



Natural claims and sustainability: The role of perceived efficacy and sensorial expectations

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ABSTRACT

Natural claims have been increasingly used by brands across a variety of product categories to address the growing concerns about sustainable and healthy consumption. To add insights to this body of knowledge, this research aims to investigate the influence of natural claims on consumers' judgments and purchase intentions of personal care products. Findings from two studies suggest that natural claims are broadly used in personal care product packaging to influence consumers' purchase intentions, due to the natural-is-better bias and the health halos evoked by such claims. This research also contributes to the literature by investigating the underlying mechanisms of perceived efficacy, safety, sensorial expectations, and greenwashing perceptions. Moreover, environmental consciousness moderates the effects of natural claims on consumers' judgments of perceived efficacy. The findings thus not only enhance our understanding of the natural-is-better bias but also shed light on the role played by perceived safety and sensorial expectations on intentions to purchase natural-claimed products. Relevant implications for brands and policymakers in terms of sustainable consumption are also discussed.

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1. Introduction

Consumers are changing their shopping habits as they are becoming more mindful of natural and environmentally-friendly products (Thurmer et al., 2022; Nielsen, 2019). According to the Euromonitor International (Culliney, 2020), “naturalness” was the top claim for beauty and personal care products out of 1500 retailers. The growing demand for natural-claimed offers in personal care has also been reflected in sales: for instance, only in Europe, has the market for natural products had an annual growth of about 7.2 % in recent years (Gallon, 2019). Therefore, manufacturers and governments have incentivized the use of sustainable and natural claims in all sorts of products to foster sustainable consumption and production practices (Kolling et al., 2022; Musicus et al., 2022; Mungkung et al., 2021).

Recent research indicates that natural and sustainable product attributes influence sensory expectations, brand reputation, and consumer behavior (Nunes and Park, 2017; Marcon et al., 2022; Román et al., 2017). However, extant research provides mixed insights regarding

natural claims: while some authors suggest that consumers may perceive natural products as less efficient (Scott et al., 2020), other authors indicate that natural claims often increase perceived quality due to halo effects (Li and Cao, 2020). Hence, we intend to further understand how the natural claims displayed on the packaging influence the perceived efficacy, the perception of safety, the sensorial expectations, and the intentions to purchase natural personal care goods.

Despite the importance of consumers' bias towards natural products (Meier et al., 2019a), the literature still does not provide a clear picture of natural claims effects, presenting instead some inconsistent results. On the one hand, prior evidence suggests that environmentally concerned consumers tend to be more biased regarding natural claims, influencing their perceptions and shopping behavior (Kim and Seock, 2009; Li and Cao, 2020). Yet, studies have found that environmentally conscious consumers tend to engage in more information-seeking actions when shopping for products, and thus are less influenced by product claims (Lin and Chang, 2012). Thus, further research is needed to investigate the influence of natural claims on consumers' judgments and purchase intentions of personal care products. As a result, a set of research questions arise: Firstly, how can natural claims influence consumers' perceptions and sustainable shopping behaviors? Secondly, how do individual differences affect the halos and biases elicited by natural claims?

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This research aims to fill this gap in the literature by deepening the understanding of how individual differences (such as health and environmental consciousness) can shape the natural-is-better bias and the health halos evoked by natural claims. This natural-is-better bias happens when natural claims affect consumers' judgments of other product attributes (Berry et al., 2017), driving consumers towards more sustainable consumption. In other words, consumers tend to prefer natural goods because they are perceived as better for consumers' health (Meier et al., 2019a; Meier et al., 2019b), as well as being more environmentally friendly (Thurmer et al., 2022). We thus propose that natural claims may affect consumers' attribute inferences, and, ultimately, purchase intentions (Berry et al., 2017; Ghazali et al., 2017). However, to the best of the authors' knowledge, the literature does not offer clear guidelines on natural claims effects in the personal care sector. Therefore, this study aims to provide a deeper understanding of the impact of natural claims on consumers' judgments and shopping behavior.

By doing so, the current research makes at least three contributions to the literature. Firstly, this research adds to the body of knowledge by extending our understanding of the natural-is-better bias in product packaging and natural claims in the food and beverage industry (Berry et al., 2017; Román et al., 2017). Secondly, it allows us to conclude how individual differences may impact consumers' reactions to products with natural claims (Kim and Seock, 2009). Thirdly, it adds to recent research about the consumption of natural personal care products that have been focused on barriers to consumption (Sadiq et al., 2021), risk perceptions, and brand trust (Kumar et al., 2021) or claims of credibility, health, and environmental concerns (Grappe et al., 2022), by exploring other explanatory mechanisms of purchase intentions such as perceived efficacy, safety, sensorial expectations, and greenwashing perceptions.

From a practical standpoint, this research provides helpful insights to brands and marketers, by recognizing that natural claims can add value to their products, and how to leverage such claims, which contributes to a more sustainable strategy. It also sheds some light on the discussion about greenwashing perceptions and consumer mistrust. Finally, it brings new knowledge to the personal care sector and policymakers, by assessing how the health halos elicited by these claims are influenced by health and environmental consciousness, to create better legislation and fair competition between brands.

2. Literature Review and Hypothesis Development

2.1. Natural Claims on Products Packaging

Consumers use packaging, an extrinsic cue, to infer intrinsic product attributes (Underwood and Klein, 2002). Besides communicating product qualities, it can also influence consumers' expectations (Sundar et al., 2020; Musicus et al., 2022). Packaging is generally divided according to two different categories: visual elements and informational elements. Visual elements refer not only to graphic aspects such as layout, colors, typography, and imagery but also to sizes and shapes. Informational elements refer to packaging information such as product, brand, packaging technology, and product information. Images, text information, and design elements are crucial not only to capture one's attention but also to help consumers gather more information on the items and compare options (Sundar et al., 2020). Even knowing that the process of visual cues may be related to unconscious mechanisms, whereas verbal cues require a higher level of cognitive effort, it is important to understand that different sources of information influence human perception in a systemic manner (Underwood and Klein, 2002). Moreover, the visual aspects (e.g., color, text, graphic design) that are part of the packaging stimuli have different impacts on consumers' perceptions of health, environment, and sensory attributes of a product (Schifferstein et al., 2022).

Consumers are exposed to several products every time they go shopping, and as such, they rely on product claims as cues to simplify their

daily choices and to make inferences about a product's attributes (Rybak et al., 2021; Schifferstein et al., 2022). Product claims, an informational element of product packaging, are therefore highly important attributes that positively influences its credibility and decreases the perceptions of manipulative intent (Fajardo and Townsend, 2016).

Claims are any representation or message, which is not mandatory under the legislation. A study from Cousté et al. (2012) identified four types of packaging claims: (1) environmental (e.g., "reusable", "safe for the environment"), (2) nutritional positive attributes (e.g., "high in antioxidants", "high in vitamins"), (3) nutritional negative attributes (e.g., "no alcohol", "low fat") and (4) production claims (e.g., "natural", "no chemicals"). These claims can be developed by third parties, especially in the case of environmental claims or by the brands themselves (self-declared claims) (Nunes and Park, 2017).

Sustainable and natural claims have become one of the leading claims on new products introduced worldwide in the personal care market (Culliney, 2020; Gallon, 2019). One of the reasons for this phenomenon is an idealone one. People are influenced by the "natural-is-better bias" where consumers think of a natural entity as more sustainable and intrinsically better than a non-natural entity (Meier et al., 2019b).

