The effect of eco-labels in contrast to greenwashing of personal care products using green visual attributes on e-commerce platforms.

Understanding the purchasing intentions of consumers in the Netherlands

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ABSTRACT

With the increasing environmental problems and the growing demand for eco-friendly products, green businesses are seen to be implementing green marketing strategies to highlight their green products. However, this also results in many businesses greenwashing their products to increase sales, which is why eco-labels are used to prove the authenticity of green products and fight greenwashing practices. Eco-labels are labels provided by third parties after strict examination of environmental requirements on the product or service. Despite substantial studies on green marketing and greenwashing, mainly focused on advertising and packaging, this study aims to fill the gap in the literature by explicitly focusing on the effectiveness of eco-labels in contrast to greenwashing using green visual attributes on e-commerce platforms. Additionally, during the pandemic, personal care products (PCPs) showed increasing sales, which is why this industry is an interesting field to look at. Drawing upon the theories of green marketing, greenwashing, and the effect of environmental concern on purchasing intentions, hypotheses were formulated and a theoretical model was built and tested. This eventually helped answer the research question regarding the effectiveness of ecolabels in contrast to greenwashing using green visual attributes. Hence, a between-subjects experiment is carried out in the form of an online survey with seven experimental conditions. After data cleaning, a total of 234 participants ($N = 234$) were included in this research, ensuring that each condition had at least 30 participants. The findings showed no significant difference in the purchasing intentions between eco-labeled PCPs and greenwashed PCPs using green visual attributes. In addition, environmental concern also found no moderating effect on the purchasing intentions on eco-labeled or greenwashed PCP using green visual attributes. Thus, it can be concluded that eco-labels do not affect the online purchasing intentions of consumers in the Netherlands and that environmental concern has no moderating effect. Overall, the results provided an in-depth understanding of the effectiveness of eco-labels and green visual attributes, which can act as a base for future research.

KEYWORDS: *Green Marketing, Eco-labeling, Greenwashing, Green Visual Attributes, E-commerce, Personal Care Products*

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Preface

Writing this Master's thesis amid the pandemic has been a challenging yet interesting journey, as I have encountered situations and questions I have never encountered before. However, I am proud to present the final results as a matter of hard work, perseverance, and support from those around me. The support I received kept me motivated throughout the whole period of writing this thesis, which is why I cannot imagine this challenging journey without them.

First and foremost, I would like to thank my supervisor Dr. Lijie Zheng. Thank you for your patience, guidance, and constant support throughout this process. I am truly thankful for the time you took for our meetings and your feedback that helped me constantly improve the quality of this thesis. Your enthusiasm and professionalism towards your students are truly inspiring. Secondly, I would like to thank my fellow classmates and friends, as they have been of great support to go through this together. They even offered me help in the middle of the night when I was stuck with questions, which I really appreciate. As this is my first quantitative thesis, there were a lot of uncertainties and insecurities. However, they occasionally asked about my progress and shared their knowledge about quantitative studies, which helped me a lot to get through this process.

Finally, I would like to thank my family, especially my parents. As first-generation immigrants, they have never finished school, which is why they were afraid that I would feel extra pressure to be the first one in the family to obtain a degree. However, throughout my academic years, I have never felt any pressure from them. Instead, they constantly encouraged me and showed me support which motivated me to do better. None of this would have been possible if it was not for them. Thank you so much for always trusting me and supporting me throughout these years.

1. Introduction

In recent years, studies on green marketing and greenwashing have been increasing in the context that there is a growing demand for eco-friendly products amongst consumers (Danciu, 2015). Many businesses implement green marketing strategies to inform the public about the companies' sustainable practices, stimulating consumers' purchasing intentions (Mahmoud, 2018). Several studies, such as Cherian and Jacob (2012), proved that one of the green marketing strategies found to be effective involves the eco-labeling of products, which are labels provided by certified third parties. However, the increasing demand for eco-friendly products also resulted in many businesses greenwashing their product through several green attributes (Szabo & Webster, 2020). These attributes include visual and verbal elements that highlight the characteristics of green products intending to mislead consumers and increase sales (Schmuck et al., 2018). As a result, the current proposed study aims to test the effectiveness of eco-labeling at the consumers' end in contrast with greenwashing using green visual attributes.

When looking into current studies regarding eco-labeling and greenwashing, it is clear that there is a debate about the effectiveness of greenwashing compared to eco-labeling (Shahrin et al., 2017). Previous studies on greenwashing focused more on product advertisements (Aagerup et al., 2019). However, Aagerup et al. (2019) found that product labels are more convincing compared to advertisements. Hence, many businesses instead invest in the production of greenwashed product labels. As Sharma and Kushwaha (2019) proved in their recent study that eco-labels could positively influence consumers purchasing intentions, the question remains whether consumers are aware of greenwashing in contrast to eco-labels and the effect on purchasing intentions. Thus, the proposed research will provide a direct answer to this question through an online experiment.

Positing this focused question in the Dutch market under the context of the pandemic, it can be found that personal care products (PCPs) showed increasing sales (Gu et al., 2021). To define PCPs, it follows the definition of products used for hygienic purposes, such as soaps and disinfectants (Brausch & Rand, 2011). Moreover, Euromonitor International (2020) found that the Netherlands is one of the ten countries with the highest percentage of increased sales in liquid soaps on e-commerce platforms, based on online product availability and out-of-stock rates. Therefore, it is interesting to focus this study on PCPs in the Netherlands as well as e-commerce platforms due to the increased online shopping behavior, which formulates the following research question:

To what extent does eco-labeling and greenwashing of personal care products using green visual attributes on e-commerce platforms affect the online purchasing intentions of consumers in the Netherlands?

1.1 Scientific relevance

Past research on green marketing and greenwashing has mainly focused on advertising and green packaging (Aagerup et al., 2019; Pan et al., 2021; Moorthy et al., 2021). However, product labels are found to be more effective compared to advertisements (Aagerup et al., 2019). Yet, there is still a limited amount of studies that examined the impact of eco-labels compared to greenwashing in the context of using green visual attributes on e-commerce platforms. By emphasizing the importance of eco-labels as green marketing tool on e-commerce platforms, this study aims to provide a unique perspective to existing studies comparing the effectiveness of eco-labels and green visual attributes.

Moreover, as green marketing is constantly evolving, the scientific relevance of this study is to address the current research gap in e-commerce platforms selling PCPs and demographically the focus on consumers in the Netherlands (Ruiz-Blanco et al., 2021). Hence, focusing on PCPs on e-commerce platforms has a scientific contribution, as the COVID-19 pandemic increased the online shopping behavior in this product category (Gu et al., 2021).

1.2 Societal relevance

The societal relevance draws upon several objectives. First, this research aims to offer insights into the effectiveness of eco-labeling in contrast to greenwashing with green visual attributes amongst consumers in the Netherlands. These insights can mainly be helpful for marketers or communication professionals in the e-commerce or personal care industry to understand the effectiveness of eco-labels and realize the critical role of information provision of green products on e-commerce platforms (Delmas & Gergaud, 2021). Second, the growing demand for eco-friendly and sustainable products amongst consumers indicates the importance of eco-labels, and in combination with which green visual attribute can increase or decrease consumers' purchasing intentions (Danciu, 2015). Therefore, companies can implement the information gained from this study to elevate their online business. Finally, from a consumer's perspective, this study will also contribute to a better

understanding of what eco-labeling entails and which green visual attributes businesses use to greenwash their products to increase sales.

1.3 Chapter outline

This paper is structured as follows. Chapter two discusses the joint review of the main concepts for this study – green marketing, greenwashing, green visual attributes, and environmental concern – which captures the essence of this study to guide the reader through the procedure. Chapter three discusses the methodology used for this study, with a detailed description of the research design, measurement, and operationalization for the theoretical concepts, including experimental designs, followed by procedure and a discussion on the validity and reliability of this study. Then, chapter four discusses the statistical results in line with the hypotheses for this study. Finally, chapter five reflects on the results and discusses the findings in comparison with the theories, as well as the limitations of this study and recommendations for future research.

2. Theoretical framework

The concepts presented throughout this paper should be properly grasped in order to comprehend the purpose of this study. Therefore, this chapter will discuss the key concepts related to the topic of this study supported by academic literature. Subsequently, this chapter will consist of a comprehensive literature review related to the concepts of green marketing, greenwashing, and the effect of environmental concern on purchasing intentions. This will be supported by hypotheses that will be tested to answer the research question and eventually a conceptual model. In the end, the joint review of these main concepts captures the essence of this study and gives a set of ideas that can serve as a steppingstone through the entire procedure.

2.1 Green marketing

Throughout the years, it has been found that environmental problems are a growing concern within the society, which leads businesses to implement strategies that conserve the environment and protect its natural resources (Mukonza & Swarts, 2019). Several industries have been taking chances to incorporate green marketing within their business strategies, investing in long-term advantages, and distinguishing themselves from competitors (Mukonza & Swarts, 2019). In fact, Cavicchi (2012, as cited in Mukonza & Swarts, 2019) discussed that the implementation of green marketing strategies has been considered the standard practice for businesses nowadays to communicate their business values towards consumers while reaching sustainable goals. However, there is still an ongoing debate about whether businesses can achieve their financial objectives while also improving societal and sustainable quality (Mukonza, Hinson, Adeola, Mogaji, & Kirgiz, 2021). As a result, rather than responding to societal and governmental pressure, stakeholders are investing more in the strategy and operational aspects to stimulate consumers' attitudes towards the organization (Mukonza et al., 2021).

Consequently, in the past few years, the consumption of environmentally friendly products has been rapidly increasing. Consumers are paying more attention to green products and whether businesses are engaging in green marketing strategies (Tsai et al., 2020). This phenomenon which reflects consumers' environmental concern in their purchasing behavior is also called green consumerism (Martins, 2021). Hence, the challenge in persuading customers to buy green products is to present reliable and credible information, which is why green marketing strategies should be well considered (Sedky & AbdelRaheem, 2021). Green

marketing is, therefore, a broad concept and has been used and interpreted in various ways by many scholars. In a broader sense, the concept of green marketing is generally regarded as a practice that includes business activities such as price, planning, promotion, and production to meet consumers' needs in a way that reduces the environmental impact (Polonsky, 1994). Looking back at how green marketing has evolved over the years, green products have become more accessible for businesses to produce and distribute and for consumers to purchase in-store and online, thanks to the developing resources and technologies (Ottman, 2011). In other words, green marketing has been an increasing trend, and new strategies have emerged to cover the greening of products (Ottman, 2011).

2.1.1 Green marketing in the personal care industry

As discussed in the previous paragraph, the severity of environmental problems has attained worrisome levels prompting various industries to implement green strategies in their operations. Hence, competitive industries need to find ways to differentiate themselves and their products to retain profits by highlighting the characteristics of green products (Sedky & AbdelRaheem, 2021). One of the many industries that is found to be doing so is the personal care industry. The personal care industry is according to Kahraman and Kazançoğlu (2019) a leading industry to implement green marketing strategies, as consumers are willing to pay more for green products that are related to self-care and personal health. As a result, eco-friendly and natural PCPs are reaching a higher level of sales compared to normal PCPs (Sedky & AbdelRaheem, 2021). However, this also results in many businesses greenwashing PCPs and making claims such as the use of organic, natural, or recycled ingredients to make their products look eco-friendly and increase sales (Kahraman & Kazançoğlu, 2019). A more in-depth literature review of greenwashing will be discussed later in this chapter.

