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**Clean labeling: is it about the presence of benefits or the absence of detriments?
Consumer response to personal care claims**

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Abstract:

The personal care industry is gradually shifting its promises toward health and environment-based messages, promoting either the addition of beneficial ingredients or processes or the removal of potentially deleterious additives or procedures. However, prior research has failed to encapsulate and organize the plethora of claims and to link consumer concerns, knowledge, and the influence of prosocial norms to attitude and purchase intention. This study examines the impact of absence- and presence-framed claims referring either to health or environmental friendliness on attitude and behavioral intention toward personal care products. It also explores differences in consumer profiles (concerning health, the environment, appearance, peer pressure, or disparate levels of front-of-package literacy). Using a framework based on Ajzen's (1985) theory of planned behavior enriched with variables such as personal altruistic and egoistic concerns, claim credibility, and attitude, this study shows the superiority of absence- versus presence-framed claims for health and environment-based messages. Both claims pertaining to the environment and to health generate a positive attitude and are powerful in further converting it into buying intention.

Keywords:

Clean labeling; front-of-package claims; message framing; health; environmental friendliness; TPB

Introduction

The current trend of consumers switching to products that are healthier for them or more respectful of the environment has led to numerous questionings and changes in the appreciation of and consumption habits relating to personal care products (Rossi, Prlic, and Hoffman 2007; Faber 2019). Consumers typically use personal care products (haircare, skincare, oral care, bath and shower products, deodorants, etc.) to practice personal hygiene and enhance their physical appearance and personal well-being (Shaaban and Alhajri 2020). Beyond seeking these basic functions, an increasing number of personal care consumers tend to avoid dangerous or controversial ingredients, materials, or processes while simultaneously favoring those supporting noble functions and positive outcomes (Lee 2011).

When consumers try to bridge the gap between their beliefs or inclinations and their actual consumption habits, they tend to turn toward specific compounds with a good reputation (e.g., natural, organic, plant based, and sustainable) and bypass those suffering from opprobrium (e.g., parabens, silicones, sulfates, fragrance, and allergens) (GNT Group 2015). Clean beauty is thus becoming a norm that meets the increasing demand for safe, transparent, and sustainable options. To allow informed choices, the hygiene and personal care market has witnessed the emergence of a number of claims, messages, logos, and labels referring to ideas of presence (e.g., “with,” “contains”) or absence (e.g., “free from,” “0%”), whether pertaining to health or to the environment. Leading claims in 2020 epitomized this trend, such as “natural,” “organic,” “no parabens,” “no aluminium,” or “fragrance free”¹ (Euromonitor 2021). Specifically, both absence and presence messages are progressing; 65% of all cosmetics sold in the US had a “paraben free” claim in 2017² (Statista 2017), and “free-from” personal care achieved 13% growth in 2020 (NielsenIQ 2021). Environmental concerns also speak for the movement; in 2020, plastic-free cosmetics online searches went up to 897% compared to 2019 figures (NielsenIQ 2021)³.

The use of absence and presence claims on personal care products by firms and their brands raises three main questions. First, what is the impact of presence- and absence-framed claims referring either to health or environmental friendliness on attitude and behavioral intention toward personal care products? Second, are there any differences in perceptions of “with” versus “free from” for both health and environment-friendly products? Third, are there differences in terms of consumer profiles (concerning health, the environment, personal appearance, peer pressure, or with disparate levels of front-of-package [FOP] literacy)?

Although a considerable amount of research has investigated consumers’ motivations to develop preferences toward clean and sustainable products (e.g., Kim and Chung 2011; Hsu, Chang, and Yansritakul 2017; Photcharoen, Chung, and Sann 2020), few studies have been conducted to refine this understanding from the viewpoint of framed messages (White, MacDonnell, and Dahl 2011; Newman et al. 2012); to the best of our knowledge, none has focused on the personal care product category, in particular. Previous research merely analyzed the corollary between cosmetic claims and purchase intentions (Kim and Chung

¹ Euromonitor (2021), "World Market for Beauty and Personal Care," *Euromonitor International*, <https://www.euromonitor.com/article/world-market-for-beauty-and-personal-care-2>

² Statista (2017), "Share of free-from claims among cosmetics and personal care market in the United States in 2017," *Statista*, <https://www.statista.com/statistics/900276/share-of-free-from-claims-among-us-personal-care-and-cosmetics-market/>

³ NielsenIQ (2021), "The clean beauty trend is more than skin deep," *NielsenIQ*, <https://nielseniq.com/global/en/insights/education/2021/the-clean-beauty-trend-is-more-than-skin-deep/>

2011; Hansen, Risborg, and Steen 2012; Ghazali et al. 2017), exposing a lack of careful and comprehensive comparison between framed messages, especially referring to presence or absence frames. Indeed, previous work rooted in the framing effect (Levin, Schneider, and Gaeth 1998; Jin, Zhang, and Chen 2017) has mainly explored the impact of positive versus negative information that generally provides an almost identical theoretical outcome (e.g., “95% of natural ingredients” vs. “5% of chemical ingredients” or “everyday low prices” vs. “everyday value”) on consumer preferences and decision making (Levin and Gaeth 1988; Meyers-Levy and Maheswaran 2004; Septianto, Lee, and Putra 2021). However, research that specifically explores the effect of presence- and absence-based claims in personal care remains missing. Indeed, none has focused on claims that alternatively convey ideas of the presence or absence of an ingredient or process while building on the framing effect (André, Chandon, and Haws 2019; Khalil et al. 2021).

To address the identified research gap and answer the aforementioned questions, this research will focus on presence- and absence-based claims, comparing claims with distinct meanings (i.e., rendering different outcomes) yet still grasping contrast nuances (e.g., “with aloe vera” vs. “perfume free”) (André, Chandon, and Haws 2019). We will do so by focusing on a health or green pledge (Banovic et al. 2019) implying a potential gain through the addition of a trendy component or the removal of a fearful one. Thus, this research will avoid any loss suggestion to the consumer and solely focus on potential gains (i.e., by adding a profitable ingredient or process or removing a harmful one) while still comparing the effect of presence or absence. More specifically, four claims, alternatively referring to health or the environment, will be studied in this research: one pertaining to presence and health (with avocado oil), one to absence and health (paraben free), one to presence and the environment (with recyclable plastic), and one to absence and the environment (reduced environmental impact).

Formally, on top of the framing effect underlying this research, we will consider the theory of planned behavior (TPB) as an appropriate model to understand consumer attitude and purchase intention of presence- or absence-framed personal care messages. This tool has been extensively used and proven powerful in explaining preferences and decision-making processes in the personal care industry (e.g., Kim and Chung 2011; Hsu, Chang, and Yansritakul 2017; Photcharoen, Chung, and Sann 2020) and in many other product categories and human behaviors (Ajzen 1991; Miller 2017; Xu, Prybutok, and Blankson 2019; Kumar, Prakash, and Kumar 2021). This way, we will examine the effect of the alternative presence or absence-based claims to encourage positive attitudes and purchase behaviors toward personal care through message framing.