The second explanation for this natural preference involves the specific advantages that consumers associate with natural claims. These perceptions can be influenced by halo effects enticed by natural claimed products (Apaolaza et al., 2014; Berry et al., 2017) and lay theories consumers hold (Luchs et al., 2010). Halo effects are defined as the consumers' use of limited information regarding a product characteristic to infer other product attributes, biasing consumers' assumptions (Apaolaza et al., 2017; Ikonen et al., 2020). On the other hand, lay theories are core beliefs people hold to help making sense of the world (Roy and Naidoo, 2021). The later effects are distinct, since halo effects are fallacies caused by inferences and lay theories are mainly popular beliefs of certain cultures, but they are both heuristics that individuals use to simplify their decisions and judgments formation (Hoek et al., 2013).

Despite the acknowledged positive effects of sustainable and natural claims on consumers' perceptions and shopping behavior (Berry et al., 2017), little conclusive research has been conducted in this area, as most papers have focused only on the food and medicine fields. Table 1 summarizes previous literature about natural claims used in packaging and their impact on consumer perceptions and behavior (we did not consider literature focused on medical aspects or vice goods).

Table 1 indicates that consumers associate natural claims as safer (Amos et al., 2014), healthier (André et al., 2019; Rybak et al., 2021), and more environmentally friendly products (Hoek et al., 2013). The opposite is also true when we consider negative halo effects associated with "unnatural claims" (Sundar et al., 2020). Despite the semantic differences between these terms, there is a cognitive overlap when consumers use the words "sustainable", "natural", "healthy", and "ethical" when making food choices (Schiano et al., 2020). Hence, consumers may associate a "natural" claim with a more ethical, sustainable, or healthy purchase, even when that is not the case. Besides this overlap, some variables can be influenced by the perception one has about a product that claims to be natural, such as perceived efficacy, perceived safety, and sensorial expectations, which will be discussed next.

2.2. Perceived Efficacy

Perceived efficacy is the product's ability to deliver its benefits (Vanbergen et al., 2020). The perception of efficacy is generally based on expectations held by consumers regarding the product and its ingredients (Sundar et al., 2020). However, personal care products sometimes pledge to achieve something nearly impossible for individuals (e.g., miracle hair moisturizing treatment). Thus, consumers may rely on cues to form efficacy beliefs (Sundar et al., 2020), using such heuristics to aid and simplify the decision-making process (Hoek et al., 2013).

Table 1
Literature regarding natural claims on products' packaging and its impact on consumer perceptions and behaviors.

| Source | Product category | Type of claims | Key findings |
|------------------------------|-----------------------------|--|---|
| Lunardo and Saintives (2013) | Food | Naturland (independent claim) 100 % Natural (brand claim) | Natural claims lead consumers to perceive products as more natural, depending on the point-of-purchase, the salience of the claims and authority which claims the naturalness. |
| Hoek et al. (2013) | Household cleaning products | Eco-friendly Natural ingredients No animal testing | Consumers respond more positively to general rather than specific claims. Even though they have a significant influence on consumers' choice behavior, they may be skeptical of ethical and sustainable claims. |
| Apaolaza et al. (2014) | Fragrances | Perfumes made of 100 % natural ingredients | Natural claims influence hedonic sensory perception, acceptance, and purchase intention. |
| Amos et al. (2014) | Food and supplements | All natural | Natural claims evoke positive feelings and a pastoral view of nature, which in turn influences positive instrumental beliefs such as product safety and health advantages. |
| Berry et al. (2017) | Food | All natural | Natural claims influence consumers' attribute inferences, which in turn influence product evaluations. |
| Skubisz (2017) | Food and beverage | 100 % Natural All natural | Natural labeled products are evaluated as healthier and with fewer calories than non-natural items. |
| André et al. (2019) | Food | Natural and science-based claim | Claim type influences inferences about taste, healthiness, and dieting. Natural claimed products are perceived as healthier and less tasty than items with claims based on science. |
| Rybak et al. (2021) | Food | Processing and nutrient claim | Processing claims and ingredient list influence purchase intentions through mediator clean labels. Clean labels positively influence "healthy" perceptions. |
| Sundar et al. (2020) | Food | Unnatural claim | Unnatural nutritional claims on food labels induce negative health halo effects such as higher calorie estimation |
| Musicus et al. (2022) | Food | Nutrients and natural claims | Most fruit drinks and 100 % of juice packages aimed at kids in the US contain nutrient claims that may be misleading to shoppers. |

According to prior research, perceived efficacy can be elicited by price information (Shiv et al., 2005), product packaging claims (Ikonen et al., 2020), and lay theories regarding side effects (Kramer et al., 2012). Previous studies have concluded that consumers hold lay theories about natural products (i.e., are perceived to have lower side effects), consumers may also associate them with ineffectiveness (Lin and Chang, 2012; Meier et al., 2019b; Scott et al., 2020). In this sense, natural claims may be associated with a risk barrier to consumption where individuals question the functionality of the product, which in turn could influence intentions to use products that present such attributes (Kushwah et al., 2019). Therefore, in line with this rationale, we suggest the following hypothesis:

H1a. Natural claims will negatively influence consumers' perceived efficacy judgments.

2.3. Perceived Safety

Perceived safety refers to the level to which consumers believe that the use of a specific product will be harmless due to the lack of chemical and synthetic ingredients (Bauer et al., 2013). A significant number of individuals may perceive that products with natural claims do not contain man-made chemicals or harmful substances and therefore, perceive them as a safer option than non-natural products (Amos et al., 2019; Meier et al., 2019b).

Natural claims thus increase consumers' ratings of instrumental attributes, such as safety (e.g., food and supplements), and even reduce perceived risks (e.g., tobacco) (Amos et al., 2014; Davis and Burton, 2019; Meier et al., 2019b). Therefore, it is crucial to understand how natural claims influence consumers' safety judgment formation. Thus, we propose that:

H1b. Natural claims will positively influence consumers' perceived safety judgments.

2.4. Sensory Expectations

Sensory expectations are described as consumers' belief that a certain product will possess numerous sensory attributes (Apaolaza et al., 2017). For instance, when purchasing organic vegetables, consumers may expect them to have more vivid colors or to have a better taste

than non-organic products. Also, when customers are choosing between shampoo brands in the supermarket that offer a natural claim (e.g., the use of coconut oil), one might expect the shampoo to leave a pleasant natural aroma. Sensory expectations are key for consumers when selecting personal care products, therefore, during the decision-making process, consumers create expectations of what they would experience (Togawa et al., 2019).

Previous literature has focused on the effects of claims on consumers' sensorial expectations. When consumers were exposed to a natural or organic ingredient claim in the food and wine markets, their hedonic sensory perceptions were higher than the ones who had not been exposed to that claim before the tasting (Apaolaza et al., 2017). This seems to represent an example of a halo effect, since natural entities are often thought to be more appealing to the senses than non-natural products (Rozin, 2005), influencing consumers' sensory perceptions and purchase decisions. However, to the best of our knowledge, little is known about the effect of claims on consumers' sensory expectations in non-food categories (for a notable exception see Apaolaza et al., 2014). Therefore, to address this research gap we suggest that:

H1c. Natural claims will positively influence consumers' sensory expectations.

2.5. Purchase Intentions

Previous research has been extensive about the plans or impulses a consumer has to purchase a product (Berry et al., 2017), suggesting that packaging claims influence consumers' purchase intentions (Apaolaza et al., 2017; Cousté et al., 2012). Much of the research done on this subject has been conducted in the food and medicine domains (Meier et al., 2019b), and has focused on health and nutrition-related claims (André et al., 2019; Ikonen et al., 2020). In personal care products, the research available is mostly related to organic products (Zollo et al., 2021). In the field of natural claims, since most papers suggest that consumers prefer products that are positioned as natural (Meier et al., 2019a; Scott et al., 2020), we expect this effect to hold in the personal care category.