Marketers from personal care industries are implementing green marketing strategies, as PCPs give unique perspectives to assess green consumers' ethics. Moreover, most consumers believe these goods to be a need, even at the most basic level of personal hygiene (Todd, 2004). Green consumer ethics can often be seen in marketing techniques for eco-friendly PCPs (Todd, 2004). To drive green consumer ethics, businesses are taking initiatives to raise consumers' awareness on their environmentally responsible practices, which is why green branding PCPs being crucial (Fatoki, 2020). Ha et al. (2021) discussed that the personal care industry is ready to invest in green technologies to promote eco-friendly PCPs and meet customers' expectations. Hence, many personal care brands already focus on green marketing aspects, such as green products, which refers to selling eco-friendly and ethically responsible

products with green labels (Kirgiz, 2016, as cited in Chairunnisa et al., 2019), and green promotion, which refers to all promotional activities including advertising and communication through packaging and websites that share specific information about the manufacturing process and other ecological values (Widyastuti et al., 2019). Ultimately, green marketing in the personal care industry is to emphasize the product as eco-friendly and sustainable. This strategy is considered a strength as it drives the green purchasing intentions of consumers (Nguyen & Le, 2020). To explain the concept of green purchasing intentions, green purchasing intentions is the consumers' intention to buy green products driven by their environmental concerns or motivations to protect and sustain the environment (Nguyen & Le, 2020). Hence, consumers are willing to pay for products that do not bring environmental harm compared to traditional products. Nowadays, products can easily be considered green, using several attributes tailored to the preference of consumers and showcasing environmental concerns. To prove the authenticity of green PCPs, eco-labeling can be used to increase consumer trust and stimulate green purchasing intentions (Nguyen & Le, 2020).

2.1.2 Eco-labeling and consumers' purchasing intentions

Consumers often have inadequate access to sustainable product information, such as the production process or the use of materials that would help them make green purchasing decisions (Delmas & Gergaud, 2021). Therefore, one of the important green marketing tools found to solve this problem is the implementation of eco-labels (Fouziya & Gracious, 2018). The aim of eco-labels is to eliminate obscure information between businesses and consumers by communicating trustworthy characteristics about the product's life cycle and its ecologically responsible qualities (Nguyen & Le, 2020). According to Delmas and Gergaud (2021), eco-labels usually have two main objectives: certification and communication. Certification summarizes the occurrence that third-party authorities recognize that the product meets certain standards to be labeled as a green product, whereas communication entails the labeling system that relays this information to its consumers (Delmas & Gergaud, 2021).

The effectiveness of eco-labels in reaching environmental and sustainable goals has sparked an ongoing debate between economists. However, a recent study by Van't Veld (2020) found that eco-labels positively motivate consumers to purchase environmentally friendly products, as their green purchasing behavior reflects personal moral feelings and provides them with comfort as well as the feeling to act socially responsible. Hence, it can be concluded that using eco-labels in the long term can help businesses reach their environmental and sustainable goals. However, one of the challenges that come with the use

of eco-labels is that consumers cannot guarantee the quality of the eco-labeled product, as consumers frequently feel that sustainability and profitability are mutually incompatible (Delmas & Gergaud, 2021). Additionally, Delmas and Gergaud (2021) mentioned that another challenge with eco-labels is that consumers might not be aware of the purpose of eco-labels or not recognize these labels. As a matter of fact, this confusion is caused because of the different types of eco-labels varying per country, with some countries having eco-labels issued by private organizations or manufacturers (Delmas & Gergaud, 2021). However, in Europe, there is only one eco-label for non-food products and services. This is the EU Eco-label, which is the official European environmental label for non-food products and services supported by EU member states (European Commission, 2021). According to the European Commission (2021), only products and services that fulfill strict environmental requirements throughout their lifecycle are given eco-labels.

With the widespread skepticism of traditional means of advertising and pushback against apparent greenwashing, green marketers turn to eco-labelers to drive purchases. According to Ottman (2011), green consumers are strongly influenced by recommendations and trusted third parties. Hence eco-labels issued by third parties act as useful tools for consumers to recognize authentic green products without extra effort. It follows that the use of eco-labels counters greenwashing and deceptive green claims, thereby proving the legitimacy of green products (Mukonza et al., 2021). In short, using eco-labels issued by third parties justifies the authenticity and credibility of green products, which results in consumers having a better sense of trust (Lanero et al., 2021). Nonetheless, Jeżewska-Zychowicz et al. (2020) found in their study that higher trust leads to higher purchasing intentions amongst consumers. Therefore, the use of eco-labels should lead to higher consumer purchases as it is a form of communication and trust towards the consumers. As a result, the following hypothesis is formulated:

H1: The presence of eco-labels on PCPs on e-commerce platforms increases consumer purchasing intentions.

2.2 Greenwashing

In a highly competitive market of consumer goods, real green businesses are seen to implement green marketing strategies to differentiate themselves from competitors. Green marketing is, therefore, not merely just a strategy to communicate the sustainable practices of businesses but is also found to be profitable, reaching a high level of sales (Jog & Singhal, 2019). However, the growing demand for eco-friendly products has created opportunities for many businesses to mislead consumers and drive purchasing intentions. This practice is also called greenwashing, which has been discussed by scholars such as Jog and Singhal (2019) in the past few years. To have a better understanding of the concept of greenwashing, greenwashing is a practice that aims to deceive consumers by promoting products that are not environmentally friendly as though they are by implementing characteristics of eco-friendly products or services (Kahraman & Kazançoğlu, 2019). A few attributes are therefore used to influence consumers' perceptions, which will be elaborated on later in this chapter as the main theoretical concepts for this study.

When green consumption became popular among consumers, green marketing and greenwashing also became practices for businesses to look out for. However, the concept of greenwashing was not used until the early 1980s by environmentalists to address companies that advertise themselves in the media to be protective of the environment while engaging in activities that are not sustainable (Watson, 2016, as cited in Topal et al., 2019). As a result, businesses that incorporate greenwashing practices might affect their reputation, as consumers are becoming more skeptical on the growing environmental awareness (Topal et al., 2019). Likewise, green consumers are paying more attention to businesses' corporate social responsibility (CSR) as they are said to be going green. The term greenwashing, therefore, is a sensitive topic for businesses that communicate their CSR, as greenwashing can be quickly overseen in CSR practices and observed by green consumers (Wu et al., 2020). The personal care industry is one example for this. Personal care brands might be informing their consumers that they are using sustainable materials; however, the working environment and production process are often not as eco-friendly as it seems, which directs towards the practice of greenwashing (Wu et al., 2020). Even though CSR is an interesting topic to look at when discussing greenwashing, this study will not dive deeper into this topic as the focus is not to gain a deeper understanding of how consumers perceive CSR in contrast to greenwashing, but this study tries to examine the effectiveness of eco-labels from a business perspective in contrast to greenwashing using green visual attributes.

Schmuck et al. (2018) discussed a few common practices in the context of green advertising and greenwashing products. Namely, the communicative aspects, which includes verbal or visual-based attributes highlighting the characteristics of green products (Schmuck et al., 2018). Consequently, greenwashing practices can appear ambiguous or even include deceptive information regarding the greenness of the product (Jog & Singhal, 2019). Hence, without an eco-label, any firm can make green claims as there is no proof of whether it is authentic.

2.2.1 The effect of using green colors as visual attribute in greenwashing

According to Guyader et al. (2017), consumers need to be stimulated with visual attributes to recognize eco-friendly products. Therefore, businesses operate as gatekeepers, signaling and arranging green product attributes to guide consumers along the way (Guyader et al., 2017). One of the attributes to do so is the use of colors, as colors are crucial in creating a brand's image, and it was found that consumers directly draw connections between colors and subjects (Williams, 2007, as cited in Fonseca, 2015).

Businesses that are greenwashing are seen to be using green as a dominant color in their communication, packaging, or advertisements, as green is proved to be associated with nature, organic, and environmentally friendly (Fonseca, 2015). Hence, in the eyes of consumers, when businesses are using green as a dominant color for packaging, for example, they tend to assume that those products are eco-friendly even when they are not, which means that consumers are exposed to the intended effect of greenwashing (Guyader et al., 2017). However, as consumers nowadays have grown more skeptical of green products, Guyader et al. (2017) argued in their study that excessive use of green for the product might result in doubts and leads to distrust in eco-friendly products. Hence, consumers need third-party authorizations to confirm that these products are truly environmentally-friendly (Mukonza et al., 2021). Following this argument, the experiment will draw a comparison between the purchasing intentions of greenwashed PCPs using the color green as a visual attribute and PCPs with eco-label. As a result, the following hypothesis is formulated:

H2: Greenwashed PCPs using the color green as green visual attribute on e-commerce platforms results in lower purchasing intentions compared to PCPs with eco-labels.

2.2.2 The effect of green phrases as visual attribute in greenwashing

In the field of marketing and advertising, the use of false claims is a widespread problem. Scholars like Schmuck et al. (2018) have been discussing this phenomenon in the context of green advertising. It has been found that there are two methods to communicate these false assertations, that is false information and vague information (Schmuck et al., 2018). False information entails businesses that are making false claims about green products, while vague information entails excessively broad or insufficiently defined information that gives the wrong ideas (Schmuck et al., 2018). For example, PCPs advertising that their plastic packaging causes no harm to the environment can be considered a false claim. Vague claims, on the other hand, can entail written phrases that are too broad and give the wrong impression, for example, PCPs that claim to be all natural. Hence, both methods are considered greenwashing using written phrases that characterizes green products.

Although, as previously stated that green consumers are becoming more skeptical and wary of greenwashing, it is still a common practice in marketing, especially the use of written phrases to vaguely present the characteristics of green products (Schmuck et al., 2018). As a result, businesses can generate false or manipulative claims in written phrases that lack clarity and only highlight the sustainable part but exclude other harmful environmental practices that can influence the awareness of consumers (Ulusoy & Barretta, 2016). Additionally, Mukonza et al. (2021) discussed that businesses use terms such as sustainable, eco-friendly, save the planet, and other key phrases related to nature and the environment to make green claims and greenwash their products. Hence, previous studies from Ulusoy and Barretta (2016) concluded that consumers want to invest in brands that are honest and trustworthy when communicating ecological and societal values. It follows that using green claims may negatively affect consumers' trust towards brands and therefore influences consumers purchasing intentions (Ulusoy & Barretta, 2016). In line with these findings, it will be tested whether products making green claims result in lower purchasing intentions compared to products that are authorized with an eco-label as green product. Thus, the following hypothesis is formulated:

H3: Greenwashed PCPs using green phrases as green visual attribute on e-commerce platforms results in lower purchasing intentions compared to PCPs with eco-label.

2.2.3 The effect of symbolic images as visual attribute in greenwashing

While most studies have focused on green claims, only a few researchers have looked at the impact of symbolic images. This is also one of the visual attributes of communicating green messages. As discussed above, the communication of green messages can be presented in various ways such as color, written phrases, but also symbolic images. Hartmann and Apaolaza-Ibáñez (2009, as cited in Parquel et al., 2018) stated that images are attributes to display intrinsic meanings and prompt the public to draw connections. In the context of greenwashing and green communication, specific visual elements related to sustainability and the environment can be used to display the characteristics of green products (Parguel et al., 2018). Moreover, the concept of being green is frequently expressed through symbolic images that use natural imagery to create visual links with nature without making any claims (Parguel et al., 2018).

When it comes to business strategy and communication, images can be an essential part to portray the brands' identity and the product they are selling (Bell et al., 2014, as cited in Kassinis & Panayiotou, 2018). Hence, the use of images can act as a visual approach to distract consumers from the company's past behaviors or practices that do not align with consumers' expectations (Kassinis & Panayiotou, 2018). As a result, businesses incorporate a manipulative image to direct consumers to certain beliefs, which influences consumers' intentions, trust and enhances authenticity (Kassinis & Panayiotou, 2018). There are organizations that have been underestimating the power of visual images. However, visual images are considered one of the most effective strategies to convey messages and connect viewers with storylines that can be interpreted visually (Szabo & Webster, 2020). Hence, the use of symbolic images represents meanings and draws upon representations. These representations are strongly connected to experiences and basic elements that individuals daily encounter, which is why in the context of communication, visuals are the quickest approach to convey information (Van Leeuwen, 2001, p. 100). In addition, Kahraman and Kazançoğlu (2019) stated that symbols are required to stimulate the sense-making of audiences, and using visual symbolic cues related to nature as a stimulus for greenwashing can communicate conveyed messages without the use of written messages.