Ultimately, for both environment- and health-based claims, this research will provide evidence of the superiority of claims focusing on the absence of a component or process compared with claims advertising the presence of an ingredient or practice by using an extended version of the TPB model. Accordingly, this study presents framing valence as a moderator of the effect investigated. While message framing efficiently regulates communication performance (e.g., White, MacDonnell, and Dahl 2011), there is a scarcity of work specifically examining the most efficient valence in personal care in terms of presence- or absence-framed claims. This study will also indicate that presence- or absence-framed claim credibility has a positive impact on attitude toward this claim, which in turn influences attitude toward personal care bearing this claim. Indeed, previous research has shown evidence of the importance of message credibility in prognosticating attitude toward the message (Louis and Lombart 2018; Martins et al. 2019; Grappe et al. 2021) and the product

bearing it (Lanero, Vázquez, and Sahelices-Pinto 2020; Grappe et al. 2021). This positive attitude is driven by egoistic (concerns for personal health) and altruistic (concerns for the environment) values, impacting purchase intention of personal care with presence- or absence-framed claims. Although not considered in the original version of the TPB model, personal concerns can foretell subsequent attitude, intention, and behavior (Gardner 2015), and discerning individualistic (egoistic) and unselfish (altruistic) values is crucial in interpreting sustainable buying intentions (Prakash et al. 2019). These buying intentions are also explained by subjective norms for all framed claims and by perceived behavioral control for presence-framed messages. Therefore, this study further incorporates claim credibility and personal concerns as extensions of the TPB model to further investigate attitude and purchase intentions toward products holding presence- or absence-framed claims.

From a theoretical point of view, this research offers several meaningful contributions to the extant literature. We further enhance Ajzen's (1985) original TPB model to better appreciate the significance of consumers' values and concerns (for their own health, for the environment, or for their personal appearance) (Banovic et al. 2019), as well as their perceived credibility and attitude toward framed claims on attitude and personal care purchase intentions (e.g., Kim and Chung 2011; Kumar et al. 2021). Furthermore, framing theory, and specifically the study of frame valence as to the presence or absence of components or processes, has been used as a moderator of our model and applied to an understudied product category (i.e., personal care). From a practical perspective, this research provides contributions to managers who are willing to promote sustainable attributes based on health or the environment. Specifically, we find that consumers can prioritize altruistic or egoistic values, and these concerns must be considered. We provide insight into the types of frames companies should prefer depending on the facets they choose to put forward. Brands should also favor building credibility around their framed claims.

In the rest of this paper, we review literature on the TPB, on consumers' personal concerns when purchasing personal care products, and on message credibility and the framing effect while justifying our hypotheses. We then outline our methodology and experimental results, in which we examine attitudinal and behavioral construction. Finally, we discuss theoretical, managerial, and public policy implications, as well as limitations and future research avenues.

Conceptual framework and research model

The theory of planned behavior

From past research, intention to perform a given behavior, such as purchasing, can be measured with the help of attitude toward relevant products, perceived behavioral control in implementing this behavior, and subjective norms through the Theory of Planned Behavior (TPB) (Ajzen 1991; Ghazali et al. 2017; Prakash et al. 2019; Kumar, Prakash, and Kumar 2021). As such, TPB is a widely used framework in studies focusing on personal care (e.g., Kim and Chung 2011; Hsu, Chang, and Yansritakul 2017; Photcharoen, Chung, and Sann 2020). As already mentioned, previous research merely examined the effect of some cosmetic claims on purchase goals, revealing a dearth of thorough comparison between framed messages (Kim and Chung 2011; Hansen, Risborg, and Steen 2012; Ghazali et al. 2017). However, the performance of the TPB appears to be strong in explaining intention in the domain of health, such as the preference for organic products, and environment-friendly behaviors, such as recycling, preference for sustainable packaging, green apparel, or even green hotels (Godin and Kok 1996; Conner, Norman, and Bell 2002; Verma and Chandra

2018; Wang et al. 2018; Kumar, Prakash, and Kumar 2021). As the TPB is widely used and accepted in the field of consumer behavior, it seems highly relevant in potentially shedding light on attitudinal and behavioral construction when choosing healthier or environment-friendly personal care.

Impact of attitude, perceived behavioral control, and subjective norms on purchase intention

Extant research on attitude reveals that the more a person has a positive attitude toward a behavior, an idea, an object, an event, or other people, the more that the latter has a chance of being adopted (e.g., Fishbein 1976; Maio, Haddock, and Verplanken 2018). According to Fishbein and Ajzen (1974), a belief influences attitude toward an object, subsequently determining behavioral adoption. Prior studies have demonstrated that attitude largely impacts sustainable purchase (Nguyen, Lobo, and Nguyen 2018; Prakash et al. 2019). As far as personal care and health intentions are concerned, previous studies have shown that attitude positively influences purchase intention of organic (e.g., Kim and Chung 2011; Photcharoen, Chung, and Sann 2020) or paraben-free cosmetics (Hansen, Risborg, and Steen 2012). Accordingly, we suggest the following:

H1: Consumer attitude toward a cosmetic product displaying a framed claim has a positive influence on purchase intention of this product.

Perceived behavioral control (PBC) is defined as the perception of the ease or difficulty of executing a given behavior. The higher the personal control (e.g., on time, resources, knowledge, and interest), the higher the behavioral intention (Ajzen 1985). PBC has proven efficient in explaining personal care purchase intention (Kim and Chung 2011; Hsu, Chang, and Yansritakul 2017). On the other hand, subjective norms relate to peer influence and the desire to be adequately seen by others (Ghazali et al. 2017). Indeed, there is pressure from one's social environment to adopt certain behaviors and buy certain products or brands. Subjective norms are also solid influences in predicting buying intention of organic (Photcharoen, Chung, and Sann 2020) or "free from" cosmetics (Hansen, Risborg, and Steen 2012).

We therefore posit the following:

H2: Perceived behavioral control (a) and subjective norms (b) have a positive influence on consumer purchase intention of a cosmetic product displaying a framed claim.

Significance of personal concerns

According to Ajzen (2011), attitude derives automatically and consistently from beliefs. Even if irrational or biased, beliefs are at the origin of attitudes, intentions, and, ultimately, behaviors. However, several studies have shown the influence of variables other than TPB ones on intention and attitude (Prakash and Pathak 2017; Tommasetti et al. 2018; Kumar, Prakash, and Kumar 2021). Although behavior follows reasonably from individual's internal and external beliefs, more recent work has suggested personal concerns play an important role in influencing purchase intentions (Geraerts et al. 2008; Smith and Paladino 2010; Groening, Sarkis, and Zhu 2018). For instance, an environmental attitude is formed through personal beliefs, concerns, values, and intentions regarding a given environmental issue and behavior (Schultz et al. 2004). In this research, we will expand and thus increase the predictability of the TPB model by examining the potential antecedents of attitude. To this extent, we will enrich the original model with new constructs: egoistic values (health and appearance), altruistic values (concerns with the environment), and credibility of framed claims.

Despite the focus of studies on health intentions, attitudes, and behaviors, recalling individualistic outcomes for the consumer (e.g., performing health exams, choosing a healthier nutritional alternative, or making improved financial decisions), few have examined collective consequences (e.g., adopting environment-friendly attitudes to improve collective well-being) (Newman et al. 2012). As such, when favoring one's own health, a person expects rapid payback, whereas when adopting a sustainable behavior for the planet, a consumer chooses societal welfare and a greater, hardly foreseeable cause over his/her own convenience. Such behaviors are scarcely explained by previous frame valence frameworks (White, MacDonnell, and Dahl 2011). Therefore, the present study introduces a framework aimed at comparing both attitudinal outcomes, whether they are altruistic or egoistic.

