☐ Water Bottle made from PET Plastic
- ☐ Supermarket Plastic Water Bottle
- ☐ Regular Plastic Water Bottle
- ☐ Reusable Bottle
- ☐ Eco Plastic Reusable Bottle
- ☐ Reusable Sustainably Sourced Bamboo Bottle

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

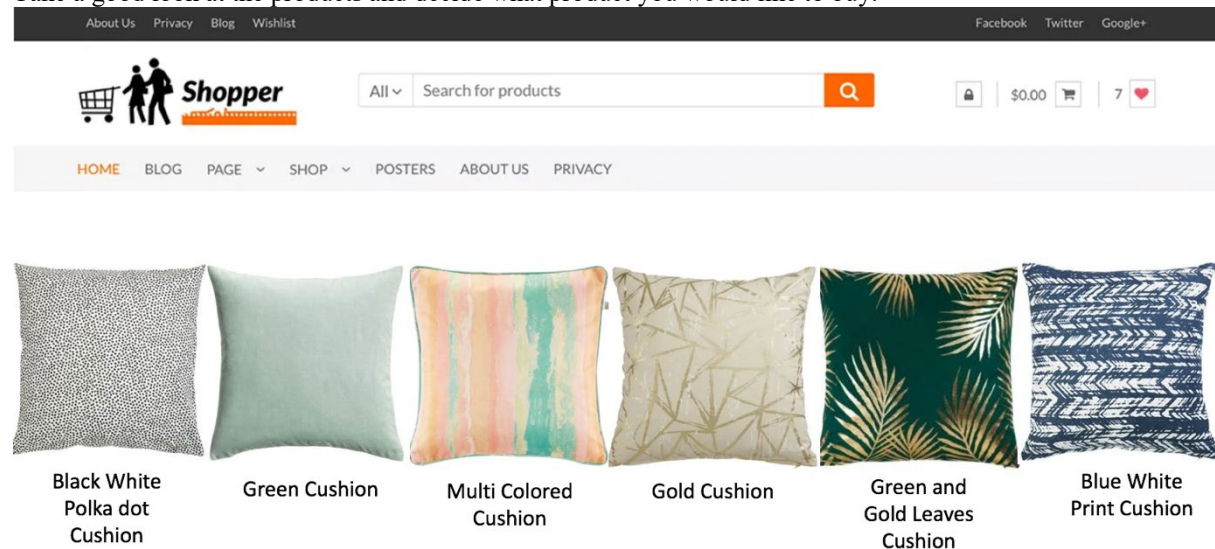
How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Green and Gold Leaves Cushion
- ☐ Multi Colored Cushion
- ☐ Black White Polka dot Cushion
- ☐ Blue White Print Cushion
- ☐ Gold Cushion
- ☐ Green Cushion

How easy did you find it to visually process the display?

- ☐ Not easy at all
- ☐ Uneasy
- ☐ Neither Easy nor Uneasy
- ☐ Easy
- ☐ Very easy

How difficult is it for you to visualize this display with your eyes closed?



- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-




How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-


Take a good look at the products and decide what product you would like to buy.

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Orange Plastic Straws




Plastic Rainbow Straws




Plastic Black Straws



RVS Reusable Straws



Eco Paper Straws



Bamboo Reusable Straws

What product would you buy?

- ☐ Orange Plastic Straws
 - ☐ Plastic Black Straws
 - ☐ Plastic Rainbow Straws
 - ☐ RVS Reusable Straws
 - ☐ Eco Paper Straws
 - ☐ Bamboo Reusable Straws
-

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

You are almost through the survey. The following questions are about green products. Green products are those that have less of an impact on the environment or are less detrimental to human health than traditional equivalents.

Green products are good for the environment.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products can effectively reduce pollution.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products cannot help slow the deterioration of the environment.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products are expensive.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-



Green products cost more than non-green products.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products are cheaper than non-green products.

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly Agree
-

Please slide the slider to the preferred amount. The scale ranges from 0 (none at all) to 100 (a great deal).

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How much do you care about sustainable products? ()											
How much do you care about the environment? ()											

What medium did you use to fill in the survey?

- ☐ Mobile phone
- ☐ Computer / Laptop
-

What is your gender?