Torelli et al. (2020) discussed in their study to particularly pay attention to the important role of images and rhetorical messages when communicating green practices. The use of symbolic images may have advantages as a communicative approach; however, it also opens up the possibility that issues may arise when symbolic images are perceived as greenwash by consumers (Torelli et al., 2020). Following this argument, the experiment will

test the difference between the purchasing intentions of greenwashed PCPs, PCPs without eco-label with symbolic images as visual attribute, and PCPs authorized with an eco-label. Thus, the following hypothesis is formulated:

H4: Greenwashed PCPs using nature-associated symbolic images as green visual attribute on e-commerce platforms results in lower purchasing intention compared to PCPs with eco-label.

2.3 The moderation effect of environmental concern

The past decade has seen an increasing interest in environmental problems, and natural resources are becoming scarcer (Rusyani et al., 2021). Hence, society is worried about the future of the environment, which is reflected in their purchasing behaviors when purchasing products (Rusyani et al., 2021). Not only are consumers changing their perceptions on eco-friendly products, but businesses are also found in line to incorporate sustainable practices, such as in their production processes (Rusyani et al., 2021). Furthermore, Bulut et al. (2021) mentioned that the awareness on environmental issues is growing amongst consumers, which is why they start to seek out for eco-friendlier products and services rather than their usual buying habits. Especially when it comes to personal care and health products, consumers are being more sensitive to natural and sustainable practices (Kahraman & Kazançoğlu, 2019). Overall, it can be concluded that consumers are changing their purchasing behaviors when it comes to green products, as environmental concern is rising. However, there are several factors that influence the level of environmental concern of each individual. Rusyani et al. (2021) discussed these factors to be awareness, competence, and commitment. Subsequently, consumers that are highly committed to the environment are referred to as green consumers, which are consumers that are paying extra attention to products that harm the environment (Rusyani et al., 2021). Thus, environmental concern has a strong influence on how consumers perceive green products.

In the field of green marketing, environmental concern has been stressed as an important cognitive measure to foresee one's environmentally friendly behavior (Jaiswal & Kant, 2018). Environmental concern, therefore, refers to the individual's awareness of environmental issues and their willingness to address them (Van Liere & Dunlap, 1981, as cited in Jaiswal & Kant, 2018). Furthermore, it entails a sense of commitment to safeguard the environment, driven by altruistic motivations that can be seen in their green purchasing

behaviors (Prakash et al., 2019). Hence, environmental concern can indirectly lead to certain actions, influencing beliefs and attitudes in specific circumstances, such as consumers' purchasing behaviors (Chen & Tung, 2014).

In a previous study by Matthes et al. (2014), it was found that consumers have different attitudes to persuasive appeals and purchasing intentions. Consequently, an essential predictor for purchasing intention is environmental concern, which is described as consumers acknowledging environmental impacts and being ready to intervene (Nabilla, 2019). As Nabilla (2019) has discussed in her study, consumers with high environmental concerns are particularly sensitive when it comes to purchasing green products. In line with these theories, it will be tested whether environmental concern has a moderating role on the purchasing intentions between eco-labeling and greenwashing of PCPs. Hence, the following hypotheses are formulated:

H5: The relative effectiveness of eco-labeling on the purchasing intention of PCPs is moderated by environmental concern.

H6: The relative effectiveness of greenwashing on the purchasing intention of PCPs is moderated by environmental concern.

2.4 Conceptual model

As a result of the theoretical framework and the hypotheses formulated to answer the research question, a conceptual model is illustrated in figure 2.1.

Figure 2.1. Conceptual model
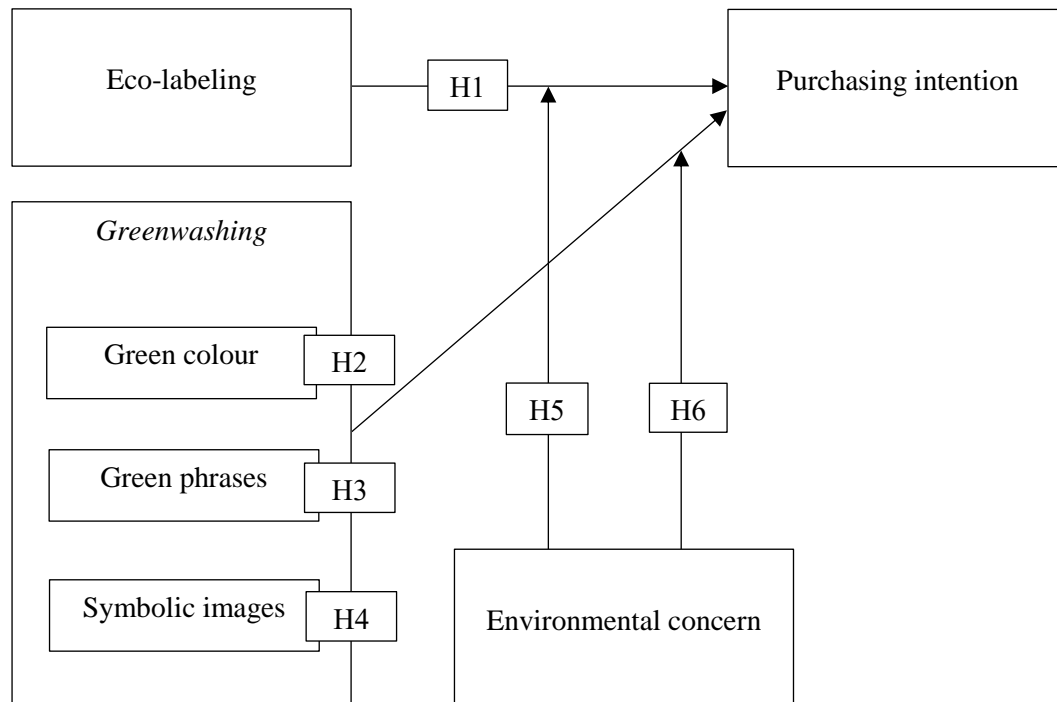
3. Methodology

This study takes on a deductive approach to test the theories that are expected to explain the relation between two or more variables (Babbie, 2014). Moreover, the chosen methodology for this research is a quantitative approach to examine the effect of eco-labeling and greenwashing with green visual attributes on the purchasing intentions of consumers in the Netherlands. According to Babbie (2014), quantitative studies make observations more explicit as it is easier to compare and summarize large sets of data.

Following this argumentation, the next chapters will discuss the research design, as well as operationalizations of the concepts, experimental designs, and measurements. Then the procedure will be described, which includes the pilot test, how the samples are selected, the distribution of the survey, as well as ethical concerns and the data analysis method. Finally, this chapter will elaborate on the validity and reliability of this study.

3.1 Research design

For this study, a between-subjects experiment is carried out facilitated by random assignments, which assigns each participant of the experiment to only one of the conditions (Allen, 2017). As a result, relations between the variables can be compared to test the hypotheses without any bias because the personal interests of the participants are not taken into consideration while assigning the groups (Neuman, 2011). Moreover, this study is interested in the effect of two independent variables: (1) eco-labels and (2) green visual attributes; with green visual attributes having three levels, the 2x3 factorial design will be used for this experimental research.

Based on the hypotheses derived from the theoretical framework, seven conditions were put together with one condition for the control group, referring to the group that will not be exposed to any experimental stimulus. According to Neuman (2011), a control group is crucial in experimental research to eliminate the effects of the treatments and induce the "real-life" settings. Furthermore, the following six conditions with different treatments are built upon green visual attributes and eco-labeling, as displayed in table 3.1. The images designed for the experimental conditions can be found in Appendix B. Additionally, the experiment is done in the form of an online survey as the most feasible approach, because online surveys can help reach larger audiences efficiently within a short timeframe (Gordon & McNew, 2008). Another benefit according to Gordon and McNew (2008) doing online surveys is the option to respond anonymously. Although it is possible for respondents to

leave personal information, having the option to remain anonymous while filling in the survey would stimulate participation. As a result, doing the experiment in the form of an online survey will allow to collect enough participants for each condition within the timeframe of this study. In addition, the uncertainties with COVID-19 regulations might affect the availability of the participants for the experiment. With an online approach, this risk will be minimized. Finally, conducting this experiment online enhances the experience of the participants in the context of online shopping on e-commerce platforms. Therefore, participants were asked to imagine themselves in a situation where they are purchasing hand soap online, improving the effectiveness of the experiment. Hence, this experiment focuses on purchasing hand soaps online, as the introduction already discussed that the Netherlands has the biggest percentage of increased sales in liquid hand soaps on e-commerce platforms during the pandemic (Euromonitor International, 2021).

Table 3.1: 2x3 factorial design conditions

		Eco-labeling	
		None	**Applied**
	Green color	(1) Green color	(2) Green color + eco-label
Green visual attributes	**Green phrases**	(3) Green phrases	(4) Green phrases + eco-label
	Symbolic images	(5) Symbolic images	(6) Symbolic images + eco-label

3.2 Measurements and operationalization

In order to test the hypotheses for this study, an online questionnaire was designed using Qualtrics, a web-based survey software. The experiment is conducted by designing a mock-up e-commerce product page for hand soaps, adding the experimental stimulus to each condition: (1) Using green as a dominant color on the webpage, (2) same condition but with eco-label presented, (3) Including green phrases for example, "organic hand soap" as product title and "100% sustainable materials" in the product description (4) Presents this condition with eco-label, (5) Using nature associated symbolic images, for example, a visual symbol of a leaf or earth globe, (6) Presents symbolic images with eco-label.

To incorporate these different treatments effectively, the lay-out of the e-commerce product page remained the same for each condition, except for the treatments and stimuli that are applied. Hence, an imaginary hand soap brand was created named "THE HANDSOAP", in which all respondents were shown the same brand. As this study is interested in the effect of various green visual attributes in contrast to eco-labels displayed on e-commerce platforms, the experimental treatments were adapted in the product descriptions of the product page. In addition, to avoid interfering with the experiment, the product image used for the product page features a neutral hand soap bottle as its foundation, with only the brand's name displayed without additional images or elements referring to green packaging.

Moreover, the design of the product page is created accordingly to the levels of green visual attributes and eco-labeling guided by the literature review. The key objective of the visuals is to create a persuasive message to communicate the manipulations clearly, while maintaining consistency in wording and layout between different conditions. Therefore, the experimental images were designed drawing upon e-commerce product page standards selling PCPs. Likewise, the price (€10.00) displayed on the product page is based on the average bottle of higher-end hand soaps sold in the Netherlands, such as Sebamed (n.d.) and Rituals (2022). To ensure the quality of the experiment and to test the effectiveness of the manipulations, a pilot test will be conducted before the actual experiment (Neuman, 2011). These results will be further discussed later in this chapter. First, we will go more into detail about the operationalization and measurement of the main theoretical concepts for this study, followed by the experimental designs for the conditions.

3.2.1 Purchasing intentions

The purchasing intentions are measured using a numerical scale from 0 = unlikely to 100 = very likely, using a slider in Qualtrics to indicate the level of likeliness connected to the question *"Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?"* Hence, a numerical scale is compatible to differentiate between high and low purchasing intentions by comparing the mean of the results (Gediminas et al., 2017). Additionally, the participants are asked to take one to two minutes to carefully look at the product information on the product page, followed by *"Consider if you have to spend €10, - on a bottle of hand soap…"*. This enables the participants to reflect on the fact that they have to spend €10, - on a bottle of hand soap, which most likely reduces the influence of the price on their purchasing intentions. However, to further lessen the risk of price influencing purchasing intentions, a second question is added asking how much the participants are willing to pay in euros (€) on the bottle of hand soap displayed. To measure the outcome, this question uses a numerical open scale, which enables the data to analyze and compare high or low purchasing intentions based on the mean of their answers.

3.2.2 Environmental concern

Finally, to test the final hypotheses, which includes the relative effectiveness of eco-labeling or greenwashing on purchasing intentions moderated by environmental concern, environmental concern will be measured according to the scale of Kim and Choi (2005) and Fuji (2006) as cited in Chen and Tung (2014). The scale contains seven statements (1) Mankind is severely abusing the environment, (2) When humans interfere with nature it often produces disastrous consequences, (3) The balance of nature is very delicate and easily upset, (4) Humans must live in harmony with nature in order to survive, (5) I think environmental problems are very important, (6) I think environmental problems cannot be ignored, (7) I think we should care about environmental problems. These scales are measured with a 7-point Likert scale from 1= strongly disagree to 7= strongly agree. In addition, to ensure the reliability of the scale, a reliability and factor analysis will be applied, which will be further discussed in the chapter on validity and reliability.