Previous research has demonstrated that personal considerations and consumers' values are strong predictors of attitude, intention, and behavior (Sutton 1994; Weng and de Run 2013). Combined with cognitive cues, such as those suggested by the TPB, such concerns can enhance the predictability of behavioral adoption (Gardner 2015). Ostensibly, personal concerns seem crucial in the explanation of attitude in relation to the consumption of healthy or environment-friendly personal care. More specifically, previous work has shown the influence of altruistic and egoistic values on sustainable purchase intentions (Prakash et al. 2019). Egoistic values put forward self-gain and lead consumers to act in their own interests (De Groot et al. 2013). Altruistic values, on the other hand, empower people to act for the well-being of others and the general welfare without a personal agenda (Yadav 2016). Prior studies found that altruistic values based on environment conservation (i.e., concerns for the environment) positively influence attitudes toward organic and eco-friendly personal care (Kim and Seock 2009; Kim and Chung 2011), whereas egoistic values based on individualism, such as personal health and appearance, explain positive attitudes toward natural (Photcharoen, Chung, and Sann 2020) and free-from-paraben personal care (Hansen, Risborg, and Steen 2012). Thus, we hypothesize the following:

H3: Concerns pertaining to (a) the environment and (b) health positively influence consumer attitude toward a cosmetic product displaying a framed claim related to one of these concerns, and (c) personal appearance has a positive influence on consumer attitude toward a cosmetic product regardless of the framing of the claim it holds.

Role of credibility

For a claim to be plausible, it must rapidly translate into relevant interest and significant credibility (Ganz and Grimes 2018). Short and simple claims are generally considered more persuasive cues during purchase decisions. They often refer to a particular attribute and not to the product in its entirety (Binninger 2017). According to MacKenzie and Lutz (1989), ad credibility can be delineated as the extent to which the consumer perceives claims made about the brand in the ad to be truthful and believable. The perceived credibility of a message significantly contributes to the prediction of an attitude toward it (Louis and Lombart 2018; Martins et al. 2019; Grappe et al. 2021), and the attitude toward an ad or a claim has a positive influence on the attitude toward the brand (MacKenzie, Lutz, and Belch 1986; Kumar et al. 2021) and its products and services (Lanero, Vázquez, and Sahelices-Pinto 2020; Grappe et al. 2021). Furthermore, credibility has been proven to actively influence the effects of a persuasive message (Petty, Cacioppo, and Goldman 1981; Cian, Longoni, and Krishna 2020). Concerning green ads and messages promoting environment-friendly products, greater ad credibility generates positive ad (Louis and Lombart 2018) and brand attitudes (Tucker et al. 2012). Similar conclusions have been reached by research studying health behaviors,

especially when the messages were guilt inducing (Cotte, Coulter, and Moore 2005). When compared, environmental claims of organic food are more salient and credible than health claims (Jäger and Weber 2020). Finally, prior studies have shown that attitude toward a given message is a key starting point to influence subsequent attitudes and intentions, specifically attitude toward the product (Bergkvist 2009; Prendergast et al. 2010). In terms of environmental claims, it has been indicated that carbon offsetting messages have a positive influence on consumer evaluation of the affiliated product (Zhang et al. 2019).

Building upon these analogies, we conjecture the following:

H4: The credibility of a framed claim has a positive influence on consumer attitude toward this claim.

H5: Consumer attitude toward a framed claim has a positive influence on attitude toward the cosmetic product displaying this claim.

Framing effect

A key challenge in expressing health or environmental values to consumers is building the most efficient communication architecture. In influencing attitude and behavior, message framing has proven to be a valuable tool in promoting distinct meanings and perceptions and thus emphasizing particular attributes (e.g., Levin and Gaeth 1988; Levin, Schneider, and Gaeth 1998; Janiszewski, Silk, and Cooke 2003). In this respect, in attribute framing, a product, option, or message is described using a valence attribute label to influence communication efficiency. Valence frameworks attempt to predict attitude and behaviors while examining in contrast the communication of a positive goal frame (i.e., focusing on a potential benefit or perk for the consumer, with positive presence framing being one of all possible applications of positive goal framing) and a negative goal frame (i.e., drawing attention to preventing an unfavorable outcome, with negative absence framing being one of all possible applications of negative goal framing) (Levin, Schneider, and Gaeth 1998). For instance, in terms of health or environmental sustainability goals, a personal care product may display that it has added a beneficial ingredient or process, such as a pure plant extract or recyclable packaging (positive presence framing); alternatively, it may display that it has removed a deleterious component, such as a harmful chemical, or that its production is carbon neutral (negative absence framing). While many studies have explored this concept, the findings do not equivocally support either side (André, Chandon, and Haws 2019). Few studies have implemented and compared presence and absence frames as specific applications of the general effect of valence framing, which is the goal of our research.

In general, previous research has illustrated that consumers favor negative framing as being more effective at shifting behaviors (e.g., Kahneman and Tversky 1981; Schneider et al. 2001). Negative framing is particularly efficacious when influencing consumer recycling (White, MacDonnell, and Dahl 2011) and sustainable lifestyles (Newman et al. 2012) or when subjects are presented with low efficacy conditions (i.e., when they are uncertain, a recommendation will lead them to the desired outcome) and engage in extensive information processing (Maheswaran and Meyers-Levy 1990; Block and Keller 1995).

However, concerning food products and nutrition advertisements, positive framing has generally been demonstrated to be more effective. For instance, it is the case when describing leanness or fatness (i.e., 75% lean vs. 25% fat) (Levin and Gaeth 1988); when promoting healthiness (Kees, Burton, and Tangari 2010), taste, and health (André, Chandon, and Haws 2019); or when making other (unwarranted, meaningless) nutrition claims (Carpenter, Glazer, and Nakamoto 1994; Ikonen et al. 2020). Positive frames have also demonstrated superiority

in influencing attitudes and behaviors when consumers show low levels of involvement in deciphering information (Maheswaran and Meyers-Levy 1990), are capable of decontextualization and abstractness (White, MacDonnell, and Dahl 2011), or engage in health-affirming (vs. illness-detecting) compartments (O’Keefe and Jensen 2007; Rothman et al. 1999).

Regarding presence and absence frames as particular models of the general effect of valence framing, André, Chandon, and Haws (2019) suggested that presence and absence claims have mixed repercussions on consumer behavior. Claims based on the presence of positive attributes convey taste and health more effectively than claims based on absence, while the correlation between unhealthy and tasty attributes is carried by absence-based claims. Research also highlights the superiority of absence-based claims as persuasive messages compared to conventional food attributes, such as “gluten free” or invented messages (Priven et al. 2015) and “free from GMO” or “free from palm oil” (Hartmann et al. 2018), although they lack a comparison with positive frames. Although food products are well studied, there is a gray area in terms of other non-durable household goods, such as personal care, when tackling the influence of framed messages (Hansen, Risborg, and Steen 2012). Such investigations would help assess the generalizability of the effects of framed attributes. Indeed, the purpose of this study is to further study the ways and consequences of consumers’ quest for well-being. As suggested by prior work, well-being and wellness are not solely limited to food products, but also related to other fast-moving consumer goods such as personal care (Sun-Waterhouse 2011; Meiselman 2016). Apropos of personal care, Hansen, Risborg, and Steen (2012) have illustrated that attitude and social norms positively influence paraben-free cosmetics purchase intention, although research lacks explicit insight into presence and absence framing. Yet, such comparisons may delineate mixed effects on consumer behavior.

Following precedent work on the impact of framed communication, our key prediction is as follows:

H6: Message framing moderates the relationships posited, in which the relationships are stronger for absence-based claims versus presence-based claims regardless of whether the claim focuses on consumer health or the environment.