- ☐ Female
- ☐ Male
-

What is your nationality?

- ☐ Dutch
- ☐ Other, namely _____
-

What is your highest degree or school level you have completed?

- ☐ Secondary education
- ☐ MBO
- ☐ HBO (Bachelor)
- ☐ HBO (Master)
- ☐ WO (Bachelor)
- ☐ WO (Master)
- ☐ Doctorate or PHD
-

What is your age?

- ☐ Under 12 years old
- ☐ 12 - 17 years old
- ☐ 18 - 24 years old
- ☐ 25 - 34 years old
- ☐ 35 - 44 years old
- ☐ 45 - 54 years old
- ☐ 55 - 64 years old
- ☐ 65 - 74 years old
- ☐ 75 years old or older
-

What do you think this research is about?

Condition 3 vertical display: sustainable top versus unsustainable down

Dear respondent,

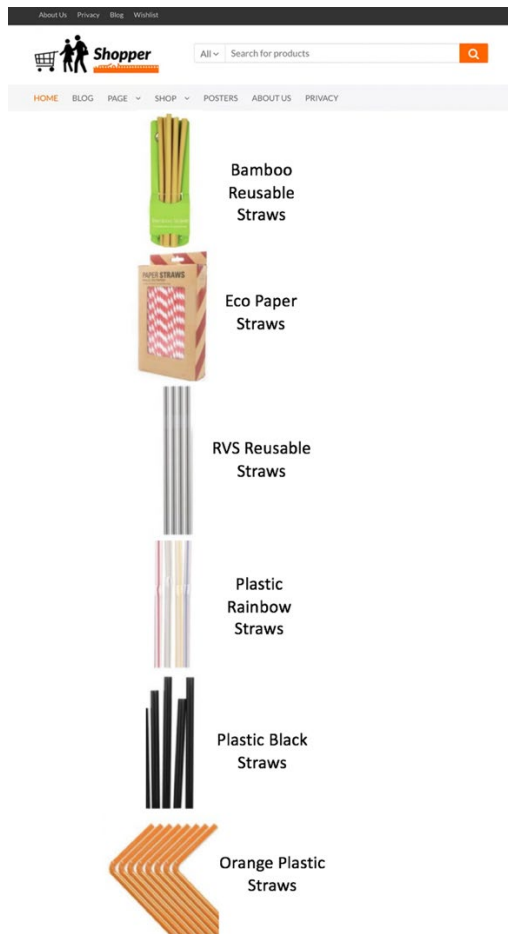
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All the best, Astrid Hendriks

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Take a good look at the products and decide what product you would like to buy.



- ☐ Dark Roast Espresso Coffee Beans
 - ☐ Slow Roasted Coffee Beans
 - ☐ Regular Coffee Beans
 - ☐ Fair Trade Dark Roast Espresso Coffee Beans
 - ☐ Organic Slow Roasted Coffee Beans
 - ☐ Bio Organic Regular Coffee Beans
-

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

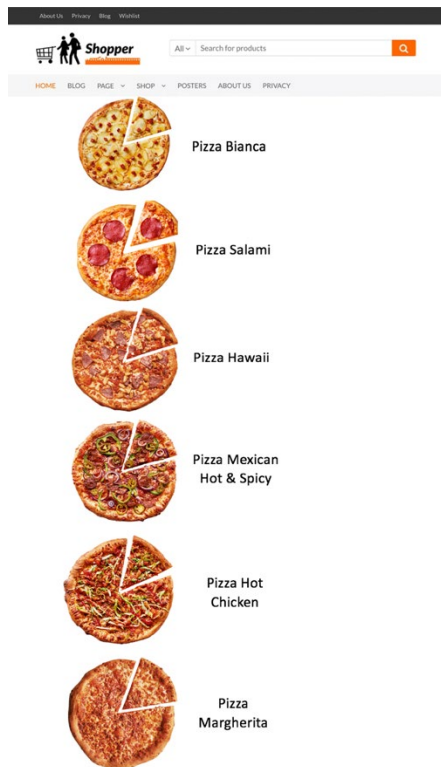
How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Pizza Bianca
- ☐ Pizza Salami
- ☐ Pizza Hawaii
- ☐ Pizza Mexican Hot & Spicy
- ☐ Pizza Hot Chicken
- ☐ Pizza Margherita