3.2.3 Green visual attributes and eco-labels

Eco-labels. As mentioned before, table 3.1 summarizes the different levels and conditions of eco-labels that are demonstrated to the participants. The green visual attributes in this study are divided into three levels (1) green color, (2) green phrases and (3) symbolic images. The effectiveness of green visual attributes and how this affects consumer purchasing intentions are measured using these three key components. Consequently, in the 2x3 factorial design, eco-label has two levels with eco-label applied or not applied. When eco-labels are applied it means that the product is authorized as green product. When not, the products are considered as greenwashing (Mukonza et al., 2021).

For the experimental images, the EU eco-label is used that is supported by the European Commission (2021). Therefore, to test the hypotheses for this study, the eco-labels are either applied or not applied on the product page (see Appendix B).

Green color. In line with the extensive literature review, this component applies the color green on the product page as dominant color, as the color green associates itself with nature and environment (Fonseca, 2015)**.** However, during the pre-test, it was found that the color green was not dominant enough because it was only applied in the text color and buttons. Therefore, the image is revised to a full green color background for the product page to emphasize it more as dominant color.

Green phrases. Using green phrases has been considered an effective communication technique to influence the purchasing behavior of consumers (Roy et al., 2019). As Mukonza et al. (2021) have discussed, words associated with sustainability and nature are common greenwashing techniques for products. Therefore, this experimental treatment incorporated keywords such as "Organic" hand soap, "100% natural", "sustainable", "eco-friendly" and "save the planet" to highlight the common green phrases used as green visual attributes.

Symbolic images. The third green visual attribute is the use of symbolic images. Therefore, visual symbolic images that are related to natural elements are incorporated to test this component (Kahraman & Kazançoğlu, 2019). To be more specific, the product page incorporated iconography of leaves, recycling, and the planet in the description of the product. Additionally, to strengthen the symbolic cues for this treatment, leaves are also used in the background of the product page to connect it with the theme of nature.

3.2.4 Manipulation check

To make sure that the participants are exposed to the intended effect of the experiment and to increase the internal validity, a manipulation check is added directly after the experimental image (Neuman, 2011). For the two levels of eco-labels, each condition applied the manipulation check with the question: *"Did the product page contain this certified eco-label?"* with the eco-label displayed for clarification. The second manipulation question is related to the experimental image the participants were exposed to. As displayed before, the 2x3 factorial design showed three levels for green visual attributes. Therefore, three questions were formulated to test the intended effect: (1) *Was the product page dominated by the color green?* (2) *Did the product page contain any words related to green products? (e.g., organic, natural, sustainable, eco-friendly etc.)* and (3) *Did the product contain any symbolic images? (e.g., leaves, recycling icon, globe etc.)* As a result, each of these questions were linked to the designated condition.

The participants are given the choice to answer the manipulation question with "yes," "no" or "I don't know,". Hence, each condition has an expected answer, which can help to check whether the participants are exposed to the treatments of this experiment correctly. Moreover, this will ensure the internal validity, because only the data from participants who are correctly exposed to the experimental treatments will be used for further analysis (Neuman, 2011).

3.3 Procedure

The online survey consisted of four blocks in total. The first block contained the introduction and a filtering question to make sure that the participants were fitting the sample for this study, which are consumers in the Netherlands. The second block exposes the participants to one of the conditions using a randomizer. Additionally, this block measures the purchasing intentions with two questions as mentioned in chapter 3.2.1. Third, the participants are asked to indicate to what extent they agree with the statements that measures the concept of environmental concern (Chen & Tung, 2014). Finally, the survey contained some demographic questions, including gender, age, and educational level. Demographic questions are commonly used to identify the characteristics of the respondents and are frequently placed at the end of the questionnaire to limit the risk of them failing to finish the questionnaire (Lavrakas, 2008). Hence, demographic questions are not the key components to

answer the research question for this study and will allow the participants to answer the core questions first.

The design of the experiment followed three iterations to make sure that errors in the online experiment are minimized. Firstly, a pre-test is conducted for the experimental images, which can be found in Appendix A, to test the independent variables and whether the treatments are communicated correctly. Based on those findings; the conditions are revised to make the manipulations more noticeable. As a follow up, a pilot test is conducted for the online questionnaire and experimental images after the first revision from the pre-test. The process of the pilot test will be further discussed in the next chapter.

3.3.1 Pilot test

Prior to the data collection, a pilot test was conducted on the experiment. The pilot test is set to ensure the validity and to test the clarity of the manipulations towards the participants (Vargas et al., 2017). According to Holton and Burnett (2005), a pilot test should be carried out with samplings similar to the actual sample for this study. The sampling criteria for this study is consumers in the Netherlands above 18 years old. These broad criteria are supposed to result in a varied group of people with a wide range of age and cultural background. As a result, the participants for the pilot study were recruited according to these criteria and selected from the researcher's network, taking into consideration to form a group of participants with diverse backgrounds and retrieve insights from different perspectives.

The pilot test was conducted twice, one try-out stage where the participants were informed about the study to encourage them to be critical for further revision, and one where no information was given about the study to test the clarity and catch inevitable errors which affect the validity and reliability (Dilman, 2000, as cited in Holton & Burnett, 2005). Moreover, the participants were interviewed after the pilot test for critical feedback to enhance the quality of this research. As a result, the pilot test yielded some noteworthy findings. Firstly, a majority of the participants filled out the survey experiment on their mobile phone, as this was the most accessible device. However, the image of the product page was found to be too large for mobile phones, which affected the image view and the likeability slider in the questionnaire.

Secondly, the price (€2.50) was considered cheap, while it is derived from an average bottle of hand soap sold in the Netherlands from stores such as the Kruidvat (n.d.) and Etos ((n.d.). According to the participants from the pilot test, the cheap price resulted in a higher

likeability to purchase the product. In addition, the participants stated that with a higher price, they would pay more attention to the product information to see its worthiness. Therefore, a higher price (€10, -) is used based on the average of higher-end hand soaps such as Sebamed (n.d.) and Rituals (2022). Hence, this confirms that price can be an influential factor to consumers, which is why the additional question to measure purchasing intentions is added as described in measurement and operationalization.

Third, the question stated in the experiment asks participants to take one to two minutes to view the product page. However, it was found that the term product page directed the attention more towards the product image and not product information. Therefore, the wording of the question has been specified into product information. Taken these test results into consideration, final revises have been made for the experiment to be distributed. The final results of the online questionnaire can be found in Appendix C.

3.3.2 Sampling and data collection

The unit of analysis for this study is individual consumers in the Netherlands aged 18 years or older. According to Babbie (2014, p. 98), if the study is generalizing a group, it still looks at the behavior of the individual. Subsequently, this study focuses on consumers in the Netherlands aged 18 years or older because this age group is considered to be more self-reliant and have greater control over their purchasing habits (Girish, 2011). In the introduction of the questionnaire is described that participants have to be 18 years or older to proceed further with the experiment. This is not only because it is a sampling criteria, but also because of ethical concerns, which will be further described in the next chapter. However, it has been taken into consideration that participants might overlook this information, which is why demographic questions are added at the end of the survey, including age for data cleaning purposes.

According to Field and Hole (2003), between-subjects experiments typically consist of 10 to 20 participants per condition, as it is believed to be sufficient. However, to increase the representativeness, this study aimed to recruit at least 25 participants per condition, with seven conditions in mind this results in a minimum of 175 participants in total. The data collection started after the pilot test and final revisions of the experiment, from 19th of April 2022 until 4th of May 2022, which is approximately two weeks. Furthermore, this research mainly focuses on collecting data from consumers in the Netherlands; therefore, snowball and convenient sampling are used which is a form of a nonprobability sampling method. According to Babbie (2014, p. 188), snowball sampling is a procedure where the researcher

collects data from a few participants, which then asks them to suggest additional people to participate in the study. Therefore, a greater audience can be reached, which makes it feasible to recruit a sufficient number of participants in the proposed timeframe. To ensure a diverse dataset based on age and cultural background, the survey is distributed amongst different age groups from the researchers network and further distributed from the network of the participants. However, snowball and convenient sampling might result in participants distributing the survey to others that does not fit within the criteria for this study. To make sure that the data is only retrieved from participants in the Netherlands, a filtering question is added at the beginning of the survey. Filtering questions are used to direct respondents through the questionnaire to avoid irrelevant information (Lavrakas, 2008). Hence, the question is whether the participants are currently living in the Netherlands. When participants select "no" as an answer, they will immediately be directed to the end of the questionnaire, as they do not fit within the sampling criteria. Furthermore, the participants were informed to participate in a study related to purchasing intentions of green products. It is important that the specific purpose of the experiment will not be given away, but just a general idea. Therefore the information regarding greenwashing and eco-labels will not be mentioned in the introduction. Moreover, the introduction discusses some criteria, which the participant have to agree on to go further in the process. This will be further discussed in detail in the next section; ethical concerns.

3.4 Ethical concerns

To protect participants from any harm in the experiment, ethical considerations must be taken into account by researchers (Homburg et al., 2022). Before starting the experiment, the general purpose of the study is communicated, which allows the participants to voluntarily decide whether they want to take part in the study or not through informed consent. Additionally, the approximate time of the experiment is informed, which is three to five minutes, as well as the researchers' contact information in case of any questions. Second, the experiment will not ask for any sensitive information that makes the participant feel uncomfortable. In any case, the experiment will ensure that participants can quit any time if feeling uncomfortable, without consequences. Finally, data will be collected anonymously and only used for the purpose of this study. By applying these criteria and informing participants about the ethical considerations, this study aims to find a balance between the value of the study and minimizing potential harm towards participants (Babbie, 2014).

3.5 Data analysis

The first step in the data analysis procedure will adapt a factor analysis to ensure that the number of factors for *'environmental concern'* is one. Secondly, a reliability analysis will be carried out to measure the internal consistency with the Cronbach's alpha coefficient. Then, based on the research question and the formulated hypotheses, an independent sample t-test will be used for the analysis of hypotheses one to four. The independent sample t-test uses two categorical variables as independent variable and one continuous as dependent variable (Pallant, 2020). Because this study is comparing two conditions, which are categorical – eco-labeling and green visual attributes – on the purchasing intentions, which is the continuous dependent variable, an independent sample t-test is considered the best approach to analyze these results. Moreover, an independent sample t-test draws upon the mean scores between two groups and test if there are significant differences (Pallant, 2020).

For the final two hypotheses testing the moderation effect of environmental concern, a moderated multiple regression analysis will be conducted. The moderated multiple regression analysis is aimed to test the significance of eco-labeling and greenwashing on purchasing intentions with the level of environmental concern (Pallant, 2020). As mentioned previously, environmental concern will be measured according to the scale of Chen and Tung (2014). However, when selecting measurements scales, it is important that these scales are consistent and reliable, to make sure that the scales are measuring what needs to be measured (Pallant, 2020)

3.6 Validity and reliability

To ensure the quality of this study, validity and reliability are two technical aspects to take into account (Babbie, 2014). According to Babbie (2014), validity refers to the extent that the concepts used in this study sufficiently reflects the meaning, and measures what it is supposed to measure. Though, the ultimate validity cannot be proved, there are some methods to enhance the validity in a study (Babbie, 2014). Within experiments, internal validity can be enhanced by using a manipulation check. A manipulation check verifies the theoretical variables, and measures if the participants are exposed to the intended effect of the experiment (Neuman, 2011). As previously discussed, the manipulation checks for this study were added right after the experimental images and reviewed during the pre-test and pilot test. Though internal validity is improved by manipulation checks, the issue of external validity would still exist. According to Neuman (2011), external validity concerns the

representativeness and generalization of research findings. To minimize the risk that the population is generalized, this research draws upon a random sampling process, distributing the questionnaire to populations from different age groups and backgrounds to make sure that a diverse dataset is retrieved.