Most consumers justify this preference by alleging that such products trigger positive feelings (Amos et al., 2014) and are perceived to be healthier (Hoek et al., 2017; Li and Cao, 2020; Skubisz, 2017). There is evidence that consumers' perceptions of safety and

effectiveness may mediate the relationship between natural claims and purchase intentions in the pharmaceutical category (Meier et al., 2019b; Scott et al., 2020). In other words, such claims seem to be associated to the potential hazard and the performance of a said product. Further research also shows that consumers tend to have higher sensory expectations for naturally claimed products, which also leads to higher purchase intentions (Apaolaza et al., 2017). Considering this rationale, and since multiple studies and reports have highlighted safety, efficacy, and sensorial experiences as key success factors in the personal care industry (Leggett, 2020; Nielsen, 2019), we propose the following:

H2. The positive effects of natural claims on consumers' purchase intentions are mediated by perceived efficacy (a), perceived safety (b), and sensory expectations (c).

2.6. Health Consciousness

Health consciousness is an individual trait that reflects the degree of concern of individuals with their health (Plank and Gould, 1990). Health-conscious consumers tend to actively monitor their health state and modify their behavior to influence their health (Kim and Seock, 2009), such as the purchase of organic products (Mai and Hoffmann, 2015).

An exploratory study conducted in the natural beauty products segment found that individuals higher in health consciousness did not just consider natural beauty products to be healthier, but also considered them to work better than conventional products, to be safer, more technologically advanced, and more fashionable than synthetic ones (Kim and Seock, 2009). Furthermore, Meier et al. (2019a) suggest that health consciousness may play a role in people's preferences for natural products, mainly due to safety reasons. Hence, we propose the following:

H3. Health consciousness moderates the effect of natural claims on perceived efficacy (a), perceived safety (b), and on sensorial expectations (c).

2.7. Environmental Consciousness

Environmental consciousness has previously been linked to more pro-environmental behavior and the purchase of green products (Barber et al., 2012; Sreen et al., 2021). Previous studies have confirmed that consumers who are more environmentally conscious are more susceptible to the natural-is-better bias (Li and Cao, 2020) and are more likely to undertake additional actions, such as information seeking, to make informed decisions (Testa et al., 2020). Concerns about the environment and a higher connectedness with nature influence the consumption of natural

products and increase the “natural is better” bias (Li and Cao, 2020; Sreen et al., 2021). The explanation lies in the perception that these products are not only generally better but also more sustainable.

In the present investigation, we are interested in assessing the influence of environmental consciousness on the halo effects leveraged by natural claims. Apaolaza et al. (2014) found no significant results of pro-environmentalism on the relationship between natural claims and consumers' perceptions regarding perfumes. Nonetheless, Kim and Seock (2009) results suggest that high levels of environmental consciousness increase the likelihood of individuals to infer greater quality differences between natural and synthetic products and deduce that such products are more effective and safer than conventional alternatives. To further understand the role played by environmental consciousness on personal care purchases we suggest that:

H4. Environmental consciousness moderates the effect of natural claims on perceived efficacy (a), perceived safety (b), and sensorial expectations.

Fig. 1 illustrates the conceptual model of this paper, summarizing the hypotheses to be addressed in this research.

3. Research Methods

The present section presents the results of our proposed framework, which was tested with a pilot and an experimental study performed with Portuguese customers. This market was chosen because by February 2022, Portugal had the third highest yearly increase in overall retail volume among EU members (16 % of increase compared to February 2021) (Eurostat, 2022). Moreover, in the Personal Care sector, which is the focus of this research, the revenue in 2022 accounts for € 1.58bn, and the market is expected to grow annually by 2.62 % in the next years (Statista, 2022). This implies a growing market; therefore, it is interesting to deepen our understanding of variables that influence the perceptions and behaviors of these customers.

In the pilot study, we used an exploratory method to understand which types of claims were the most used in the Portuguese personal care market, and the way they are presented to consumers to provide the variation used in Study 1. Study 1 used an experimental methodology to understand how natural claims (vs. control group with no claim) influenced the product's attributes (perceived efficacy, perceived safety, and sensorial expectations), the impact of these attributes on purchase intentions, and the influence of health and environmental consciousness on these relationships. The studies followed the imposed international and institutional procedures and were approved by the University's Ethics Committee.

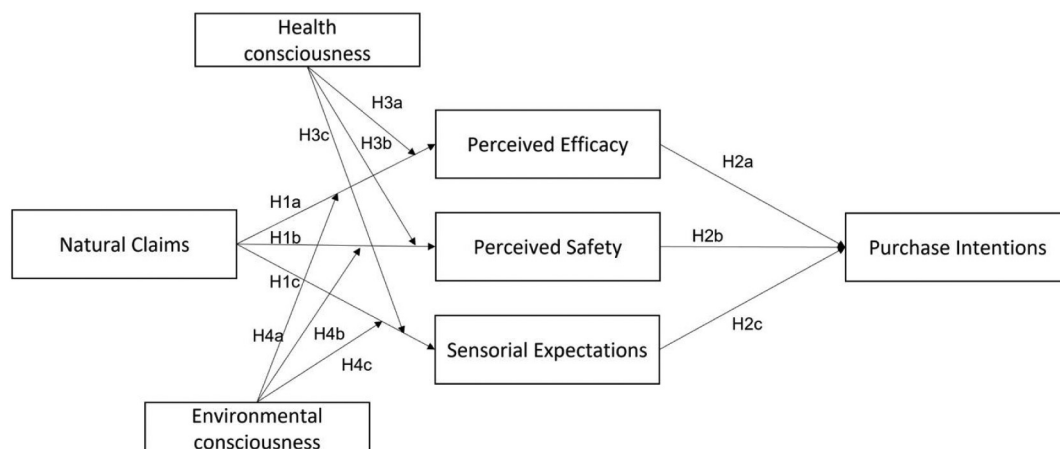


Fig. 1. Conceptual model.

3.1. Pilot Study

3.1.1. Procedures

An exploratory empirical study using content analysis was employed to examine natural claims and their different variations. This type of research is useful in the context of discovery to formulate new theories and has been previously employed in the study of packaging and claims (Chrysochou and Festila, 2019). To guarantee the excellence of this analysis, special attention was dedicated to improving the objectivity, sampling methods, systematization, and reliability of the study (Kolbe and Burnett, 1991). Systematization was attempted by following a data collection design that analyzed objective identifiable features of personal care products – natural claim type, level of naturalness, and type of visual presentation.

For two months an online content analysis was carried out using the websites of five large retail players in the Portuguese market (Continente, Pingo Doce, SuperCor, Auchan and E.Leclerc). For this study, and due to time and resource constraints, this analysis focused only on personal care products that presented front-of-package natural claims, to examine a relatively large number of packages that would not exceed the resources of this research, and to guarantee the quality of the sampling method. Similarly, the data source's choice was based on having a sufficient market share of personal care products, and for the sake of only considering claims that are salient in mass-market retailers (specialized shops were deliberately excluded), to ensure the internal validity of our results.

On each website, a review of all personal care products was conducted, and only the products that contained front-of-package natural claims were registered in the database, alongside its product type classification, brand, type of natural claims held, and type of presentation on the packaging, and the level of naturalness claimed. Duplicates of the same product within or between websites and different sizes of the same product were removed from the database.