Figure 1 presents an outline of the research model. First, we forecast buying intention of personal care with presence or absence framing valence to change with attitude toward the product, perceived behavioral control, and subjective norms. We also expect attitude toward personal care with a presence- or absence-based claim to be influenced by both altruistic (i.e., environmental considerations) and egoistic concerns (i.e., health and personal appearance considerations). We further envisage personal care attitude with presence or absence framing valence to be explained by attitude toward the framed claim, itself regulated by the lent credibility to the claim. Ultimately, we predict stronger attitudinal and behavioral development when encountering absence rather than presence frames. Throughout the advancement of such relations, we draw from the TPB (Ajzen 1991; Kumar, Prakash, and Kumar 2021) and framing theory (Levin and Gaeth 1988; Jin, Zhang, and Chen 2017).

[insert Figure 1]

Methodology

Data collection

To test and validate our research model, we targeted consumers of personal care products as potential respondents. The data collection process lasted two months, and we only recruited, thanks to screening questions, individuals who bought personal care products during the last month (70.6% of the initial sample). Our final sample consisted of 684 respondents in Quebec, Canada, enrolled through the French social media pages of a Canadian brand selling personal care products. The average respondent age is 31, and the majority are women (81%), which corresponds to the purchasing situation in most households (Nilsson et al. 2015). Of this sample, 53% are single, 45% are common law partners or are married, and 61% have a bachelor, master, or doctorate degree.

[insert Table 1]

Experimental design

A total of 684 buyers of personal care products participated in a 2 (promise: health vs. environment friendly) \times 2 (claim: “with” vs. “free from”) between-subjects experiment. Thus, four claims will be studied: “with avocado oil,” “paraben free,” “with recyclable plastic,” and “reduced environmental impact.” A pre-test ($n = 60$) showed that consumers clearly understand that in the “with avocado oil” and “with recyclable plastic” claims, the manufacturer added an ingredient, material, or process that potentially has a positive impact on consumer health or on the environment. By contrast, consumers clearly understand that in the “paraben free” and “reduced environmental impact” claims, the manufacturer removed an ingredient, material, or process that potentially has a negative impact on consumer health or on the environment (Appendix 1). We have chosen not to study any combinations of claims within the same product because such boundaries allow us to better isolate, control, and study the effects. Furthermore, previous work has demonstrated that multiple claims tend to dilute the core message and that consumers do not perceive them as positively as focused, single claims (Barreiro-Hurle, Gracia, and De-Magistris 2010; Dufeu et al. 2014; Drugova, Curtis, and Akhundjanov 2020).

All 684 respondents of our experiment were randomly assigned to one of the four claims studied (i.e., “with avocado oil” [$n = 172$], “paraben free” [$n = 168$], “with recyclable plastic” [$n = 174$], and “reduced environmental impact” [$n = 170$]). We are above the necessary sample size for a model structure that can be determined by the sample size calculator for structural equation models proposed by Soper (2015). According to this calculator and given the following parameters (anticipated effect size = 0.3, desired statistical power level = 0.8, number of latent variables = 9, number of observed variables = 33, and probability level = 0.05), the recommended minimum sample size to detect effect is 184 observations/cases, and the minimum sample size for a model structure is 123 cases. Groups are homogeneous in terms of sex ($\chi^2 = 5.333$; p -value = 0.149), age ($F = 1.189$; p -value = 0.314), status ($\chi^2 = 14.156$; p -value = 0.291), and education level ($\chi^2 = 12.616$; p -value = 0.632). Table 1 presents their characteristics.

A shampoo bottle was chosen as the experimental personal care product. The penetration rate of hair products is very high in Canada (82%). The majority of consumers in the market use this product. It is purchased by both women and men, and brands continue to propose unisex products to these two targets (Datta 2018). Appendix 2 shows the shampoo bottle used in the manipulations, without any claim. The same shampoo bottle was presented to all respondents without indicating any brand reference to avoid introducing bias into their product judgment;

only the studied claim was altered. The respondents had to examine the shampoo bottle with one of our four claims or without a claim. Then, we asked them to answer an experimental structured questionnaire online while they kept this shampoo bottle in mind. For each item, the respondents were asked to indicate their degree of agreement on a six-point Likert scale ranging from “completely disagree” to “completely agree.” Finally, they had to answer demographic questions.

To confirm that the experiment worked, we used manipulation checks. The participants in the health condition indicated more strongly ($F = 9.996$; $p < 0.001$) that shampoos with claims pertaining to this condition were good for consumers’ well-being, compared with the participants in the environment-friendly condition (“with avocado oil” (Mean = 3.53) and “paraben free” (Mean = 3.66) versus “with recyclable plastic” (Mean = 2.88) and “reduced environmental impact” (Mean = 2.99)). The participants in the presence condition indicated more strongly ($F = 13.885$; $p < 0.001$) that shampoos with claims pertaining to this condition have benefited from the addition of valuable ingredients or processes, compared with the participants in the absence condition (“with avocado oil” (Mean = 4.08) and “with recyclable plastic” Mean = 4.03) versus “paraben free” (Mean = 3.00) and “reduced environmental impact” (Mean = 3.37)).

[insert Table 1]

Measures

The credibility of the studied claims was measured using four items inspired by the work of Moussa and Touzani (2008). Four items from the research of Maheswaran and Meyers-Levy (1990) were used to measure the attitude toward the claim. The attitude toward the cosmetic product was measured with three items from the study of Lombart and Louis (2012). Four items from the research of Zeithaml, Berry, and Parasuraman (1996) were used to measure purchase intention of this cosmetic product. Consumer concerns with health, the environment, and their personal appearance were measured with five, four, and four items inspired from the works of Kim and Seock (2009), Gould (1988), and Cash and Labarge (1996), respectively. Three items proposed by Hsu, Chang, and Yansritakul (2017) were used to measure subjective norms. PBC, envisioned as the reading and comprehension level of claims and FOPs, was measured with two items from the study of Redondo Palomo, Valor Martínez, and Carrero Bosch (2015). Consumers were asked to specify their degree of agreement or disagreement with each item (or level of probability for purchasing intention) on a six-point Likert scale ranging from “disagree completely” to “agree completely” (or “very unlikely” to “very likely”). The list of measurement items is shown in Appendix 3.

Results

The measurement and structural models have been tested separately with partial least squares structural equation modeling (PLS-SEM; with the software XLSTAT 2020) and a bootstrap procedure with 5,000 replications (Tenenhaus et al. 2005). PLS-SEM has been used for three main reasons, as pointed out by Hair et al. (2012, 2014) in their meta-analyses on the use of PLS-SEM in marketing research. PLS-SEM does not require the variables to follow a multivariate normal distribution. The computed Mardia’s coefficient is superior to $|3|$ in this research. PLS-SEM allows working with small samples. The sample sizes are inferior or close to 200 for the subsamples considered in this research, with a mean of 211.29 in the marketing

field. PLS-SEM allows working with models that include many latent variables. Our research model contains nine variables, with an average number of 7.94 in the marketing field.

Test of the measurement models

We performed confirmatory factor analysis to validate the unidimensional factor structure of our measurement scales. The loadings are greater than 0.5 and statistically significant at the 1% level. Thus, we consider that they are satisfactory (Table 2). Permutation tests (Chin and Dibbern 2010) indicated the partial invariance of the measurement scales for these groups. On the differences computed, 5% are significant at the 5% level. The composite reliabilities are also satisfactory ($CR > 0.7$). Lastly, the approach proposed by Fornell and Larcker (1981) established convergent validity. All average variances extracted are above 0.50 (Hair et al. 2019) (Table 2). The discriminant validity of the measurement scales was established through the heterotrait-monotrait (HTMT) method, which was recommended by Henseler et al. (2015) for variance-based SEM. The values in Table 3 are below the thresholds of 0.85 (Table 3).

[insert Tables 2 and 3]

Test of the structural models

Table 4 shows the results of the structural equation model of the four experimental groups studied, and Table 5 indicates the results of the multi-group findings (absence- vs. presence-framed claims) that were generated using the permutation tests (Chin and Dibbern 2010).