Additionally, by ensuring the internal consistency of the measurement scales, reliability can be increased (Pallant, 2020). Therefore, factor and reliability analysis are applied to confirm the single loading of variance and test the reliability of the pre-existing scales retrieved from Chen and Tung (2014), which quantifies the concept of environmental concern. According to Pallant (2020), a factor analysis is a data reduction approach and summarizes large sets of variables into relatively smaller components. Moreover, the reliability is calculated using the Cronbach's alpha coefficient. Pallant (2020), indicated that the Cronbach's alpha coefficients should be above .70 ($\alpha = .70$) to be considered internal consistent. The results of these analyses can be found in the next chapter results.

4. Results

In this chapter the results of the data analysis will be presented. The first section will elaborate on the data cleaning process. Then, the results of the preliminary analysis will be presented, which includes the demographic information, the factor and reliability analysis on the pre-existing measurements scales. Finally, the results of the analysis will be discussed which test the hypotheses of this study.

4.1 Data cleaning

Prior to the data analysis process, the data collected must be cleaned through IBM SPSS, a statistical software which will also be used to do the analysis. Data cleaning is essential as it helps to detect errors in the dataset, for example values that seem out of range, which might manipulate the correlation of the analysis (Pallant, 2020).

First, the data is cleaned based on incomplete progress. These are respondents who did not completely fill in the questionnaire or directed to the end of the questionnaire through the filtering question. Hence, respondents that filled in the questionnaire until demographic questions are kept for the analysis, as demographic data is not crucial for the main purpose of this study. Then, data is deleted from participants who did not pass the manipulation check, as it is essential for this study that participants are exposed to the intended effect correctly (Neuman, 2011). Finally, some items were not exported properly from Qualtrics to SPSS, these needed to be recoded to match the responses with the correct values. After having cleaned the dataset, the data analysis could start.

4.2 Data normalization

According to Pallant (2020, p. 525), the t-test assumes that the scores of the dependent variables are normally distributed. However, this is not always the case. Fortunately, with a large sample size this assumption should not have any significant consequences, as Pallant (2020, p. 525) stated that t-tests are robust. Nevertheless, a normality test is still conducted as preparation for the analysis to test the assumption and confirm if the purchasing intentions between experimental conditions are normally distributed. The results of the Kolmogorov-Smirnov can indicate the normality of the collected data. Hence, an insignificant value ($p > .05$) means that the data is normally distributed (Pallant, 2020, p. 167).

The findings of the normality test on the dependent variables; *'Likelihood'* and *'WillingtoPay'* (table 4.1), demonstrates that some of the conditions have a p-value of <.05, which means that the data of these conditions are not normally distributed. Additionally, it is found that both variables; likelihood and willingness to pay, measuring purchasing intentions, are positively skewed. As a result, a data normalization procedure is performed on both variables to test if the normality of the data distribution can be improved (Osborne, 2010).

Table 4.1. Normality test on *'Likelihood'* and *'WillingtoPay'*

	Condition	Kolmogorov-Smirnov[a]		
		Statistic	df	*p*
Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?	Control	.15	29	.120
	Green color	.09	39	.200
	Green color + eco-label	.17	40	.007**
	Green phrases	.13	28	.200
	Green phrases + eco-label	.19	40	.001***
	Symbols	.14	34	.106
	Symbols + eco-label	.15	33	.050
If given the choice, how much would you spend in euros (€) on this bottle of hand soap?	Control	.20	29	.004**
	Green color	.21	39	.001***
	Green color + eco-label	.19	40	.001***
	Green phrases	.16	28	.057
	Green phrases + eco-label	.20	40	.001***
	Symbols	.20	34	.002**
	Symbols + eco-label	.17	33	.017*

Notes: [a] Lilliefors Significance Correction

Significance: *p<.05 **p<.01 ***p<.001

Van den Berg (2022), discusses two data normalization techniques for data that are positively skewed. The first technique uses the logarithmic transformation. As a result, two new variables are computed for likelihood and willingness to pay. These new variables are created by using *log10*+1 and named '*logLikelihood*' and '*logWillingtoPay*'. However, the procedure did not have its intended effects, as the p-value of the conditions remained <.05 (Appendix D). For this reason, another technique discussed by Van den Berg (2022) will be used to test if the data normalization can be improved. This second technique uses square root and is computed by *sqrt*(oldvar). Hence, two new variables are computed according to this technique and named '*sqrt_Likelihood*' and '*sqrt_WillingtoPay*'. As it can be seen in table 4.2, some p-values of the conditions remained <.05, however the values do show some improvements compared to the variables prior to the data normalization procedure. As a result, the data analysis is conducted using these new variables normalized with square root.

Table 4.2. Normality test on *'sqrt_Likelihood'* and *'sqrt_WillingtoPay'*

	Condition	Kolmogorov-Smirnov[a]		
		Statistic	df	*p*
Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?	Control	.13	29	.200
	Green color	.10	39	.200
	Green color + eco-label	.10	40	.200
	Green phrases	.18	28	.020**
	Green phrases + eco-label	.12	40	.134
	Symbols	.14	34	.076
	Symbols + eco-label	.12	33	.200
If given the choice, how much would you spend in euros (€) on this bottle of hand soap?	Control	.18	29	.015**
	Green color	.18	39	.002**
	Green color + eco-label	.15	40	.022**
	Green phrases	.19	28	.008**
	Green phrases + eco-label	.21	40	.001***
	Symbols	.19	34	.002**
	Symbols + eco-label	.13	33	.148

Notes: [a] Lilliefors Significance Correction

Significance: *p<.05 **p<.01 ***p<.001

4.3 Sample description

Prior to hypotheses testing, the descriptive statistics are analyzed to examine the demographic information from the participants. The dataset collected a total of 398 responses. After cleaning the data, 243 participants were included for further analysis ($N = 243$). Hence the requirement to have at least 25 participants per condition is met. The sample shows that 23.0% of the participants were male ($N = 53$), 75.2% were female ($N = 173$), 0.9% were non-binary/ third gender ($N = 2$) and the remaining 0.9% preferred not to share their gender ($N = 2$).

The ages of the participants were ranging from 18 years old to 54 years old, with an average age of 25.98 (*SD* = 4.69*).* Moreover, when looking at the educational level of the participants, the most frequent educational level obtained is a master's degree (45.9%), followed by a bachelor's degree (42.9%), high school graduate (3.9%), some college degree/ MBO in Dutch (3.5%), Ph.D. or higher (3.0%), and least frequent is a degree lower than high school (0.4%) and others (0.4%) both with an even percentage.

4.4 Factor analysis on environmental concern

To confirm if factor analysis is allowed, a posteriori check was done. Therefore, three criteria must be met. First, more than one third of the correlation must be above .30. Second, the *KMO* = > .60 or above. Finally, Bartlett's test of Sphericity must be significant ($p < .05$). All criteria were met for the scales and therefore the factor analysis is accepted.

The 7 items which were Likert-scale based were entered into factor analysis using Principal Components extraction with Varimax rotation based on fixed number of factors (= 1.00), *KMO* = .84, χ^2 ($N = 231$, 21) = 1132.84, $p < .001$. The resultant model explained 61.6% of the variance in *environmental concern*. As a result, the scale measuring environmental concern ensured a Cronbach's alpha of .88 ($\alpha = .88$), which is larger than .70 ($\alpha = .70$) (Pallant, 2020). This proves that the measurement scale of *environmental concern* is internally consistent, which means it is reliable and accepted. The factor loadings of the seven items are presented in table 4.3.

Table 4.3. Factor loadings, explained variance and reliability of the factor found for the scale environmental concern ($N = 231$)

	Component
	1
I think environmental problems cannot be ignored.	.89
I think we should care about environmental problems.	.87
I think environmental problems are very important.	.85
Mankind is severely abusing the environment.	.81
Humans must live in harmony with nature in order to survive.	.73
When humans interfere with nature it often produces disastrous consequences.	.71
The balance of nature is very delicate and easily upset.	.58
R^2	.62
Cronbach's α	.88

4.5 Two samples t-test

To test the first four hypotheses for this study, four two-sample t-tests are conducted to analyze the statistically significant mean differences between the experimental conditions on purchasing intentions. The following paragraphs will present the results of the analysis.

4.5.1 The effect of eco-labels on consumer purchasing intention

The first analysis is conducted to examine if there is statistically significant difference in purchasing intention between PCPs on e-commerce platforms with eco-label and without eco-label. As discussed before in the previous chapter about data normalization, the normalized dependent variables '*sqrt_Likelihood*' and '*sqrt_WillingtoPay*' are used to measure purchasing intentions. First, a two-sample t-test was conducted to compare how likely the participants are to purchase PCPs with eco-label and PCPs without eco-label. The results shows that there is no significant difference found in PCPs with eco-label ($M = 5.25$, $SD = 2.74$) and PCPs without eco-label ($M = 5.58$, $SD = 2.73$); $t(241) = .95$, $p = .341$.

Second, another two-sample t-test was conducted to compare the mean of how much the participants are willing to pay between PCPs on e-commerce platforms with eco-label present and absent. There was no significant difference found in the product with eco-label present ($M = 2.14$, $SD = .44$) and the product with eco-label absent ($M = 2.19$, $SD = .44$); $t(241) = .90$, $p = .370$. As such it can be concluded that PCPs on e-commerce platforms with the presence of an eco-label does not lead to significant higher purchasing intentions compared to PCPs on e-commerce platforms without eco-label. Therefore, H1 is rejected ($\neq$ H1).

4.5.2 The effect of green color compared to eco-labels

To test if there is significant difference in purchasing intention between PCPs on e-commerce platforms using green as a visual attribute with eco-label, and PCPs on e-commerce platforms using green as visual attribute without eco-label, considered as greenwashing, again a two-sample t-test is conducted. First, the analysis is carried out with likelihood as dependent variable, and the two conditions: '*green color*' and '*green color + eco-label*' as independent variable. As such, there was no significant difference found in PCPs on e-commerce platforms using green colors with eco-label absent ($M = 5.58$, $SD = 2.49$) and PCPs using green colors on e-commerce platforms with eco-label present ($M = 4.58$, $SD = 2.63$); $t(77) = 1.73$, $p = .088$.

Secondly, an analysis is conducted with willingness to pay as dependent variable, and the same two conditions as independent variable. The t-test shows that there is no significant difference found in the purchasing intentions between PCPs on e-commerce platforms using green color as visual attribute with eco-label absent (M = 2.14, SD = .41) and PCPs on e-commerce platforms using green color as visual attribute with eco-label present (M = 2.09, SD = .47); t (77) = .52, p = .605. Therefore, it can be concluded that greenwashed PCPs, PCPs without eco-label, on e-commerce platforms using the color green as visual attribute does not lead to lower purchasing intentions compared to PCPs using green colors with eco-label present. Thus, H2 is rejected ($\neq$ H2).

4.5.3 The effect of green phrases compared to eco-labels

The third analysis using a sample t-test assesses the significant mean differences in purchasing intention between PCPs on e-commerce platforms using phrases related to green products with eco-label, and PCPs using green phrases without eco-label. The first analysis is conducted on *'sqrt_Likelihood'* as dependent variable, with '*Green phrases'* and '*Green phrases + eco-label'* as independent variable. The two-sample t-test presents that there is no significant difference found between PCPs using green phrases with eco-label (M = 5.74, SD = 2.84) and PCPs using green phrases without eco-label (M = 5.84, SD = 2.78); t (66) = .14, p = .886.

Following the fact that the two independent variables green phrases and green phrases with eco-label found no significant mean difference on likelihood, a further analysis was conducted to measure the purchasing intention with willingness to pay as dependent variable. The analysis demonstrates that there is no significant difference in how much participants are willing to pay between PCPs using green phrases with eco-label absent (M = 2.15, SD = .41) and PCPs using green phrases with eco-label present (M = 2.23, SD = .41); t (66) = -.79, p = .431. As a result, it can be concluded that greenwashed PCPs, PCPs using green phrases without eco-label, does not lead to a lower purchasing intention compared to PCPs with eco-label. Thus, H3 is rejected ($\neq$ H3).