3.1.2. Results

During the exploratory research, 425 products with natural claims were identified, from 41 brands, ranging from shampoos, conditioners, and hair masks to face and body washes, deodorants, and toothpaste (Appendix A). The claims can be divided into two categories. The first one is related to ingredient-focused claims (e.g., “natural extracts”, “natural origin ingredients”) which include 42 % of the products analyzed, and the second one is the product-focused claims (e.g., “natural formula”) that corresponds to 58 % of the products that were assessed. Between these two categories, we have 10 different variations of claims uncovered in this study, however, three claims alone account for 80 % of the total. Table 2 summarizes the results.

From the total universe of products analyzed, 328 of them (77.18 %) include the product's naturalness percentage in their packaging claim. Further on, 93.45 % of “natural origin” and 86.61 % of “natural origin ingredients” claims – the top identified claims – included the naturalness level of the product as well. The level of naturalness found in packaging

Table 2

Type of natural claims found in personal care products packaging.

| Types of natural claims | Frequency | Relative frequency |
|---------------------------------|-----------|--------------------|
| Natural origin | 168 | 39.53 % |
| Natural origin ingredients | 127 | 29.88 % |
| Natural | 45 | 10.59 % |
| Natural extracts | 43 | 10.12 % |
| Natural origin extracts | 17 | 4.00 % |
| Natural formula | 10 | 2.35 % |
| Natural ingredients | 7 | 1.65 % |
| Vegetal origin | 4 | 0.94 % |
| Natural derived ingredients | 3 | 0.71 % |
| With natural vegetable extracts | 1 | 0.24 % |
| Total | 425 | 100 % |

claims in this study varied from 77 % to 100 %, however, only 0.07 % of the products studied show a level of naturalness lower than 90 %. In truth, most products in the personal care category claim to be 90 % natural or more – 93.29 % of the products in the study include the percentage of naturalness. Even more so, 63.72 % of the products with the naturalness percentage, claim to have a naturalness level of 95 % or higher.

Regarding the visual presentation of said claims on products' packaging, more than half of the claims studied (54.35 %) were presented on products' packaging as text integrated on a round label. The second most frequent form of claims display was through text only, representing 29.65 % of the claims. Indeed, these two forms of visual presentation of the claims represent 84 % of the total cases studied, while the rest is represented by other 3 different types of visual presentation – text on the rectangular label (9.41 %), text and icon (5.88 %), text on a round label with an icon (0.71 %), respectively (examples of logos can be found on Appendix).

3.1.3. Discussion

From this analysis, it becomes clear that claims such as “natural origin” and “natural origin ingredients” are the most used by marketers when communicating the naturalness of their products. Indeed, the most used claim in previous papers, “natural”, is only the third most frequent claim in the personal care segment. Additionally, pairing claims with the naturalness percentage of the product or its ingredients is a standard procedure, mainly with naturalness levels higher than 90 %, more specifically levels of naturalness of “90 %”, “98 %” and “100 %”.

Therefore, it is crucial to understand the advantages and disadvantages of these natural claims in terms of eliciting consumers' perceptions and influencing their shopping intentions. Hence, the previously identified top claim type and visual presentation were used in the experimental design of Study 1, to create the ideal image to present the natural condition of the study to inquiries.

3.2. Study 1

After the exploratory analysis of natural product claims in the personal care market, a second study was conducted to answer the research questions that arose with the development of the literature review. Study 1 was an online single-factor between-subjects experimental design, conducted to understand how natural claims (100 % natural origin vs. no-claim) influence consumers' perceptions regarding personal care products, and their shopping behavior intentions. Additionally, this experimental study aims to investigate the role of individual differences (health consciousness and environmental consciousness) on consumers' perceptions.

3.2.1. Procedures

To ensure the internal validity of the study, conditions were manipulated in a controlled manner. We used the image of a shampoo package that used natural claims. This product was chosen, first because it was the personal care product that was mentioned the most in the Pilot Study. Furthermore, previous experimental studies have been conducted using this product as a reference (Luchs et al., 2010). The scenarios and manipulated images are available in the Appendix. The quantitative data was collected by using an online survey created on Qualtrics, and the software SPSS (version 27) was used to process and analyze the data.

3.2.2. Measures

Initially, respondents were questioned about health consciousness (Mai and Hoffmann, 2015) and environmental consciousness (Grunert and Juhl, 1995). All participants were then primed with a situational text, for them to think as if they were shopping in a supermarket, and they were randomly assigned to one of the conditions, in which they saw a shampoo package with or without a natural claim. After the

manipulation, respondents assessed perceived efficacy (Vanbergen et al., 2020) ($\alpha = 0.93$), perceived safety (Bauer et al., 2013) ($\alpha = 0.95$), sensorial expectations (Brakus et al., 2009), purchase intentions (Barber et al., 2012). For the manipulation checks consumers rated how natural they perceived the product to be (Rozin, 2005; Scott et al., 2020). As control variables we included the importance of attributes (Luchs et al., 2010), subjective knowledge regarding natural products (Ghazali et al., 2017), and greenwashing perceptions (Chen and Chang, 2013), to capture to what extent consumers perceive natural claims as misleading techniques employed by companies to improve the environmental features of their products. Moreover, considering that consumers usually implicitly associate naturalness, sustainability or higher ethicality with gentleness-related product attributes and lower naturalness or ethicality with strength-related product attributes we include 2 scales to assess respondents' perceptions of product strength and gentleness (Luchs et al., 2010). All constructs were measured on a 7-point Likert scale, and the detailed items used in the experiment are in Appendix.

To ensure that the survey was clear and understandable, a pre-test was conducted where 10 individuals from the same pool as the main study revised it, including two individuals who work in the beauty and personal care sector. Following their feedback and insights, some modifications were made before the survey was published online.

3.2.3. Sample

Participants were invited to collaborate in an online research survey about consumers' perceptions and shopping behavior of personal care products. They were recruited through posts on authors' social media and in groups related to cosmetics and overall natural products. Additionally, participants were stimulated to share the questionnaire with other individuals they knew. Therefore, a mix between convenience and snowball sampling techniques was used. We received 305 complete responses, of which 49 were excluded because they failed to respond correctly to the attention check (46) or they did not remember the manipulation (3). Therefore, the final sample encompassed 256 responses, 73 % of which were female, and 36 % were between 18 and 25 years old (the full sample description is available in Appendix). We believe this predominance of women in the sample is because one of the criteria to answer the survey was to have experience purchasing haircare products since this was the category being tested.

Nonetheless, we checked for the influence of gender on the dependent variables and there was not a difference in the levels of perceived efficacy ($t(254) = 0.885, p = 0.378$), perceived safety ($t(254) = 0.941, p = 0.348$), sensorial expectations ($t(254) = -0.870, p = 0.385$), nor purchase intentions ($t(254) = -0.490, p = 0.312$), considering male and female respondents.

3.2.4. Results

To assess the validity and reliability of the data we checked the Kaiser-Meyer-Olkin Measure of Sampling Adequacy for the overall data set ($KMO = 0.83$), Bartlett's Test of Sphericity ($\chi^2_{(256)} = 5552.910, p < 0.001$) and a principal component analysis with a Promax Rotation (PCA) with 39 items. We excluded some items due to PCA results, and the final data set had 36 items, KMO results were acceptable ($KMO = 0.831$) and so are Bartlett's test results ($\chi^2_{(256)} = 5148.935, p < 0.001$). For the PCA nine components had eigenvalues over Kaiser's criterion of 1 and in combination explained 70.34 % of the variance. All items that load on the components had no cross-loadings higher than 0.3, or, if they had so, their higher loading was higher than 0.6, therefore, they were kept. The items that cluster on the same components suggest that component 1 represents greenwashing perceptions, component 2 environmental consciousness, component 3 perceived security, component 4 represents product knowledge, component 5 health consciousness, component 6 represents purchase intentions, component 7 perceived efficacy, component 8 gentleness importance and component 9 represents sensorial expectations. Following, we analyzed the construct's reliability using two

major criteria – Composite Reliability (CR) and Cronbach's Alpha and all constructs have values higher than 0.7. The average variance extracted (AVE) of constructs was above 0.5, except for environmental consciousness may be explained because the scale used measures of self-reported behavior (Appendix). The tests show that the distributions are slightly different from normal, especially for purchase intentions and therefore, we will report *t*-test results and Mann-Whitney *U* tests since the latter is the non-parametric alternative to an independent samples *t*-test.