Regardless of the claim investigated, its credibility has a significant and positive impact on consumer attitude toward that claim, supporting H4. Thus, this research confirms previous studies (Louis and Lombart 2018; Martins et al. 2019; Grappe et al. 2021) indicating that the perceived credibility of a message contributes to the prediction of consumer attitude toward it. Permutation tests indicated that this impact is stronger for absence claims compared with presence ones in the health condition ($p < 0.10$) (“paraben free” ($\beta = 0.547$; $p < 0.01$) > “with avocado oil” ($\beta = 0.487$; $p < 0.01$)) and the environment-friendly condition ($p < 0.05$) (“reduced environmental impact” ($\beta = 0.668$; $p < 0.01$) > “with recyclable plastic” ($\beta = 0.563$; $p < 0.01$)).

Attitude toward the claim has a significant and positive impact on consumer attitude toward the personal care product in the four experimental groups, supporting H5. It corroborates Lanero, Vázquez, and Sahelices-Pinto (2020) and Grappe et al. (2021)’s conclusions on attitude toward an ad or a claim and its influence on attitude toward products and services. Permutation tests indicated that this impact is stronger for absence- compared with presence-framed claims in the health condition ($p < 0.10$) (“paraben free” ($\beta = 0.627$; $p < 0.01$) > “with avocado oil” ($\beta = 0.581$; $p < 0.01$)) and the environment-friendly condition ($p < 0.10$) (“reduced environmental impact” ($\beta = 0.626$; $p < 0.01$) > “with recyclable plastic” ($\beta = 0.543$; $p < 0.01$)).

Consumer attitude toward the cosmetic product is also influenced by health concerns for the claims “paraben free” ($\beta = 0.280$; $p < 0.01$) and “with avocado oil” ($\beta = 0.202$; $p < 0.01$), which pertain to health. Similarly, for the “reduced environmental impact” ($\beta = 0.305$; $p < 0.01$) and “with recyclable plastic” claims ($\beta = 0.283$; $p < 0.05$), which refer to the

environment, consumer attitude toward the product is influenced by environmental concerns. H3a and b are thus partially supported by our data. Permutation tests indicated that this impact is stronger in the health condition ($p < 0.10$). According to the studied claims pertaining to health or the environment, this research indicates the strategic roles of consumer egoistic or altruistic concerns, as suggested by previous works on natural (Photcharoen, Chung, and Sann 2020), free-from-paraben (Hansen, Risborg, and Steen 2012), and eco-friendly cosmetics (Kim and Seock 2009; Kim and Chung 2011). By contrast, consumer concerns for personal appearance do not have an impact on attitude toward the cosmetic product. H3c is therefore not supported by our data. This result could be explained by the experimental product chosen, a shampoo bottle. Consumers could perceive it as a personal hygiene product that satisfies a basic need and not as a cosmetic product, such as makeup or perfume, which potentially modifies physical appearance (Patel, Padhtare, and Saudagar 2015).

For the four studied claims, consumer attitude toward the product has a significant and positive impact on purchase intention of this product, supporting H1. Permutation tests indicated that, in the environment-friendly condition, the influence of absence-framed claims is stronger ($p < 0.05$) (“reduced environmental impact” ($\beta = 0.386$; $p < 0.01$) > “with recyclable plastic” ($\beta = 0.203$; $p < 0.05$)). Still, for all studied claims, subjective norms also have a significant and positive impact on consumer purchase intention toward the cosmetic product, supporting H2b. Permutation tests also indicated that, in the health condition, the influence of absence-framed claims is stronger ($p < 0.10$) (“paraben free” ($\beta = 0.527$; $p < 0.01$) > “with avocado oil” ($\beta = 0.459$; $p < 0.01$)). Similarly, PBC has a positive and significant impact on consumer purchase intention but only for presence-framed claims (“with avocado oil” ($\beta = 0.143$; $p < 0.05$) and “with recyclable plastic” ($\beta = 0.131$; $p < 0.05$)), which are probably more common to the consumers interviewed, as they are educated on recycling and are probably familiar with avocados from their food consumption. H2a is thus partially supported by our data.

The proposed research model and the explanatory variables considered explain between 46% and 51% of the consumers’ attitudes toward the cosmetic product and between 49.1% and 70.2% of purchase intention, depending on which claims are considered. Finally, this research establishes that, compared with the participants presented with a presence-based claim (advertising the presence of an ingredient or a practice), the respondents presented with an absence-based claim (communicating the absence of a component or process) manifest more positive attitudes and purchase intentions toward a personal care product for both health and environment-friendly conditions, largely supporting H6.

[insert Table 4]

Discussion

This study contributes to research on consumer pursuit of cleaner personal care alternatives. Although consumers have recently started to swap conventional cosmetics for healthier and more environmentally respectful substitutes, few studies have explored the effectiveness of these substitutes in triggering positive attitudes and purchase intentions (e.g., Kim, and Chung 2011). Specifically, our work draws from the TPB (Ajzen 1991; Kumar, Prakash, and Kumar 2021) and framing theory (Levin and Gaeth 1988; Jin, Zhang, and Chen 2017).

Consequently, this research shows the superiority of claims focusing on the absence of a component or process compared with claims advertising the presence of an ingredient or

practice, for both environmental and health-based claims, to build consumer attitude and buying behavior toward a personal care product. Both claims relating to the environment and health are efficient in generating a favorable attitude toward the product through perceived claim credibility and attitude toward it. Two claims, “paraben-free” and “reduced environmental impact,” which are linked to consumer health and the environment, respectively, seem particularly suitable and should be used for “free-from” personal care products. Fundamentally, this study contributes to research on consumers’ quest for well-being, for their own self as much as for others and the environment, when choosing personal care products. Indeed, although individuals are increasingly preoccupied with their personal health and the consequences of their choices on the planet, few studies have focused on these pre-requisites when consuming personal care commodities and, specifically, on presence- or absence-framed messages (André, Chandon, and Haws 2019; Khalil et al. 2021).

Theoretical implications

This research underlines the relevance of the TPB and, more specifically, of subjective norms, perceived behavioral control, and attitude variables in understanding the formation of consumer purchase intention toward personal care products displaying framed claims. To better interpret attitude and decision making when choosing healthy or sustainable personal care, this research proposes an enriched version of the TPB with variables that can discriminate different consumer profiles, such as personal altruistic and egoistic concerns. Our study is one of the few to thoroughly examine consumers’ attitudinal and behavioral construction toward both health and environmental concerns (Banovic et al. 2019) in personal care products that are used on an everyday basis (Shaaban and Alhajri 2020) while also aiming to understand the impact of claim credibility (Louis and Lombart 2018; Martins et al. 2019; Grappe et al. 2021). Across this adaptation of the TPB, this research highlights the conditions under which consumers are more reactive to products with health and environmental claims, focusing either on the presence (e.g., “with,” “contains”) or absence (e.g., “free from”) of a specific component, echoing the previous works of Photcharoen, Chung, and Sann (2020) and Hansen, Risborg, and Steen (2012) on organic and paraben free cosmetics, respectively.