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

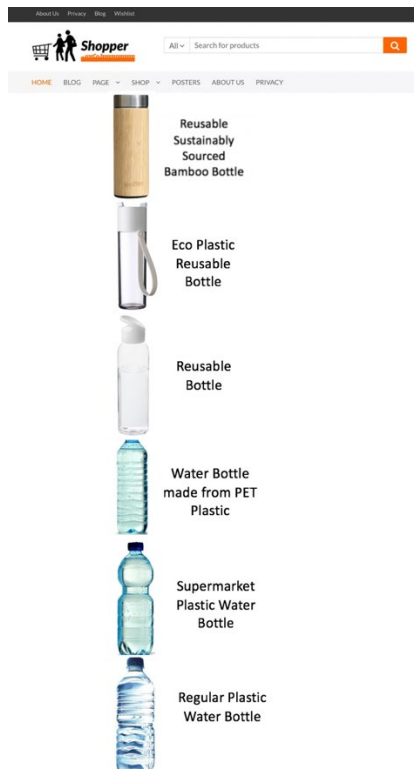
How difficult is it for you to visualize this display with your eyes closed?

- ☐ Very difficult
- ☐ Difficult
- ☐ Neutral
- ☐ Not difficult
- ☐ Not difficult at all

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Water Bottle made from PET Plastic
- ☐ Supermarket Plastic Water Bottle
- ☐ Regular Plastic Water Bottle
- ☐ Reusable Bottle
- ☐ Eco Plastic Reusable Bottle
- ☐ Reusable Sustainably Sourced Bamboo Bottle

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

How difficult is it for you to visualize this display with your eyes closed?

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How difficult would you find the task to describe this display at a later point in time?

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 - ☐ Difficult
 - ☐ Neutral
 - ☐ Not difficult
 - ☐ Not difficult at all
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Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Green and Gold Leaves Cushion
- ☐ Multi Colored Cushion
- ☐ Black White Polka dot Cushion
- ☐ Blue White Print Cushion
- ☐ Gold Cushion
- ☐ Green Cushion

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
 - ☐ Easy
 - ☐ Very easy
-

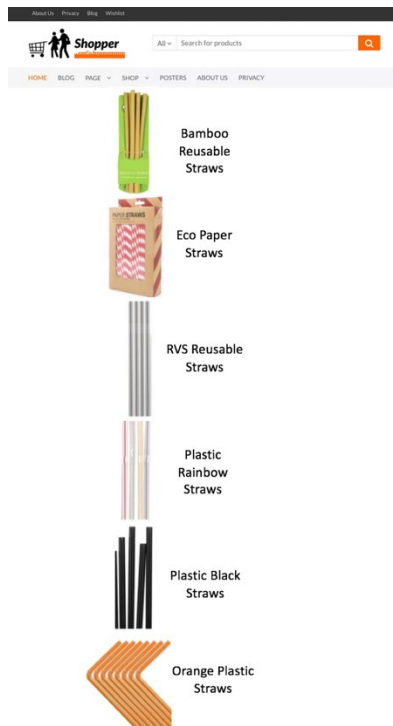
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 - ☐ Not difficult
 - ☐ Not difficult at all
-

How difficult would you find the task to describe this display at a later point in time?

- ☐ Very difficult
 - ☐ Difficult
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 - ☐ Not difficult
 - ☐ Not difficult at all
-

Take a good look at the products and decide what product you would like to buy.



What product would you buy?

- ☐ Orange Plastic Straws
- ☐ Plastic Black Straws
- ☐ Plastic Rainbow Straws
- ☐ RVS Reusable Straws
- ☐ Eco Paper Straws
- ☐ Bamboo Reusable Straws

How easy did you find it to visually process the display?

- ☐ Not easy at all
 - ☐ Uneasy
 - ☐ Neither Easy nor Uneasy
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How difficult is it for you to visualize this display with your eyes closed?

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- ☐ Very difficult
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 - ☐ Not difficult
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-

You are almost through the survey. The following questions are about green products. Green products are those that have less of an impact on the environment or are less detrimental to human health than traditional equivalents.