When purchasing personal care products (i.e., shampoos), respondents considered gentleness-related attributes (e.g., safe, gentle, and healthy) more relevant for their decision ($M = 5.82; SE = 0.85$), than attributes related to the strength ($M = 4.27; SE = 1.33$) of the product (e.g., powerful, strong, effective). This suggests that a product perceived to be more natural than other competitors could be seen as better or more suitable when shopping for personal care items. The level of subjective product knowledge of the sample is average, however, there is a higher variance between inquiries ($M = 4.08; SE = 1.29$). The sample of this study had high levels of health consciousness ($M = 5.39; SE = 0.99$) and environmental consciousness ($M = 5.12; SE = 0.95$), as well as high levels of greenwashing perceptions ($M = 5.69; SE = 0.86$). These levels are high and may not be representative of the average citizen. There was no difference in these variables across the conditions, nor a different effect on other variables. However, there was a difference in the effect on purchase intentions for different levels of greenwash perceptions ($F(18, 237) = 1.68, p = 0.044$), therefore we considered this variable as a control for tests including the dependent variable purchase intention.

Manipulation checks worked as expected and participants in the natural claim group perceived the shampoo to be more natural ($M = 74.99; SE = 22.08$) than participants in the control group ($M = 45.88; SE = 21.09; F(1, 254) = 116.080, p < 0.001$). Likewise, attributes associated with a product that is gentle and safe to one's body and health were more frequently associated with respondents in the condition of natural claims ($M = 5.93, SE = 0.83$) than in the control group ($M = 5.69, SE = 0.86; t(254) = 2.23, p = 0.027$). For the direct effects, on average, participants rated the natural claimed shampoo higher in perceived efficacy ($M = 4.80, SE = 0.98$) than the control group ($M = 4.32, SE = 0.92$), $t(254) = 3.99, p < 0.001$. These results are opposite to H1a which suggested that natural claim would negatively influence perceived efficacy.

When considering perceived security as the dependent variable, individuals in the natural claim condition reported higher levels ($M = 4.70, SE = 1.21$) than participants from the control group ($M = 3.74, SE = 1.08$), $t(254) = 6.70, p < 0.001$. Therefore, we confirm hypothesis H1b. Regarding participants sensorial expectations, the ones in the natural-claim group expected a better sensorial experience from that shampoo ($M = 4.48, SE = 1.02$) than the participants in the control group ($M = 3.80, SE = 1.12$), $t(254) = 5.06, p < 0.001$. Thus, confirming H1c.

To check the effect on purchase intentions we ran an ANCOVA to control the covariate greenwashing perceptions. The effect was significant ($F(2, 253) = 44.33, p < 0.001$) and participants that were on the natural-claim group had higher levels of purchase intentions ($M = 4.39, SE = 1.24$) than the ones of participants from the control group ($M = 3.32, SE = 1.34$). Fig. 2 summarizes the direct effects.

To examine the parallel mediation model related to H2 we used model 4 in PROCESS SPSS macro (Hayes, 2018) with greenwashing perceptions as the covariate. Previously, regression assumptions were tested, and they were met. Firstly, the results show that natural claims significantly positively influenced perceived efficacy ($b = 0.467, SE = 0.120; p < 0.001$), perceived safety ($b = 0.993, SE = 0.144; p < 0.001$) and sensorial expectations ($b = 0.680, SE = 0.135; p < 0.001$). Additionally, perceived efficacy had a significant positive impact on purchase intentions ($b = 0.399, SE = 0.083; p < 0.001$), and so did sensorial expectations ($b = 0.422, SE = 0.073; p < 0.001$). Perceived safety was found to not be a significant predictor of purchase intentions

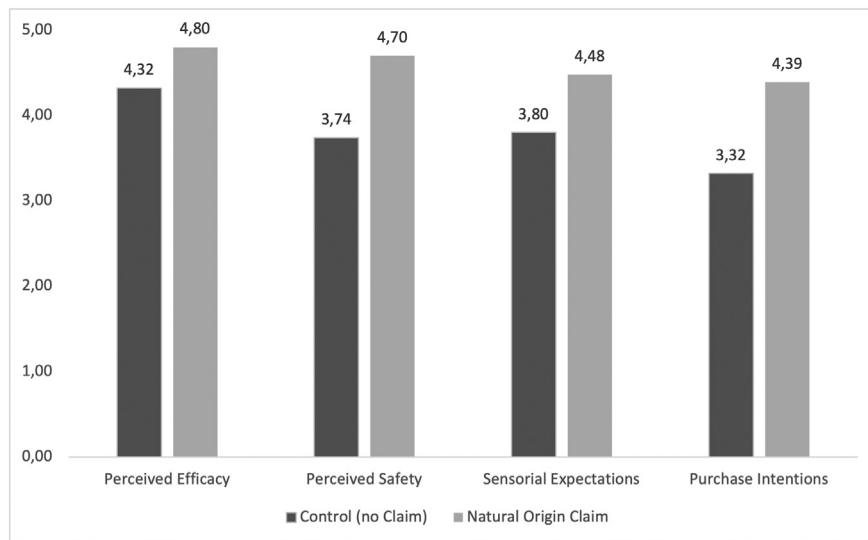


Fig. 2. Mean values of perceived efficacy (PE), perceived safety (PS), sensorial expectations (SE), and purchase intentions (PI) per experimental group.

($p = 0.169$). Natural claims were still found to be a significant predictor of purchase intentions after controlling for the mediators ($b = 0.517$, $SE = 0.143$; $p < 0.001$).

The indirect effects were tested using a bootstrap technique with 5000 bootstrap samples, at a 95 % confidence interval (CI). These results indicated that the indirect effect of natural claims on purchase intentions through perceived efficacy ($b = 0.134$, $SE = 0.044$, 95 % CI = 0.056, 0.233) and through sensorial expectations ($b = 0.205$, $SE = 0.055$, 95 % CI = 0.104, 0.321) are statistically significant, hence, partially mediating the relationship between natural claims and purchase intentions. The role of perceived safety as a mediator was not significant ($b = 0.066$, $SE = 0.054$, 95 % CI = -0.033 , 0.178).

Hypothesis H3 and H4 predicted that the mediation effects through the product's perceived attributes would be moderated by health consciousness and environmental consciousness. To examine these conditional mediation effects on purchase intentions we used Model 9 of PROCESS (Hayes, 2018). The hypothesis H4a was the only one supported by this analysis. Environmental consciousness was found to moderate the effect of natural claims on perceived efficacy ($b = 0.250$, $SE = 0.130$, $t = 1.917$, $p = 0.05$). Greater perceived efficacy was associated to a higher purchase intention ($b = 0.685$, $SE = 0.073$, $t = 9.315$, $p < 0.001$). This moderated mediation effect is supported by the index of partial moderated mediation = 0.171 ($SE = 0.084$, 95 % CI = 0.003, 0.335).