Importantly, this research makes meaningful contributions to the current literature on framing and labeling, both theoretically and substantively. First, it complements the framing and labeling literature by studying it from a different angle; instead of focusing on potential gains or losses, our research illustrated the effect of presence- and absence-framed claims (Khalil et al. 2021). It draws on work proving that message framing can endorse similar meaning in substance yet dissimilar perceptions and goals (e.g., Levin and Gaeth 1988; Septianto, Lee, and Putra 2021). The input here is that a different perspective has been used. Indeed, instead of measuring and comparing the effect of positive or negative messaging presenting similar information with an identical outcome (e.g., made of 80% natural components vs. made of 20% chemical components), we compared different claims with disparate meanings and capacities but still with a health or environmental promise (e.g., “with avocado oil” vs. “paraben free”). Furthermore, this research is different from gain- and loss-framed literature in that our tested claims do not denote a potential loss of any kind when choosing a product bearing one of them (Mandel 2001; Jiang and Dodoo 2021). They all imply a certain gain, either for the health of the consumer or for the environment. Instead of focusing on gain or loss, this research refines the understanding of the effect of an addition or a removal of certain ingredients and processes that have proven trendy or fear arousing in the current cosmetic market. We thus shed light on equivocal conclusions in the literature about the superior

efficacy of positive (presence) or negative (absence) frames (e.g., Levin, Schneider, and Gaeth 1998; White, MacDonnell, and Dahl 2011; Jin, Zhang, and Chen 2017) by stressing the importance of the impact of altruistic considerations for the environment and egoistic concerns for one's own health or appearance, as well as peer pressure, claim credibility, and perceived ease in deciphering product information and claims. This absence or presence valence in personal care claims epitomizes our singular contribution.

Finally, this study fills the literature gap on consumer pursuit of cleaner personal care alternatives for their own or the planet. Few studies have explored how these concerns and effective brand communication are intertwined (Todd 2004; Kim and Chung 2011; Hansen, Risborg, and Steen 2012), and no research has focused on the effect of different message framing when disclosing relevant information. However, the food literature offers a strong study basis (e.g., Levin and Gaeth 1988; André, Chandon, and Haws 2019).

Managerial implications

From a practical point of view, this research provides relevant contributions to firms and their brands that target the most efficient ways of promoting health or environment-friendly personal care products, fulfilling altruistic or egoistic considerations. By demonstrating that absence-framed claims, referring to health or the environment, are superior to presence-based messages in building positive attitudes and generating buying behavior, this research illustrates that personal care companies should focus on communicating about the removal of conceivably detrimental components or processes. Both environmental and health claims are efficient in generating favorable attitudes toward the product, which in turn positively influence purchase intentions. This proves that “paraben-free” and “reduced environmental impact” claims are valuable tools in initiating consumer action. Along with the types of frames that companies should use to communicate greater benefits to the consumer, we argue about the importance of building credibility around chosen claims.

Moreover, claim framing and decision making in the personal care industry are crucial issues from a public policy viewpoint. Regulators in several countries bear guiding principles pertaining to claim governance. Although neither the Food and Drug Administration (FDA) nor Health Canada strictly regulate personal care messages or hold a list of approved or accepted claims, information must be truthful and not misleading (FDA 2020). The European Union even carries higher standards, and all claims must respect well-defined criteria (compliance, truthfulness, evidential support, honesty, fairness, and informed decision making) (Commission Regulation 2019). For example, a brand or a retailer cannot claim that a product will make the consumer healthier if there is no proof to back it. However, although none of the studied claims explicitly communicated on their ability to enhance health or their direct positive effects on the environment, consumers with high coincident concerns accordingly evaluated them better. This case of latent deception has been observed with tobacco products, in which “natural” or “additive-free” cigarettes were considered healthier and less dangerous than regular ones (Kelly and Manning 2014). To prevent potential deception and halo effects, we encourage policy makers to regulate presence- and absence-framed claims more tightly (Hastak and Mazis 2011).

Limitations and directions for future research

Although all the participants were consumers of different personal care products, they were recruited through the social media pages of a personal care brand, so they solely corresponded

to the target of this specific brand. This research could thus be reproduced over a more representative sample of consumers of personal care products across various segments and countries to potentially identify moderating effects. This would increase the generalizability of the results. Additionally, other personal care products (deodorant, facial cleanser, etc.) and cosmetic products (perfumes, skin care creams, etc.) could be investigated to maximize potential contrasts between women and men (a phenomenon we wanted to avoid in the present research). Healthiness and conservation values could also be envisioned as multifaceted constructs; indeed, claim type could help predict the effects of hedonic use (i.e., beyond hygiene) or healthy practices (i.e., beyond “camouflage” but promoting healthy body treatments).

Although we pointed out the weakness of work studying single claims, we lack a thorough exploration of all claims present in the market. Creating a conceptual framework of all claims in the market, progressing from a micro- to meso-level analysis, would be pertinent (André, Chandon, and Haws 2019). Furthermore, health and environmental messages often coexist, so testing their joint effect on attitude and purchase intention would be significant. Similarly, measuring the effect of quantity (the number of claims used to communicate a message) could be relevant, as brand managers often present their message using multiple claims (Olsen, Slotegraaf, and Chandukala 2014). However, the presence of many similar health messages has been shown to create confusion even if each piece of information taken individually provides positive utility (Barreiro-Hurle, Gracia, and De-Magistris 2010; Dufeu et al. 2014; Drugova, Curtis, and Akhundjanov 2020). Assessing this relationship with mixed health and environmental claims would thus be compelling. In the same vein, a major study exploring whether certain claim types are correlated to actual product quality (pertaining to ingredients and processes) would highly encourage the creation of generalized labeling systems that promote consumer health well-being.

The determining attribute that drives the superior effect of negative frames is likewise worth investigating. Indeed, it has been proven that negatively framed appeals often arise from fear-induced emotions or negativity bias (e.g., Cacioppo, Gardner, and Berntson 1997) and risk aversion (Tversky and Kahneman 1981). Compared with positive events, negative information often induces hastier reactions and generates greater cognitive processing (Peeters and Czapinski 1990). By contrast, potential barriers to absence-framed product consumption should be explored further (Sadiq, Adil, and Paul 2021). While our study considered motivations, variables originating from adoption resistance could help deepen our understanding of health and environmental claims and framed messages.

Lastly, future research could scrutinize the consequences of more responsible personal care consumption habits. Exposure to and purchase of green products have been shown to lead to strikingly divergent behavioral aftereffects (Mazar and Zhong 2010). Specifically, these consumers can engage in selfish and harmful behaviors, as their previous *green* consumption can conceivably give them the right to do so. Yet, a positive halo effect has also been observed (i.e., by consuming healthy and environment-friendly products, one is more inclined to engage in similar behaviors in the future). In our case, studying the general habits and consumption of people purchasing better personal care products would be of interest.