Green products are good for the environment.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products can effectively reduce pollution.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products cannot help slow the deterioration of the environment.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products are expensive.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-



Green products cost more than non-green products.

- ☐ Strongly Disagree
 - ☐ Disagree
 - ☐ Neither agree nor disagree
 - ☐ Agree
 - ☐ Strongly Agree
-

Green products are cheaper than non-green products.

- ☐ Strongly Disagree
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-

Please slide the slider to the preferred amount. The scale ranges from 0 (none at all) to 100 (a great deal).

	None at all	A little	A moderate amount	A lot	A great deal						
	0	10	20	30	40	50	60	70	80	90	100
How much do you care about sustainable products? ()											
How much do you care about the environment? ()											

What medium did you use to fill in the survey?

- ☐ Mobile phone
- ☐ Computer / Laptop

What is your gender?

- ☐ Female
- ☐ Male

What is your nationality?

- ☐ Dutch
- ☐ Other, namely _____

What is your highest degree or school level you have completed?

- ☐ Secondary education
 - ☐ MBO
 - ☐ HBO (Bachelor)
 - ☐ HBO (Master)
 - ☐ WO (Bachelor)
 - ☐ WO (Master)
 - ☐ Doctorate or PHD
-

What is your age?

- ☐ Under 12 years old
 - ☐ 12 - 17 years old
 - ☐ 18 - 24 years old
 - ☐ 25 - 34 years old
 - ☐ 35 - 44 years old
 - ☐ 45 - 54 years old
 - ☐ 55 - 64 years old
 - ☐ 65 - 74 years old
 - ☐ 75 years old or older
-

What do you think this research is about?

Condition 4 vertical display: unsustainable top versus sustainable down

Dear respondent,

Thank you for participating in this research. For my studies at the Radboud University, I am conducting research about online shopping. The survey will last approximately 8-10 minutes. When completing the survey, it is important to remember that it is about your own personal opinion. This means that there are no right or wrong answers. Because this research is carried out under the responsibility of the Radboud University, you have guarantee that: You will be kept anonymous and your answers will not be provided to third parties under any circumstances. The results are not linked to your name and will be used only for this research. You can withdraw your participation at any time during the survey, you can also cancel your participation. Participation in this research does not entail any significant risks or inconveniences for you, there is no willful deception, and you are not confronted with offensive material. Your participation in this survey is completely voluntary. By continuing you indicate your agreement with participation. If you have any questions about the research please contact Astrid Hendriks and send an email to a.b.hendriks@hotmail.com or call 06-46008052. I hope I have informed you sufficiently and thank you in advance for your participation, this will enable me to graduate.

All the best, Astrid Hendriks

The survey will start now.

During this research you are confronted with several online shopping situations and asked to choose a product you would like to buy. It is important to view the assortment as if you are online shopping. Also, view the products as if all the prices across the different products are equivalent. After every display, you are asked to select one product that you would like to buy. You are asked to choose six products in total. After every product is chosen, you are asked a few questions.

Take a good look at the products and decide what product you would like to buy.



- ☐ Dark Roast Espresso Coffee Beans
- ☐ Slow Roasted Coffee Beans
- ☐ Regular Coffee Beans
- ☐ Fair Trade Dark Roast Espresso Coffee Beans
- ☐ Organic Slow Roasted Coffee Beans
- ☐ Bio Organic Regular Coffee Beans

How easy did you find it to visually process the display?

- ☐ Not easy at all
- ☐ Uneasy
- ☐ Neither Easy nor Uneasy
- ☐ Easy
- ☐ Very easy

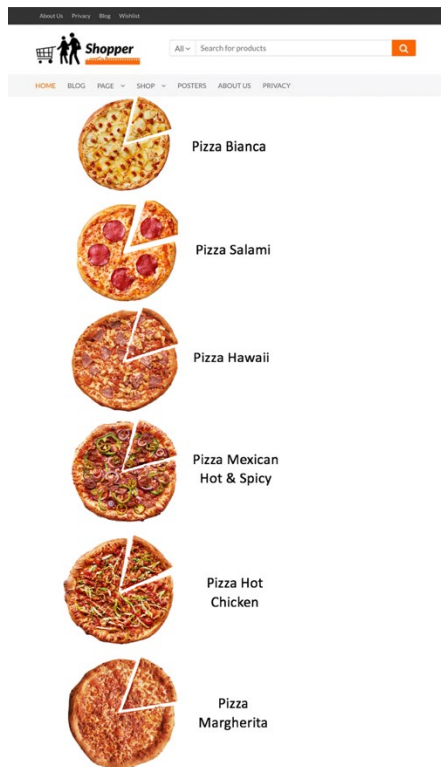
How difficult is it for you to visualize this display with your eyes closed?