The conditional indirect effect was stronger in those individuals high in environmental consciousness ($b = 0.531$, $SE = 0.139$, 95 % CI = 0.272, 0.811) and non-significant for those with low levels of environmental consciousness ($b = 0.092$, $SE = 0.126$, 95 % CI = -0.151 , 0.346), which confirmed H4a. Fig. 3 represents the test of simple slopes. The other partial moderated effects were not significant, and neither was the moderation of health consciousness.

3.2.5. Discussion

Results from Study 1 suggest that natural claims influence consumers' perceptions about product sustainable attributes, and some of these perceptions also influence purchase intentions. Specifically, in line with our theorizing, natural claims positively influence consumers' perceived safety ratings, supporting H1b (Bauer et al., 2013; Li and Cao, 2020; Meier et al., 2019b). Natural claims also positively influence sensorial expectations, supporting H1c (Apaolaza et al., 2017, 2014), and purchase intentions (Berry et al., 2017; Davis and Burton, 2019). However, contrary to the hypothesized association between natural claims and lower efficacy ratings made with H1a and contradicting previous results from Meier et al. (2019b) and Meier and Lappas (2016) that

natural products are perceived as less effective, we found that natural claims positively impact perceived efficacy ratings. Therefore, H1a is not supported. This may be explained by the fact that most participants in the sample have high levels of environmental consciousness and value gentleness attributes when buying shampoos, then, naturalness is an asset for them (Luchs et al., 2010), which may positively influence products' attributes.

Additionally, while perceived efficacy and sensorial expectations were found to mediate the influence of natural claims on product purchase intentions, supporting H2a and H2c respectively, perceived safety was not significant in the mediation effect. Therefore, H2b was not supported. This may lead us to infer that, in line with findings from Meier and Lappas (2016) that participants still prefer natural drugs even when they are described as less safe, the natural-is-better bias in the personal care industry might be stronger than beliefs about safety. Furthermore, as safety is a great concern and very regulated by EU laws and directives, consumers may not consider safety as a decisive factor when shopping for shampoos. Besides, we found that natural claims still influenced purchase intentions even after considering the mediators. This is in line with previous conclusions from Li and Cao (2020), suggesting that the preference for natural products is not only explained by

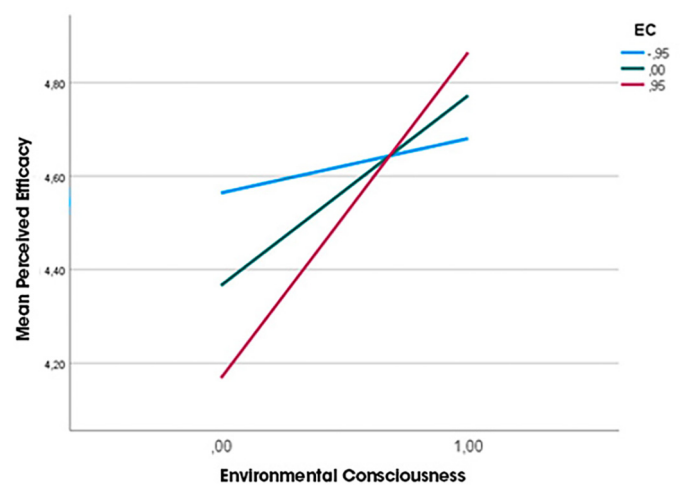


Fig. 3. Graphical representation of the test of simple slopes (conditional effects of the moderator - environmental consciousness - on the path of natural claims to perceived efficacy).

instrumental reasons (specific properties of the product at hand), but also by ideational reasons - general beliefs of the superiority of the said product or connection to an idea of well-being.

Significant results were only found regarding the moderating effect of environmental consciousness on the influence of natural claims on perceived efficacy, which means that H4a was supported, while H4b, H4c, H3a, H3b, and H3c were not supported. We found that people who have higher levels of environmental consciousness perceive those natural products to have higher efficacy than individuals with lower levels of environmental consciousness and perceive conventional shampoos to be less effective when in comparison to individuals with lower levels of environmental consciousness.

Interestingly, respondents also reported higher levels of greenwashing perceptions. When corporate discourse is not perceived as being authentic, activism can lead to the perception that the brand is deceiving its customers with illegitimate arguments, or inconsistent with its practices (Vredenburg et al., 2020). The findings of Study 1 show that these perceptions can indeed jeopardize one's behavior towards a product or a brand. When natural claims are perceived as illegitimate or associated with greenwashing, the intentions to purchase the products decrease.

Finally, the findings add to the literature (e.g., Li and Cao, 2020) by further investigating the impact of nature connectedness (which could be a proxy for environmental concern) on consumers' bias and adoption of natural products. It also advances previous studies on the halo effect of natural claims on perceptions of positive attributes such as healthiness, safety, as well as purchase intentions (Apaolaza et al., 2017; Berry et al., 2017; Román et al., 2017). Nonetheless, Study 1 demonstrated that this effect holds in the cosmetics category of products that may be perceived as less harmful to one's health than in food or beverage categories. Considering studies focused on natural cosmetic products (Kim and Seock, 2009) our findings add interesting variables such as perceived safety, sensorial expectations, and perceived efficacy, besides environmental concerns and greenwashing perceptions one may have when making purchase decisions involving natural claims.

4. Conclusions

Brands and marketers have been increasingly promoting their products as sustainable and using natural claims to enhance consumers' purchase intentions and perceptions of natural products. In two studies, this research extends previous literature regarding natural claims and the natural-is-better bias, in the context of natural personal care products (Grappe et al., 2022; Sadiq et al., 2021).

4.1. Theoretical Contributions

First, the present research extends the natural-is-better bias literature in the field of sustainable consumption. Prior research has demonstrated that natural foods (Amos et al., 2019; Apaolaza et al., 2017; Migliore et al., 2018) and medical natural products (Li and Cao, 2020; Scott et al., 2020) were perceived as healthier, safer, and were preferred when in comparison to conventional alternatives. This research adds to this field of knowledge by examining the bias for a different type of product, revealing that natural claims in the personal care market also trigger halo effects that positively influence individuals' perceptions of the product's effectiveness, safety, and sensory aspects. Furthermore, it contributes to the impact packaging has on the association consumers make with health attributes (Togawa et al., 2019).

Second, we further demonstrate that the influence of natural claims is not only limited to consumers' perceptions of products' attributes but also to purchase intentions (Marcon et al., 2022). Indeed, such claims directly influence purchase intentions due to bias and ideational reasons (Meier et al., 2019a), but also by affecting consumers' perceptions regarding natural products. Thus, we extend previous research on naturalness perceptions of sustainable products, especially the recent literature focused on natural cosmetics and personal care products (Kumar et al.,

2021; Grappe et al., 2022). More specifically, our findings uncover the underlying process of perceived efficacy and sensorial expectations, mediating the relationship between natural claims and purchase intentions.

Lastly, this study reveals that consumers with higher levels of environmental consciousness rate the effectiveness of natural products higher than individuals with low levels of environmental consciousness. Thus, we extend the findings of Kim and Seock (2009) and Sadiq et al. (2021) and advance the understanding of other mechanisms that influence the impact of natural claims on purchase intention, besides environment or health concerns already suggested by Grappe et al. (2022).

Natural claims were found to influence consumers' perceptions of efficacy, safety, and sensorial expectations. Our findings contribute to the literature, as most studies focused on the natural food and medicine segment, and this study was able to confirm the existence of a naturalness "halo" in the personal care category. However, in contrast with previous literature that found that natural products are considered to be less effective (Luchs et al., 2010; Scott et al., 2020), we found that natural claims positively influence a product's perceived efficacy rating. The same positive influence was found for sensorial expectations, in line with previous literature about food and drugs (Bauer et al., 2013; Li and Cao, 2020).