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Figure 1: Research model

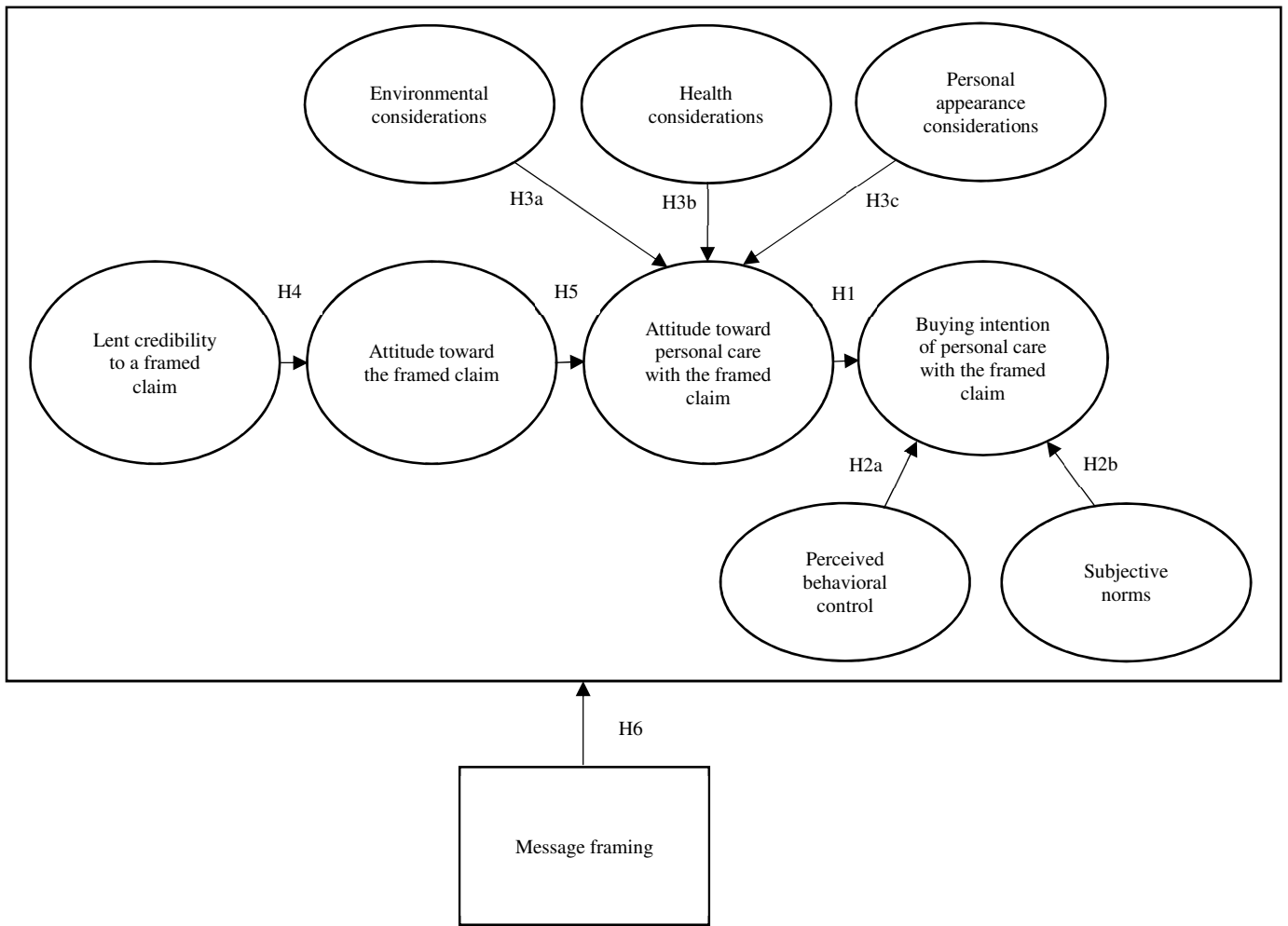


Table 1: Characteristics of the four groups studied

		With avocado oil (n = 172)	Paraben free (n = 168)	With recyclable plastic (n = 174)	Reduced environmental impact (n = 170)
Sex	Male	20%	17.2%	16.3%	12%
	Female	80%	82.8%	83.7%	88%
Age	Minimum	19	22	20	19
	Maximum	54	58	57	49
	Mean	29.8	32.1	30.9	30.6
	Standard deviation	8.1	8.9	8.7	7.7
Civil Status	Single	48%	52%	51%	48%
	Common law or married	49%	46%	46%	52%
	Separated or divorced	3%	2%	3%	0%
Education level	High school diploma or equivalent	12.0	10.1	13.2	13.3
	University certificate or diploma below the bachelor's level	24.0	27.3	23.7	32.0
	Bachelor, master, or doctorate	64.0	62.6	63.2	54.7

Table 2: Assessment of reliability and convergent validity

Construct	Item	With avocado oil (n=172)			Paraben free (n=168)			With recyclable plastic (n=174)			Reduced environmental impact (n=170)		
		Loading	CR	AVE	Loading	CR	AVE	Loading	CR	AVE	Loading	CR	AVE
Credibility lent to a framed claim (CR)	CR1	0.947	0.956	0.845	0.894	0.960	0.857	0.952	0.953	0.836	0.889	0.953	0.836
	CR2	0.932			0.935			0.934			0.942		
	CR3	0.899			0.951			0.871			0.897		
	CR4	0.898			0.923			0.898			0.929		
Attitude toward the framed claim (AFRC)	AFRC1	0.923	0.965	0.872	0.887	0.948	0.819	0.899	0.967	0.881	0.872	0.956	0.845
	AFRC2	0.936			0.934			0.961			0.938		
	AFRC3	0.923			0.942			0.962			0.949		
	AFRC4	0.952			0.854			0.930			0.917		
Attitude toward personal care with the framed claim (APC)	APC1	0.960	0.976	0.931	0.958	0.968	0.909	0.967	0.977	0.935	0.937	0.967	0.906
	APC2	0.972			0.954			0.971			0.955		
	APC3	0.963			0.949			0.962			0.963		
Buying intention of personal care with the framed claim (BI)	BI1	0.914	0.959	0.855	0.858	0.922	0.748	0.973	0.985	0.944	0.905	0.951	0.830
	BI2	0.934			0.882			0.974			0.913		
	BI3	0.927			0.873			0.976			0.925		
	BI4	0.924			0.847			0.964			0.901		
Health considerations (HC)	HC1	0.845	0.947	0.783	0.827	0.953	0.804	0.884	0.936	0.745	0.896	0.960	0.826
	HC2	0.928			0.936			0.852			0.944		
	HC3	0.919			0.914			0.825			0.902		
	HC4	0.900			0.938			0.869			0.916		
	HC5	0.827			0.864			0.885			0.885		
Environmental considerations (EC)	EC1	0.840	0.885	0.660	0.857	0.913	0.725	0.889	0.918	0.737	0.901	0.906	0.709
	EC2	0.698			0.796			0.797			0.679		
	EC3	0.860			0.828			0.884			0.861		
	EC4	0.842			0.921			0.860			0.906		
Personal appearance considerations (PAC)	PAC1	0.841	0.884	0.657	0.853	0.911	0.718	0.840	0.904	0.702	0.849	0.902	0.697
	PAC1	0.748			0.793			0.801			0.736		
	PAC1	0.830			0.850			0.856			0.857		
	PAC1	0.820			0.891			0.853			0.891		
Subjective norms (SN)	SN1	0.971	0.981	0.944	0.956	0.964	0.899	0.963	0.956	0.878	0.956	0.953	0.871
	SN2	0.972			0.958			0.935			0.922		
	SN3	0.973			0.930			0.913			0.922		
Perceived behavioral control (PBC)	PBC1	0.884	0.877	0.781	0.880	0.872	0.774	0.826	0.811	0.683	0.869	0.861	0.755
	PBC2	0.884			0.880			0.826			0.869		

Notes: CR = Composite Reliability. AVE = Average Variance extracted.