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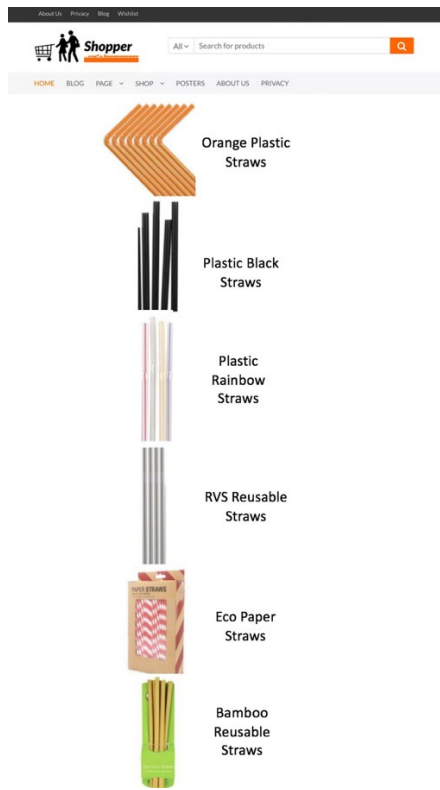
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 - ☐ 65 - 74 years old
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-

What do you think this research is about?

Appendix D Output Assumptions

		Variables in the Equation					
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	What is your gender?	.645	.397	2.630	1	.105	1.905
	What medium did you use to fill in the survey?	.070	.429	.026	1	.871	1.072
	VPbottlelog by VPbottletotal	-.387	.341	1.292	1	.256	.679
	VPbottlelog	1.735	1.640	1.118	1	.290	5.667
	Constant	-2.309	1.098	4.424	1	.035	.099

a. Variable(s) entered on step 1: What is your gender?, What medium did you use to fill in the survey?, VPbottlelog * VPbottletotal , VPbottlelog.

		Variables in the Equation					
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	What is your gender?	.212	.371	.328	1	.567	1.236
	What medium did you use to fill in the survey?	.604	.403	2.253	1	.133	1.830
	VPCoffeelog by VPcoffeetotal	-.145	1.085	.018	1	.894	.865
	VPcoffeetotal	-.133	2.117	.004	1	.950	.875
	Constant	-.354	2.808	.016	1	.900	.702

a. Variable(s) entered on step 1: What is your gender?, What medium did you use to fill in the survey?, VPCoffeelog * VPcoffeetotal , VPcoffeetotal.

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	What is your gender?	.240	.387	.386	1	.534	1.272
	What medium did you use to fill in the survey?	.228	.413	.305	1	.581	1.256
	VPstrawlog by VPstrawtotal	-1.919	1.221	2.468	1	.116	.147
	VPstrawtotal	3.884	2.514	2.387	1	.122	48.641
	Constant	-6.392	3.422	3.489	1	.062	.002

a. Variable(s) entered on step 1: What is your gender?, What medium did you use to fill in the survey?, VPstrawlog * VPstrawtotal , VPstrawtotal.

Variables in the Equation		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	What medium did you use to fill in the survey?	.413	.416	.987	1	.320	1.512
	What is your gender?	.827	.404	4.188	1	.041	2.287
	What is your age?	-.195	.172	1.294	1	.255	.823
	totalprocessingfluency by PFtotallog	.405	2.379	.029	1	.865	1.499
	totalprocessingfluency	-1.390	4.859	.082	1	.775	.249
	Constant	1.131	6.653	.029	1	.865	3.098

a. Variable(s) entered on step 1: What medium did you use to fill in the survey?, What is your gender?, What is your age?, totalprocessingfluency * PFtotallog , totalprocessingfluency.