Additionally, we extend on the previous research by examining consumers' perceptions (safety, efficacy, and sensorial expectations) as mediators on the influence of natural claims on consumers' purchase intentions of cosmetics. Indeed, we concluded that perceived efficacy and sensorial expectations mediate the influence of natural claims on purchase intentions. However, natural claims still influence purchase intentions when accounting for the mediators. Moreover, greenwash perceptions work as a covariate that also influences the impact of these variables on the intention to purchase goods that use natural claims on the packaging. This adds to the research on natural claims, suggesting that the preference for natural products is not only explained by instrumental reasons, but also by ideational reasons in consumers' minds (Li and Cao, 2020). In this sense, greenwashing perceptions can be directly associated with this ideological perspective, which can backfire and threaten the brand image and trigger negative behaviors (Swaminathan et al., 2020; Vredenburg et al., 2020), such as reducing the purchase intentions of a product that has a natural seal on its packaging, but it is not perceived as legitimate.

This research also adds to the literature by investigating individual differences and their influence on consumer biases (e.g., Meier et al., 2019a). According to previous studies conducted in the area (Kumar et al., 2021; Kim and Seock, 2009; Mai and Hoffmann, 2015), we examined the impact of health and environmental consciousness in the relationship between natural claims and consumers' judgments regarding personal care products. However, we only found a significant effect of environmental consciousness on consumers' efficacy judgments. Extending the previous literature (Kim and Seock, 2009; Li and Cao, 2020), we found that individuals with high levels of environmental consciousness find natural products to be more efficacious than individuals with low levels of environmental consciousness and consider synthetic products to be less effective than individuals with low levels of environmental consciousness. This study draws from these results and suggests that individuals more concerned with the environment are more prone to the natural-is-better bias, mainly by having stronger instrumental reasons for the consumption of such products, due to stronger halos elicited by natural claims. Therefore, concerns about the environment might serve as more enduring motives for the preference of natural personal care products than concerns about personal health. In other words, the perception of adopting a more sustainable behavior is stimulated by natural claims and it influences purchase intentions.

4.2. Practical Implications

To the best of our knowledge, this is the first conclusive research that examines the effect of natural claims displayed on product packaging on purchase intentions in the personal care segment, which has a market volume in Europe of €49.66bn (Statista, 2022). This makes these results

relevant not only for researchers but also for companies that operate in this market and aim to adopt sustainable principles (Kolling et al., 2022).

Firstly, we conclude that natural claims can favorably influence consumers' perceptions of efficacy, safety, and sensorial expectation, while also indirectly impacting shopping intentions in the personal care market. This is relevant information for brands that already apply such claims in the packaging or that intend to change their products to include a higher level of natural ingredients and therefore develop cosmetics that aim to compete in this niche.

Secondly, by verifying that perceived efficacy and sensorial expectations mediate the influence of natural claims on purchase intentions, brands need to promote and educate consumers regarding the efficacy and sensorial aspects of their products. Brands could therefore use tactics to convey higher efficacy and sensorial beliefs, such as testimonials and experimental results from personal care testing to enhance the natural characteristics of products and increase these positive halos, leading to higher purchase intentions.

Third, we demonstrate that environmental consciousness impacts the halos elicited by natural claims on consumers' efficacy judgments. Such findings are important to practitioners since brands often invest their marketing efforts to emphasize health and safety benefits, such as the absence of chemical ingredients and unwanted ingredients from their formulas (Kim and Seock, 2009). Nonetheless, according to this study, it is also important for brands to communicate the environmental benefits and sustainability advantages of their natural products and create campaigns targeting environmentally conscious consumers, to have a higher return over investment and a more sustainable strategy, leveraging the power of natural claims.

Although the effect of greenwashing perceptions was not the focus of this research, the results show that it may reduce purchase intentions, therefore is necessary that companies work on the trust consumers associate with the brand (Kumar et al., 2021), and the perceived legitimacy of claims used in packaging and advertising (Grappe et al., 2022), to avoid potential retaliatory behaviors (Vredenburg et al., 2020).

These findings also offer some insights to policymakers. Since natural claims can mislead customers to perceive a product as healthier (Musicus et al., 2022) or safer (Li and Cao, 2020), it is important to understand these relationships. While we found that natural claims have a positive influence on consumers' safety perceptions, we reveal that perceived safety does not significantly mediate the relationship between natural claims and purchase intentions in the personal care market. This suggests that a natural-is-better bias may be stronger than safety judgments for some individuals, and some products, like personal care items. One possible reason is that the EU does not have a clear regulation related to natural claims. Even though there are international guidelines about natural claims related to cosmetics (e.g., ISO 16128 standard) consumers do not necessarily understand what these guidelines mean.

Hence, the inappropriate use of natural claims by brands and the lack of regulation of self-declared claims are of substantial concern due to the favorable effects of natural claims on purchase behavior found in this research. To explore the best of the positive effects of natural claims and avoid deception of consumers by the illegitimate use of such attributes, efforts could be made by policymakers in agreement with brands to create an official definition and criteria for self-declared natural claims, to create

more transparency and fair competition between brands, and maybe boost the development of truly sustainable products.

4.3. Limitations and Future Research

The conclusions from this research should be taken with some caution, as it is subject to a few limitations which may outline the directions for future research. Our experimental study mainly focused on one type of natural claim (100 % natural origin). Future research should examine different natural claims and different percentages of naturalness to increase the generality of results and try to understand the best claims in the personal care market.

Moreover, while this research demonstrates the positive effects of natural claims regarding shampoos' perceived efficacy, safety, and sensorial expectations, these effects may not hold for other personal care products like hand sanitizers and deodorants, where efficacy is crucial (Luchs et al., 2010). Additionally, as we only conducted an online study, this context is not fully comparable to the retail marketplace, where consumers have multiple products to choose from.

Moreover, the sample had high levels of health and environmental consciousness and greenwashing perceptions, which may not be representative of the average citizen, hence further research should include a more diverse pool of respondents. Likewise, this study did not involve the exchange of money and actual choice and purchase of the product. This also contributes to a lower external validity of the results, however, this provides an opportunity for future research to further understand the natural-is-better bias, by measuring actual behavior.

Furthermore, while the main goal of this research was to examine the influence of natural claims in a fast-paced environment, such as mass-market retailers – i.e., supermarkets – future work should investigate the impact of the type of point of purchase on consumers' judgments regarding products with natural claims. For example, Lunardo and Saintives (2013) found that for food, traditional markets conveyed a higher sense of naturalness for products with natural claims than supermarkets. So, we propose that the type of point of purchase should be used as a moderator in future research regarding the natural-is-better bias.