Table 3: Assessment of discriminant validity with the HTMT

Dataset	Construct	1.	2.	3.	4.	5.	6.	7.	8.	9.
With avocado oil (n=172)	1. CR									
	2. AFRC	0.557								
	3. APC	0.430	0.582							
	4. BI	0.296	0.588	0.727						
	5. HC	-0.044	0.135	0.029	0.104					
	6. EC	-0.035	-0.107	-0.099	-0.146	0.416				
	7. PAC	-0.028	-0.043	-0.132	0.130	0.645	0.260			
	8. SN	0.265	0.558	0.601	0.784	0.066	0.047	-0.015		
	9. PBC	0.036	0.246	0.254	0.353	-0.235	-0.343	-0.255	0.193	
Paraben free (n=168)	1. CR									
	2. AFRC	0.505								
	3. APC	0.625	0.434							
	4. BI	0.463	0.683	0.539						
	5. HC	0.113	0.359	0.213	0.249					
	6. EC	0.079	0.210	0.193	0.186	0.548				
	7. PAC	0.007	0.190	-0.023	0.265	0.321	-0.094			
	8. SN	0.355	0.589	0.476	0.820	0.187	0.136	0.298		
	9. PBC	0.231	-0.061	0.302	0.189	-0.071	-0.252	0.214	0.231	
With recyclable plastic (n=174)	1. CR									
	2. AFRC	0.560								
	3. APC	0.593	0.636							
	4. BI	0.691	0.689	0.615						
	5. HC	0.133	0.216	0.150	0.135					
	6. EC	0.341	0.430	0.318	0.363	0.587				
	7. PAC	0.046	0.005	0.227	0.125	0.334	0.103			
	8. SN	0.650	0.715	0.633	0.826	0.100	0.484	0.113		
	9. PBC	-0.052	-0.138	-0.217	0.128	-0.322	-0.200	-0.037	0.061	
Reduced environmental impact (n=170)	1. CR									
	2. AFRC	0.709								
	3. APC	0.624	0.769							
	4. BI	0.469	0.719	0.609						
	5. HC	-0.052	0.149	-0.070	0.274					
	6. EC	-0.016	0.163	0.193	0.311	0.684				
	7. PAC	0.362	0.317	0.169	0.234	0.272	0.105			
	8. SN	0.255	0.433	0.363	0.650	0.154	0.369	0.038		
	9. PBC	-0.178	0.071	0.064	0.066	-0.069	-0.260	-0.026	-0.030	

Table 4: Results of the structural equation model

Dataset	Hypothesis	Path	Std β	Std error	t-value	p-value	Confidence interval	Supported	R ²	f ²	Q ²
With avocado oil (n=172)	H4	CR → AFRC	0.487	0.089	5.422***	<0.001	[0.305; 0.648]	Yes	0.233	0.303	0.190
	H5	AFRC → APC	0.581	0.087	6.725***	<0.001	[0.363; 0.753]	Yes	0.479	0.482	0.347
	H3b	HC → APC	0.202	0.086	2.605***	<0.001	[-0.151.; 0.428]	Yes		0.142	
	H3a	EC → APC	0.036	0.098	n.s.	0.924	[-0.226.; 0.305]	No		0.009	
	H3c	PAC → APC	0.021	0.088	n.s.	0.249	[-0.228.; 0.225]	No		0.019	
	H1	APC → BI	0.415	0.087	4.740***	<0.001	[0.224; 0.609]	Yes	0.702	0.317	0.601
	H2b	SN → BI	0.459	0.086	5.354***	<0.001	[0.253; 0.638]	Yes		0.404	
	H2a	PBC → BI	0.143	0.066	2.123**	<0.050	[0.010; 0.278]	Yes		0.063	
Paraben free (n=168)	H4	CR → AFRC	0.547	0.098	5.536***	<0.001	[0.352; 0.712]	Yes	0.296	0.419	0.257
	H5	AFRC → APC	0.627	0.090	6.801***	<0.001	[0.433; 0.787]	Yes	0.510	0.657	0.471
	H3b	HC → APC	0.280	0.086	2.919***	<0.001	[-0.217; 0.397]	Yes		0.147	
	H3a	EC → APC	0.073	0.093	n.s.	0.476	[-0.208; 0.272]	No		0.005	
	H3c	PAC → APC	0.098	0.082	n.s.	0.292	[-0.176; 0.313]	No		0.012	
	H1	APC → BI	0.411	0.072	5.632***	<0.001	[0.226; 0.610]	Yes	0.690	0.334	0.513
	H2b	SN → BI	0.527	0.071	7.386***	<0.001	[0.311; 0.714]	Yes		0.574	
	H2a	PBC → BI	-0.020	0.059	n.s.	0.581	[-0.155; 0.112]	No		0.003	
With recyclable plastic (n=174)	H4	CR → AFRC	0.563	0.096	5.796***	<0.001	[0.390; 0.710]	Yes	0.313	0.453	0.274
	H5	AFRC → APC	0.543	0.097	5.634***	<0.001	[0.297; 0.749]	Yes	0.451	0.472	0.419
	H3b	HC → APC	-0.030	0.106	n.s.	0.628	[-0.303; 0.187]	No		0.003	
	H3a	EC → APC	0.283	0.112	2.608***	<0.001	[-0.107; 0.486]	Yes		0.132	
	H3c	PAC → APC	-0.030	0.090	n.s.	0.610	[-0.143; 0.203]	No		0.007	
	H1	APC → BI	0.203	0.084	2.374**	<0.050	[-0.034; 0.460]	Yes	0.671	0.078	0.639
	H2b	SN → BI	0.648	0.084	7.679***	<0.001	[0.443; 0.804]	Yes		0.863	
	H2a	PBC → BI	0.131	0.067	2.241**	<0.050	[-0.122; 0.269]	Yes		0.080	
Reduced environmental impact (n=170)	H4	CR → AFRC	0.668	0.087	7.670***	<0.001	[0.524; 0.788]	Yes	0.446	0.806	0.377
	H5	AFRC → APC	0.596	0.093	6.524***	<0.001	[0.402; 0.760]	Yes	0.460	0.647	0.421
	H3b	HC → APC	-0.040	0.118	n.s.	0.166	[-0.288; 0.011]	No		0.008	
	H3a	EC → APC	0.305	0.116	2.803***	<0.001	[-0.169; 0.536]	Yes		0.153	
	H3c	PAC → APC	0.102	0.093	n.s.	0.413	[-0.127; 0.302]	No		0.010	
	H1	APC → BI	0.386	0.093	4.104***	<0.001	[0.180; 0.609]	Yes	0.491	0.236	0.407
	H2b	SN → BI	0.446	0.093	4.780***	<0.001	[0.186; 0.667]	Yes		0.321	
	H2a	PBC → BI	0.044	0.085	n.s.	0.603	[-0.175; 0.256]	No		0.004	

Table 5: Assessment of the multi-group analyses

	Hypothesis	Path	Std Beta (With avocado oil)	Std Beta (Paraben free)	Std Beta Difference	Permutation p-value
The claims focus on consumer health	H4	CR → AFRC	0.487	0.547	-0.06	0.082
	H5	AFRC → APC	0.581	0.627	-0.046	0.098
	H3b	HC → APC	0.202	0.280	-0.078	0.068
	H3a	EC → APC	0.036	0.073	-0.037	0.679
	H3c	PAC → APC	0.021	0.098	-0.077	0.065
	H1	APC → BI	0.415	0.411	0.004	0.927
	H2b	SN → BI	0.459	0.527	-0.068	0.086
	H2a	PBC → BI	0.143	-0.020	0.163	0.028
	Hypothesis	Path	Std Beta (With recyclable plastic)	Std Beta (Reduced environmental impact)	Std Beta Difference	Permutation p-value
The claims focus on the environment	H4	CR → AFRC	0.563	0.668	-0.105	0.049
	H5	AFRC → APC	0.543	0.596	-0.053	0.097
	H3b	HC → APC	-0.030	-0.040	0.01	0.895
	H3a	EC → APC	0.283	0.305	-0.022	0.863
	H3c	PAC → APC	-0.030	0.102	-0.132	0.042
	H1	APC → BI	0.203	0.386	-0.183	0.015
	H2b	SN → BI	0.648	0.446	0.202	0.008
	H2a	PBC → BI	0.131	0.044	0.087	0.054