4.5.4 The effect of symbolic images compared to eco-labels

To measure the significant mean difference between PCPs using nature associated symbolic images as visual attributes without eco-label, considered as greenwashing, and PCPs with eco-label, another two-sample t-test is conducted. The first analysis is performed on likelihood to measure the purchasing intention as dependent variable, with '*Symbols'* and

'*Symbols + eco-label'* as independent variable. The analysis showed that there is no significant difference found in purchasing intentions between the condition with symbolic images and eco-label absent ($M = 5.62$, $SD = 3.01$) and the condition with symbolic images and eco-label present ($M = 5.47$, $SD = 2.68$); $t(65) = .22$, $p = .825$.

As a follow up, an additional analysis is done to measure purchasing intention with willingness to pay as dependent variable. The results of the two-sample t-test indicates that there is no significant difference found in how much the participants are willing to pay between PCPs using nature-associated symbolic images with eco-label absent ($M = 2.29$, $SD = .53$) and PCPs using nature-associated symbolic images with eco-label present ($M = 2.09$, $SD = .45$); $t(65) = 1.65$, $p = .103$. Thus, it can be concluded that greenwashed PCPs, PCPs without eco-label using nature-associated symbolic images does not lead to a lower purchasing intention compared to PCPs with eco-labels ($\neq$ H4).

4.6 The moderating role of environmental concern

To test the final two hypotheses for this study, a moderation analysis is conducted to analyze the relative effectiveness of environmental concern as a moderator in the purchasing intentions of greenwashed and eco-labeled PCPs on e-commerce platforms. The following paragraphs will present the results of the analysis.

4.6.1 PCPs with eco-label on purchasing intention

The first analysis tests whether environmental concern as a moderator affects how likely the participants are to purchase eco-labeled PCPs (table 4.4). The moderation analysis is conducted using a linear regression with the condition eco-label coded as dummy variable (0= absent, 1= present), standardized variable of environmental concern, and eco-label multiplied with environmental concern to measure the interaction effect. Hence, the analysis is carried out with the three variables *'EcoLabelOrNot'*, *'ZEnvConc'* and *'EcoLxZEnvCon'* as independent variables, and *'sqrt_Likelihood'* as dependent variable.

The results shows that the model is not significant, $F (3, 227) = .96$, $p = .415$. Both, the presence of eco-label ($b* = -.06$, $t = -.97$, $p = .334$) and environmental concern ($b* = -.11$, $t = -.54$, $p = .592$) as predictor are found not to be significant. Simultaneously, the results shows that environmental concern has no significant moderation effect on the relationship between the presence of eco-label and purchasing intention ($b* = .19$, $t = .94$, $p = .346$).

Table 4.4. Regression model for likelihood to purchase eco-labeled products with environmental concern as moderator ($N = 243$)

	Unstandardized			
	B	*b**	*t*	*p*
Eco-label or not	-.35	-.06	-.97	.334
Environmental concern	-.30	-.11	-.54	.592
Eco-label*environmental concern	.34	.19	.94	.346
R^2	.012			
F	.96			

Notes: *sqrt_Likelihood* is used as dependent variable.

Significance levels: *$p< .05$ **$p< .01$ ***$p< .001$

The second analysis is conducted with willingness to pay as dependent variable to measure purchasing intention, and eco-label, environmental concern, interaction term eco-label and environmental concern as independent variable, as seen in table 4.5. The model is found to be not significant, $F(3, 227) = 1.50$, $p = .215$. The results demonstrates that the presence of eco-label ($b* = -.06$, $t = -.86$, $p = .388$) and environmental concern ($b* = -.02$, $t = -.09$, $p = .926$) have no significant effect on how much the participants are willing to spend on PCPs on e-commerce platforms. Additionally, the interaction shows that environmental concern does not have a significant moderating effect between the presence of eco-label and purchasing intention ($b* = .15$, $t = .74$, $p = .462$). Therefore, H5 is rejected ($\neq$ H5).

Table 4.5. Regression model for willingness to pay for eco-labeled products with environmental concern as moderator ($N = 243$)

	Unstandardized			
	B	*b**	*t*	*p*
Eco-label or not	-.05	-.06	-.86	.388
Environmental concern	-.01	-.02	-.09	.926
Eco-label*environmental concern	.04	.15	.74	.462
R^2	.019			
F	1.50			

Notes: *sqrt_WillingtoPay* is used as dependent variable

Significance levels: *$p< .05$ **$p< .01$ ***$p< .001$

4.6.2 Purchasing intention on greenwashed PCPs

In order to test whether environmental concern functions as a moderator in the effect of purchasing intention on greenwashed PCPs, a linear regression is conducted with 'greenwash or not' coded as dummy variable (0 = yes, 1 = no). Hence, the conditions two, four and six are coded with value 0 (= yes) and the remaining conditions are coded with value 1 (= no). As a result, greenwash or not, standardized environmental concern, and the interaction term of both variables are used as independent variable, and likelihood to measure purchasing intention as dependent variable for the first moderation analysis (see table 4.6). The model is found not to be significant $F (3, 227) = .73$, $p = .535$. The results shows that both independent variables; greenwashed ($b* = -.07$, $t = -.98$, p =.328) and the standardized variable environmental concern ($b* = -.02$, $t = -.07$, $p =.941$) are insignificant. Hence, the interaction effect similarly shows that environmental concern has no significant moderating role between greenwashing and purchasing intention ($b* = .09$, $t = .40$, $p =.691$).

Table 4.6. Regression model for likelihood to purchase greenwashed products with environmental concern as moderator ($N = 243$)

	Unstandardized			
	B	$b*$	t	p
Greenwash or not	-.36	-.07	-.98	.328
Environmental concern	-.05	-.02	-.07	.941
Greenwash*environmental concern	.15	.09	.40	.691
R^2	.010			
F	.73			

Notes: *sqrt_Likelihood* is used as dependent variable.

Significance levels: *$p< .05$ **$p< .01$ ***$p<. 001$

The second analysis is conducted on the variable measuring how much the participants are willing to pay as dependent variable. Hence, the same independent variables are used to test the moderating effect (see table 4.7). The model is found to be not significant, $F (3, 227) = 1.30$, $p = .276$. Furthermore, the outcome of the analysis demonstrates that individually greenwashing ($b* = -.03$, $t = -.43$, $p =.670$) and environmental concern ($b* = -.03$, $t = -.14$, $p =.890$) have no significant effect on the purchasing intention of PCPs on e-

commerce platforms. At the same time, it also appears that environmental concern has no moderating role between greenwashing and purchasing intentions *(b* = .16, t = .69, p =.490)*. As a result, H6 is rejected (≠ H6).

Table 4.7. Regression model for willingness to pay for greenwashed products with environmental concern as moderator ($N = 243$)

	Unstandardized			
	B	*b**	*t*	*p*
Greenwash or not	-.03	-.03	-.43	.670
Environmental concern	-.01	-.03	-.14	.890
Greenwash*environmental concern	.04	.16	.69	.490
R^2	.017			
F	1.30			

 Notes: *sqrt_WillingtoPay* is used as dependent variable

Significance levels: *p< .05 **p< .01 ***p< .001

4.7 Additional findings

An additional analysis is conducted, with the aim to have a better understanding of the visual attributes for green products in contrast to eco-labels on purchasing intentions.

4.7.1 The interaction effect between green visual attributes and eco-labels

For the additional analysis, a two-way between groups analysis of variance (ANOVA) is conducted to explore the impact of eco-labels and green visual attributes on the purchasing intentions measured by likelihood and willingness to pay. The conditions for the green visual attributes are divided into four groups (1 = none; 2 = color; 3 = phrases; 4 = symbols). There is no statistically significant main effect found for green visual attributes, F (3, 236) = .94, p = .422, partial η^2 = .01, and eco-label, F (1,236) = 1.21, p = .272, η^2 = .01 on likelihood. However, upon analyzing the interaction effect between eco-label and green visual attributes on the likelihood of purchasing PCPs on e-commerce platforms, there are some interesting findings that can be discussed. Firstly, the interaction plot in figure 4.1 shows that PCPs with eco-label and green color have lower purchasing intentions compared to PCPs without eco-labels and green color, which means the color green is considered as effective when greenwashed. Hence, PCPs with eco-label present result in a higher purchasing intention when green phrases are used compared to the attribute color and symbol.

Figure 4.1. Interaction plot eco-label and green visual attributes on likelihood (N = 243)

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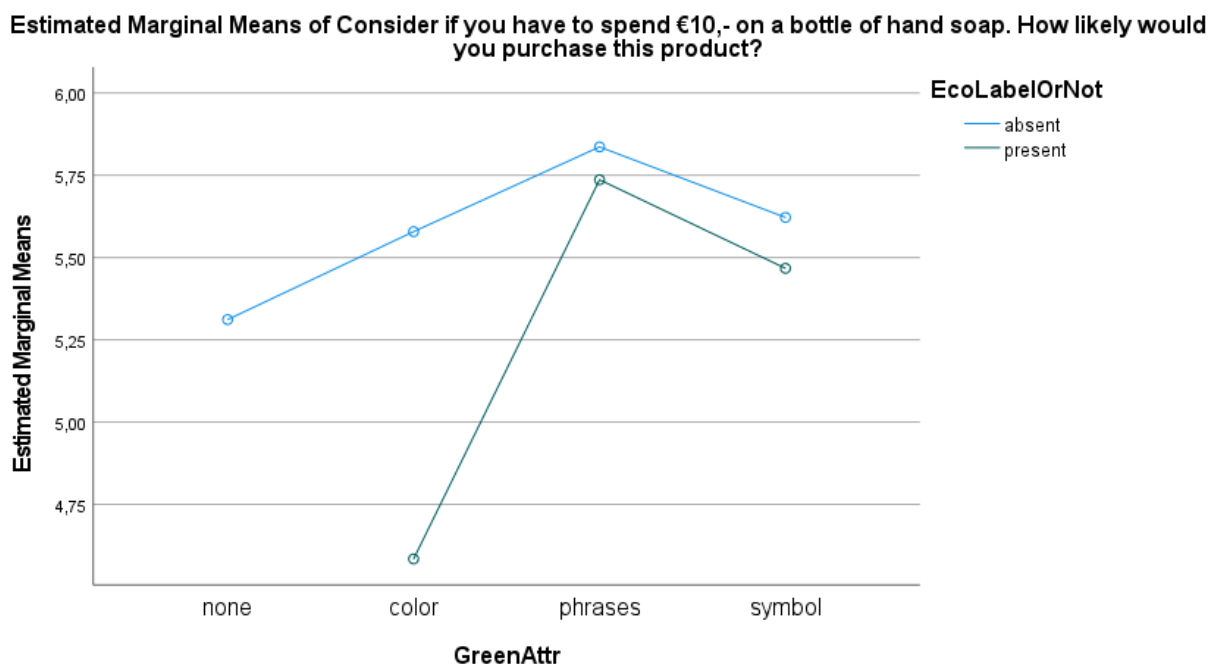
The second analysis conducted on willingness to pay similarly indicates that there is no significant main effect found for green visual attributes, $F (3, 236) = .49$, $p = .688$, $\eta^2 = .01$, and eco-label, $F (1,236) = .89$, $p = .346$, $\eta^2 = <.01$ on purchasing intention. However, the interaction plot highlights some interesting findings that are up for discussion. When looking at figure 4.2, it can be seen that the use of symbols is the most effective when eco-labels are absent as the marginal mean of willingness to pay is higher. Another distinctive finding derived from the interaction plot is when eco-labels are present, green phrases are the most effective attribute to highlight the green product compared to symbols and color. Hence, symbols and color are similarly low when eco-labels are present. Having the results of the analysis covered, the next chapter will dive more into the discussion and conclusion of this research.