Finally, commercial packaging may contain multiple messages that use text, images, and stylistic features. Previous research has investigated health and environmental claims associated with food packaging (Schifferstein et al., 2022). Future studies could analyze in detail these design elements and how they relate to consumers' perceptions and behaviors that result from natural claims.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A

A.1. Pilot study

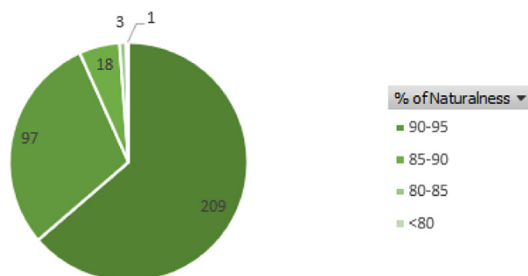
Results of the research regarding natural claims on personal care products' packaging.

| Visual presentation | Relative frequency |
|-------------------------------|--------------------|
| Text on round shape | 54.35 % |
| Text | 29.65 % |
| Text on rectangular shape | 9.41 % |
| Text + icon | 5.88 % |
| Text on round shape with icon | 0.71 % |
| Total | 100.00 % |

Types of visual presentation of natural claims and % of naturalness identified in the study.

| | | | | |
|-----------------------|-----------|---------------|------------------------------|-----------------------------|
| | | | | |
| Text on a round label | Text only | Text and icon | Text + icon on a round label | Text on a rectangular label |

Distribution of Naturalness Percentage



Appendix B

B.1. Study 1

Measurement scales used in Study 1

| Constructs | Items | Measurement items | References |
|-----------------------------|-------|---|----------------------------|
| Naturalness judgments | Scale | How natural is this product? (From 0 to 100) | Rozin, 2005 |
| Perceived efficacy | PE1 | I consider this product to be effective | Vanbergen et al., 2020 |
| | PE2 | I think this product would reach its objectives | |
| | PE3 | The ingredients in this product are potent | |
| Perceived safety | PS1 | I feel that this product is free of chemical residues | Bauer et al., 2013 |
| | PS2 | I believe this product is not contaminated | |
| | PS3 | This products' ingredients are free from harmful substances | |
| | PS4 | I believe this product is safe to use | |
| Sensorial perceptions | SE1 | This product makes a strong impression on my senses | Brakus et al., 2009 |
| | SE2 | This product is interesting in a sensory way | |
| | SE3 | This product appeals to my senses | |
| Purchase intentions | PI1 | I would consider purchasing this product | Barber et al., 2012 |
| | PI2 | I intend to try this product | |
| | PI3 | I am likely to buy this product | |
| Product knowledge | PK1 | I know a lot about natural personal care products | Ghazali et al., 2017 |
| | PK2 | I have a great purchasing experience with natural personal care products | |
| | PK3 | I am familiar with natural personal care products | |
| | PK4 | I understand the features and benefits of natural personal care products | |
| Environmental consciousness | EC1 | I would be willing to stop buying products from companies guilty of polluting the environment, even if it is inconvenient to me | Maloney and Ward, 1973 |
| | EC2 | I usually discuss environmental issues with my friends | |
| | EC3 | I am furious when I think about the damage caused to plant and animal life by pollution | |
| | EC4 | When I think of ways industries pollute the environment, I get frustrated and angry | |
| | EC5 | I would donate money to a foundation to help improve the environment | |
| | EC6 | I usually read articles or view documentaries/programs about environmental issues | |
| | EC7 | At my house, we buy products that result from sustainable production | |
| Health consciousness | HC1 | I reflect a lot about my health | Mai and Hoffmann, 2015 |
| | HC2 | I am very self-conscious about my health | |
| | HC3 | I usually pay attention to my internal feelings about my health | |
| | HC4 | I am often examining my health | |
| Greenwashing perceptions | GP1 | Most companies mislead with words about the environmental features of their products | Leonidou and Skarmas, 2017 |
| | GP2 | Most companies mislead with visuals or graphics about the environmental features of their products | |
| | GP3 | Most companies provide vague or seemingly un-provable environmental claims for their products | |
| | GP4 | Most companies overstate or exaggerate the environmental features of their products | |
| | GP5 | Most companies leave out or hide important information about the real environmental features of their products | |
| Gentleness factor | G1 | Safe | Luchs et al., 2010 |
| | G2 | Healthy | |
| | G3 | Gentle | |
| Strength factor | S1 | Strong | Luchs et al., 2010 |
| | S2 | Powerful | |
| | S3 | Effective | |

Natural claim manipulation

"Imagine that you are shopping in your usual supermarket. You just remembered that you need a new shampoo, and you head to the place where this type of hygiene product is normally found. Before choosing what you are going to take, you start to analyze all the available products and find the following shampoo. Take the normal time you would use at the supermarket to examine this shampoo. The next questions will be about this product."

Natural Product:



Control Product:



Sample characteristics (Study 1):

| Classification questions | Answers | Frequency | Relative frequency |
|---|-------------------|-----------|--------------------|
| Gender | Male | 69 | 27.0 % |
| | Female | 187 | 73.0 % |
| Age | 18–25 | 92 | 35.9 % |
| | 26–35 | 44 | 17.2 % |
| | 36–45 | 51 | 19.9 % |
| | 46–55 | 52 | 20.4 % |
| | >55 | 17 | 6.6 % |
| Educational level | Primary school | 1 | 0.4 % |
| | Middle school | 10 | 3.9 % |
| | Secondary school | 56 | 21.9 % |
| | Bachelor's degree | 123 | 48.0 % |
| | Master's degree | 66 | 25.8 % |
| | <10.000€ | 42 | 16.4 % |
| Gross annual income | 10.000 to 19.999€ | 75 | 29.3 % |
| | 20.000 to 29.999€ | 56 | 21.9 % |
| | 30.000 to 39.999€ | 38 | 14.8 % |
| | 40.000 to 49.999€ | 21 | 8.2 % |
| | >50.000€ | 24 | 9.4 % |
| Country | Portugal | 231 | 90.2 % |
| | Other | 25 | 9.8 % |
| Do you work in the beauty, cosmetics, personal care sector? | No | 222 | 86.7 % |
| | Yes | 34 | 13.3 % |

Factor loadings, reliability, and average variance extracted (AVE):

| Construct | Items | Factor loadings | Cronbach's alpha | CR | Ave |
|------------------------|-------------------|-----------------|------------------|-------|-------|
| Perceived efficacy | PE1 | 0.867 | 0.845 | 0.872 | 0.697 |
| | PE2 | 0.877 | | | |
| | PE3 | 0.747 | | | |
| | PS1 | 0.872 | | | |
| Perceived safety | PS2 | 0.887 | 0.895 | 0.908 | 0.713 |
| | PS3 | 0.850 | | | |
| | PS4 | 0.680 | | | |
| | SE1 | 0.809 | | | |
| Sensorial expectations | SE2 | 0.738 | 0.852 | 0.856 | 0.667 |
| | SE3 | 0.635 | | | |
| | PI1 | 0.737 | | | |
| Purchase intentions | PI2 | 0.839 | 0.863 | 0.871 | 0.693 |
| | PI3 | 0.834 | | | |
| | Product knowledge | PK1 | | | |

(continued on next page)

(continued)

| Construct | Items | Factor loadings | Cronbach's alpha | CR | Ave |
|-----------------------------|-------|-----------------|------------------|-------|-------|
| Greenwashing perceptions | PK2 | 0.923 | 0.883 | 0.915 | 0.682 |
| | PK3 | 0.944 | | | |
| | PK4 | 0.626 | | | |
| | GP1 | 0.807 | | | |
| | GP2 | 0.843 | | | |
| | GP3 | 0.851 | | | |
| | GP4 | 0.864 | | | |
| Health consciousness | GP5 | 0.785 | 0.827 | 0.885 | 0.659 |
| | HC1 | 0.812 | | | |
| | HC2 | 0.860 | | | |
| | HC3 | 0.827 | | | |
| | HC4 | 0.747 | | | |
| | EC1 | 0.586 | | | |
| | EC2 | 0.609 | | | |
| Environmental consciousness | EC3 | 0.860 | 0.815 | 0.854 | 0.463 |
| | EC4 | 0.813 | | | |
| | EC5 | 0.704 | | | |
| | EC6 | 0.613 | | | |
| | EC7 | 0.507 | | | |
| | G1 | 0.868 | | | |
| | G2 | 0.790 | | | |
| Gentleness factor | G3 | 0.735 | 0.728 | 0.841 | 0.639 |

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