Figure 4.2. Interaction plot eco-label and green visual attributes on willingness to pay ($N = 243$)
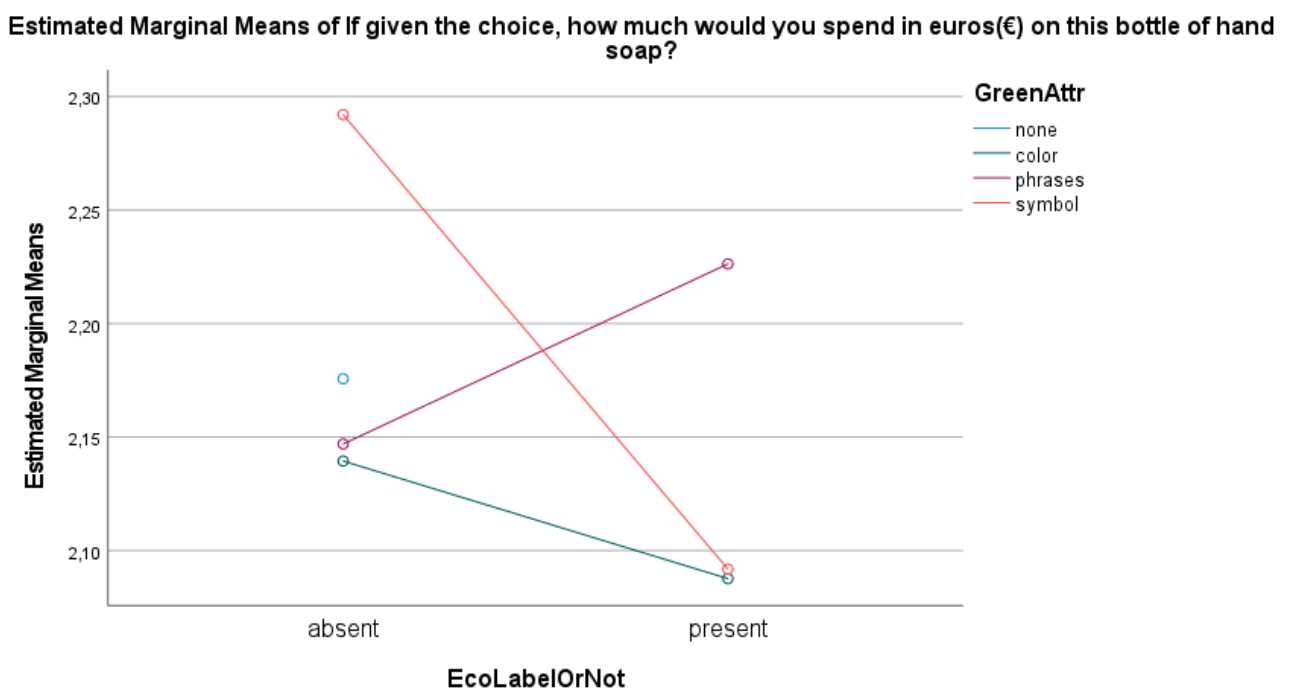
5. Conclusion and discussion

The aim of this study was to examine the effect of eco-labels in contrast to greenwashing with green visual attributes on the purchasing intentions of consumers in the Netherlands. In addition, this study also looked into whether environmental concern has a moderating role. In order to answer the research question, an online experiment was conducted, to test the effectiveness of eco-labels and green visual attributes – green color, green phrases and symbolic images – on purchasing intentions. Hence, hypotheses were formulated and tested, which brings us to the conclusion and discussion for this study.

Consumers are found to be strongly influenced by trusted third parties, hence that the addition of eco-labels on e-commerce platforms for PCPs should encourage purchasing intentions of consumers (Ottman, 2011). However, based on the results of this study, it can be concluded that consumers in the Netherlands are not influenced by eco-labels on e-commerce platforms selling PCPs, and that there is no difference in the purchasing intentions between PCPs that has an eco-label, and PCPs that do not have an eco-label. In addition, eco-labels are considered to be effective tools in green marketing to help businesses fight greenwashed product (Mukonza et al., 2021). Consequently, excessive use of green visual attributes without eco-labels can appear misleading according to the study of Jog and Singhal (2019). The findings suggest that greenwashing with the use of green visual attributes – green color, green phrases and symbolic images – does not change the intentions of consumers in the Netherlands to purchase PCPs on e-commerce platforms. Thus, it can be concluded that whether PCPs are greenwashed with green visual attributes, or not and authorized as genuine green product through eco-labels, it does not show any differences in the purchasing intentions.

Accordingly, the last hypotheses were tested on the moderating effect of environmental concern on purchasing intentions of greenwashed PCPs or PCPs with eco-label, following the theory of Nabilla (2019) that consumers with high environmental concern are particularly sensitive to the authenticity of green products. Based on the results of the analysis, it can be concluded that environmental concern does not moderate the effect of eco-labels or greenwashing with green visual attributes, on the purchasing intentions of consumers in the Netherlands. Moreover, it can be assumed that consumers with high or low environmental concern, both do not pay attention to the authenticity of green products as there is no difference between authorized green PCPs or greenwashed PCPs on e-commerce platforms. In summary, the result of this study implies that consumers in the Netherlands are

not particularly sensitive to authorized green PCPs with eco-label or greenwashed PCPs with green visual attributes. Hence, when analyzing the outcomes of the experiment, there was no significant differences found. Nonetheless, there are some theoretical implications of the outcomes that are up for discussion, which will be further discussed in the next section.

5.1 Theoretical implications

As outlined in this paper, the main theories used for this study were primarily focused on eco-labeling, greenwashing, green visual attributes, and environmental concern. Moreover, the results suggested that the outcomes of the analysis did not go in line with the literature discussed in chapter two, which is why the theory in the context of this study is up for discussion.

As Mukonza et al. (2021) argued in their study, the use of eco-labels helps businesses to counter greenwashing and proves the legitimacy of green products. Consequently, businesses will be strictly evaluated in order to earn an authorized eco-label, which is why eco-labeled products are proved to have higher purchasing intentions compared to greenwashed products (Mukonza et al., 2021). In Europe, there is only one eco-label provided for non-food products which is supported by the EU member states. This is the EU Eco-label (European Commission, 2021). Since Europe only has one eco-label compared to other countries, it was assumed that consumers in the Netherlands will recognize this label as a tool to authorize green products. Hence, this variable might be overlooked, as it is up for discussion whether consumers in the Netherlands recognize the EU eco-label or not. This occurrence might also explain why there is no difference between the purchasing intention on eco-labeled PCPs and greenwashed PCPs.

Moreover, this study contributed to a better understanding of the use of eco-labels in contrast to greenwashing with green visual attributes on e-commerce platforms, with an extended model focusing on consumers in the Netherlands specifically. Despite the absence of significant difference in the purchasing intention of eco-labeled or greenwashed PCPs, it is possible to assume that greenwashing might be as effective as eco-labels, which does not go in line with the study of many scholars (Mukonza et al., 2021; Fouziya & Gracious, 2018; Ottman, 2011) However, this might be the result of different cultural values, as in the context of this study, consumers in the Netherlands might have lower awareness regarding the purchase of green products which needs further research to reconcile these differences (Sreen et al., 2018).

Finally, despite that scholars have been arguing that environmental concern influences the perceptions and purchasing intentions of green products by consumers (Bulut et al., 2021; Matthes et al., 2014; Nabilla, 2019; Rusyani et al., 2021), environmental concern was not found to have a direct effect on the purchasing intention in this study. As acknowledged by Jaiswal and Kant (2018), environmental concern refers to the individual's awareness of environmental issues and their willingness to address them. As such, it is important to realize that awareness and willingness are two different stages, with awareness drawing upon the realization of something happening, and willingness the readiness to do something. For example, an individual can be aware of the environmental problems, but is not willing to take action for it, which might explain why environmental concern did not have its intended effect in this study.

5.2 Practical and managerial implications

In recent years, businesses are found to be more interested in green marketing strategies in contrast to greenwashing when it comes to the shopping behavior of consumers. The findings of this study provided profound results regarding the effectiveness of eco-labeling on consumers purchasing intentions on e-commerce platforms in contrast to greenwashing practices using green visual attributes in the personal care industry. Hence, that these results might provide insight and value for businesses, communication specialists, marketeers or any stakeholder that is interested in green marketing of PCPs on e-commerce platforms.

As previously discussed in this paper, the increasing environmental concern has led to many consumers to become more aware of green products and the importance of it. In response, businesses are found to be concentrating on green marketing strategies. However, the increasing ask for green products also led to competitors to greenwash products, which is why specific green marketing tools should be used, such as eco-labels, to indicate the authenticity of the green product (Sedky & AbdelRaheem, 2021). Moreover, this study has provided preliminary indications of the effectiveness of eco-labels in combination with green visual attributes to strengthen the authenticity of green products. While eco-labels might be considered as effective green marketing tools to prevent greenwashing (Mukonza et al., 2021), this study found no evidence in the market of consumers in the Netherlands. However, these findings can be of value for marketers in the personal care industry, as it points out that eco-label alone is not reliable enough to convince consumers in the Netherlands to purchase

the product. This observation can enable strategic opportunities for e-commerce platforms selling PCPs, to incorporate other green marketing tools such as eco-branding and environmental advertising to strengthen the effect and drive consumers' purchasing intentions (Chin et al., 2018).

Finally, it is valuable for businesses and stakeholders in the e-commerce or personal care industry to realize the vital role of information provision. As Delmans and Gergaud (2021) addressed, consumers need to be provided with the right information to confirm the greenness of the product, which at the end stimulates their purchasing intentions. Thus, in the context of e-commerce platforms, information that is relevant and authentic to the products' earth should be clearly communicated on the e-commerce platform or product page.

5.3 Limitations and future research

Along with this quantitative experimental study, a few limitations should be addressed to evaluate the process of this research. Moreover, the limitations are not to criticize the quality of this study but should serve as a stepping stone for future research recommendations. As Neuman (2011, p. 283) already mentioned, there are numerous practical and ethical restrictions to experimental studies. With experiments, we mostly focus on aspects that are relevant for the study and manipulate those to examine the results. However, these manipulations are limited, as we cannot control all aspects of life to gain scientific understanding (Neuman, 2011, p. 283). This study provided some interesting aspects for future research to look at. First and foremost, drawing upon the visuals designed for the experimental conditions, this study focused on placing eco-labels and green visual attributes on e-commerce platforms as the main purpose of this study. However, when it comes to green marketing and greenwashing of products, product packaging is also considered a significant determinant, which might be a possible variable that has impacted the experimental results (Pan et al., 2021; Moorthy et al., 2021). Therefore, future researchers can use this study as a base and implement green product packaging, which is displayed as product image on e-commerce platforms, in addition to product description to examine if green packaging had an influence on the significance of this study.

The second limitation relates to the research sample. As the sampling for this study is focused on consumers in the Netherlands, future research can consider detailed sociodemographic factors in this population that might affect the purchasing intentions of green PCPs. For instance, Sreen et al. (2018), found in their study that female consumers are

more influenced by society when making purchasing decisions. Consequently, different cultures have different values and motivations, for example in some cultures, mostly women are in charge of purchasing home supplies, which might be a factor that influences the attitude towards PCPs (Sreen et al., 2018). Therefore, future studies can draw upon specific sociodemographic factors, for example, cultural groups in the Netherlands or gender, to examine if these factors have a moderating role between eco-labeled or greenwashed PCPs, and purchasing intentions.

Additionally, Delmas and Gergaud (2021) mentioned that consumers might not be aware of the purpose of eco-labels, as in other countries eco-labels are issued by various third parties, while in the Netherlands only the EU-eco-label is recognized as authorized label for non-food products. Thus, it was assumed that consumers in the Netherlands recognize the purpose of the EU-eco-label. However, as the results of this study found no significance, it can be argued if consumers in the Netherlands are truly aware of the purpose of EU eco-label, which might be an important variable to look at for future studies.

Finally, as Babbie (2014, p. 50) discussed, quantitative studies take deductive approaches which searches for correlations and relations between variables, while qualitative studies take inductive approaches to find patterns and meanings behind what is observed. Thus, the limitation that comes with this quantitative study is that underlying motivations of the purchasing intentions from participants cannot be retrieved. Hence, that this study concluded that environmental concern has no moderating effect on the purchasing intentions on eco-labeled or greenwashed PCPs. Consequently, Jaiswal and Kant (2018) argued that environmental concern refers to the individual's awareness of environmental issues and their willingness to change their behaviors. The results of this study showed that the level of environmental concern did not affect the purchasing intentions on eco-labeled or greenwashed PCPs, thus it can be assumed that even with high environmental concern, consumers were not willing to change their attitude towards green PCPs. As a result, future research can draw upon these findings, and carry out a qualitative study to gain a better understanding of environmental awareness compared to the intrinsic motivations of consumers in the Netherlands to purchase green PCPs.

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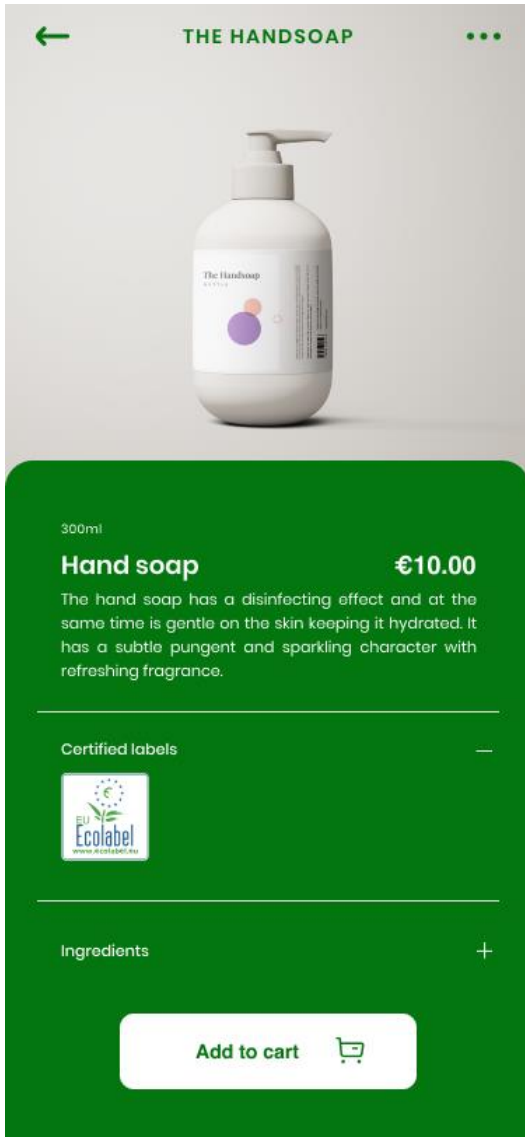
Appendix A – Experimental conditions version 1 pre-test

(0) Control group

(1) Green color

(2) Green color + eco-label

(3) Green phrases

(4) Green phrases + eco-label

(5) Symbolic images

(6) Symbolic images + eco-label

THE HANDSOAP

Home   Beauty   **Personal Care**   Health   Contact

Home / Personal Care / Handsoaps

🍃 PRODUCT

Handsoap

€2,50

Quantity

⊖ 1 ⊕

ADD TO CART

Certified labels

EU Ecolabel
www.ecolabel.eu

Description

The *eco-friendly* hand wash gently cleanses and keeps skin hydrated. The scent of Hand & Body Wash from The Handsoap has a subtle pungent and sparkling character. With fragrance notes of green tea, citrus accords and sage.

Appendix B – Experimental conditions version 2 final

(0) Control group
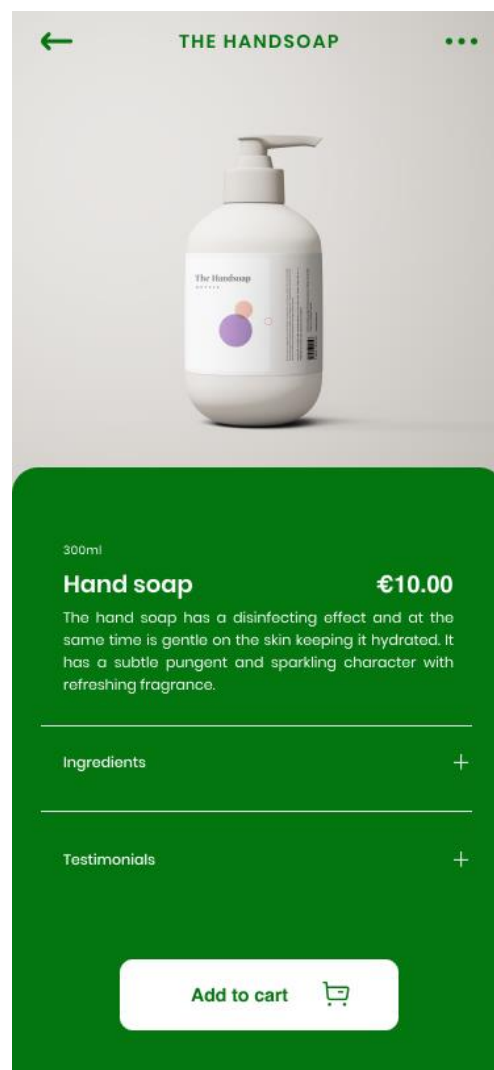
(1) Green color

(2) Green color + eco-label   (3) Green phrases

(4) Green phrases + eco-label

(5) Symbolic images

(6) Symbolic images + eco-label

Appendix C – Online survey

Dear participant,

Thank you for taking the time to participate in this study. My name is Tommy Chiu and I am currently writing my thesis for my Master's Media and Business at the Erasmus University Rotterdam. The purpose of this study is to gain insight in your purchasing intentions on Personal Care Products. Filling out this survey will roughly take 3-5 minutes. The information gathered will remain confidential and entirely anonymous. Therefore, the data will not be shared with third parties and solely used for this thesis study.

To participate in this study, you are 18 years or older. Your participation is completely voluntary, there are no correct or incorrect answers. Please take your time to honestly answer each question. If you have any questions regarding this study, please feel free to e-mail 579608cc@eur.nl

 By clicking on "I agree" you confirm that you have read and understood the information stated above, and that you consent to take part in the study. When you no longer wish to participate, please close this window.

◯ I agree

Are you currently living in the Netherlands?

◯ Yes

◯ No

Skip To: End of Survey If Are you currently living in the Netherlands? = No

---

Start of Block: (0) Control: No stimuli
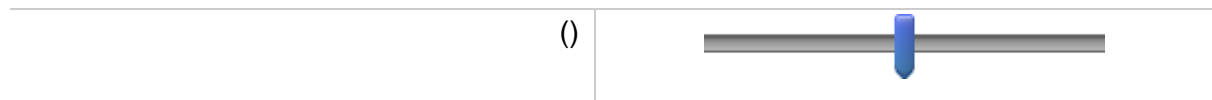
Please take 1 minute to carefully look at the product information on this page.

Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?

	Very unlikely	Very likely
()		

✳

If given the choice, how much would you spend in euros (€) on this bottle of hand soap?

_____

Did the product page contain this certified eco-label? (See image below)

○ Yes

○ No

○ I don't know

Please take 1 minute to carefully look at the product information on this page.

Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?

	Very unlikely	Very likely
()		

---

[*]

If given the choice, how much would you spend in (€) euros on this bottle of hand soap?

_____

Did the product page contain this certified eco-label? (See image below)

○ Yes

○ No

○ I don't know

Was the product page dominated by the color green?

○ Yes

○ No

○ I don't know

Please take 1 minute to carefully look at the product information on this page.

Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?

	Very unlikely	Very likely
()		

*

If given the choice, how much would you spend in (€) euros on this bottle of hand soap?

_____

Did the product page contain this certified eco-label? (See image below)

○ Yes

○ No

○ I don't know

Was the product page dominated by the color green?

○ Yes

○ No

○ I don't know

Please take 1 minute to carefully look at the product information on this page.

Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?

	Very unlikely	Very likely
()		

---

*

If given the choice, how much would you spend in (€) euros on this bottle of hand soap?

_____

Did the product page contain this certified eco-label? (See image below)

○ Yes

○ No

○ I don't know

Did the product page contain any words related to green products? (e.g., organic, natural, sustainable, eco-friendly etc.)

○ Yes

○ No

○ I don't know
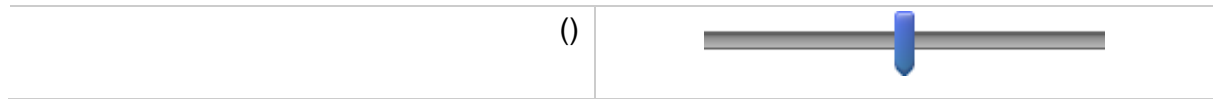
End of Block: Written phrase (3)

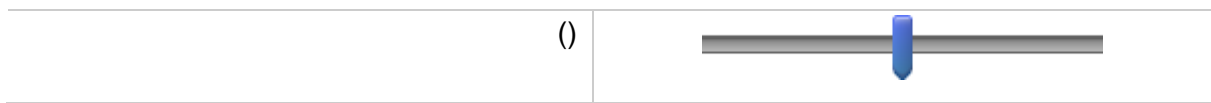**Start of Block: Written phrase + eco-label (4)**

Please take 1 minute to carefully look at the product information on this page.

Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?

	Very unlikely	Very likely
()		

---

*

If given the choice, how much would you spend in (€) euros on this bottle of hand soap?

_____

Did the product page contain this certified eco-label? (See image below)

○ Yes

○ No

○ I don't know

Did the product page contain any words related to green products? (e.g., organic, natural, sustainable, eco-friendly etc.)

○ Yes

○ No

○ I don't know

Please take 1 minute to carefully look at the product information on this page.

Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?

	Very unlikely	Very likely
()		

✳

If given the choice, how much would you spend in (€) euros on this bottle of hand soap?

_____

Did the product page contain this certified eco-label? (See image below)

◯ Yes

◯ No

◯ I don't know

Did the product page contain any symbolic images related to green products? (e.g., leaves, recycling, globe etc.)

○ Yes

○ No

○ I don't know

Please take 1 minute to carefully look at the product information on this page.

Consider if you have to spend €10, - on a bottle of hand soap. How likely would you purchase this product?

	Very unlikely	Very likely
()		

✳

If given the choice, how much would you spend in (€) euros on this bottle of hand soap?

_____

Did the product page contain this certified eco-label? (see image below)

○ Yes

○ No

○ I don't know

Did the product page contain any symbolic images related to green products? (e.g. leaves, recycling, globe etc.)

○ Yes

○ No

○ I don't know

Please read the following statements regarding environmental concern carefully. Indicate to what extent you agree or disagree with the statement.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Mankind is severely abusing the environment	○	○	○	○	○	○	○
When humans interfere with nature it often produces disastrous consequences.	○	○	○	○	○	○	○
The balance of nature is very delicate and easily upset.	○	○	○	○	○	○	○
Humans must live in harmony with nature in order to survive.	○	○	○	○	○	○	○
I think environmental problems are very important.	○	○	○	○	○	○	○
I think environmental problems cannot be ignored.	○	○	○	○	○	○	○
I think we should care about environmental problems.	○	○	○	○	○	○	○

End of Block: Environmental concern

Start of Block: Demographics

Almost done! Here are a few final questions.

What is your gender?

○ Male

○ Female

○ Non-binary / third gender

○ Prefer not to say

---

*

What is your age? (In numbers)

_____

What is the highest degree or level of education you have completed? (If currently enrolled, please choose the prospective degree)

○ Some high school or less

○ High school graduate

○ Some college/ MBO (in Dutch)

○ Bachelor's degree

○ Master's degree

○ Ph.D. or higher

○ Other, namely: _____

End of Block: Demographics

Appendix D – Normality test on logLikelihood and logWillingtoPay

	Condition	Kolmogorov-Smirnov[a]		
		Statistic	df	Sig.
logLikelihood	Control	.15	29	.092
	Green color	.18	39	.004**
	Green color + eco-label	.13	40	.120
	Green phrases	.21	28	.004**
	Green phrases + eco-label	.14	40	.046*
	Symbols	.16	34	.038*
	Symbols + eco-label	.25	33	.001***
logWillingtoPay	Control	.22	29	.001***
	Green color	.22	39	.001***
	Green color + eco-label	.18	40	.003**
	Green phrases	.22	28	.001***
	Green phrases + eco-label	.25	40	.001***
	Symbols	.24	34	.001***
	Symbols + eco-label	.16	33	.032*

Notes: Lilliefors Significance Correction

Significance: *p<.05 **p<.01 ***p<.001