The Impact of Overpackaging's Elimination on Consumers' Purchase Intention: The Mediating Effect of Brand Image and Brand Ecological Image

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Dissertation submitted in partial fulfilment of requirements for the MSc in Management with Specialization in Strategic Marketing at Universidade Católica Portuguesa, April 2021.

ABSTRACT

Title: The Impact of Overpackaging's Elimination on Consumers' Purchase Intention: The Mediating Effect of Brand Image and Brand Ecological Image

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With society's growing concern for sustainability, consumers are more aware than ever about the impact of their choices on the environment, thus changing their needs and buying behavior. This way, companies are being pressured to adapt to this evolving trend and find their way through this segment. Given the relevance that packaging has as a communication tool, the development of sustainable packaging may be an efficient way to convey environmental efforts.

This research aims to understand the impact that overpackaging's elimination has on consumers' purchase intention in the yogurt category, as well as the mediating role that perceived brand image and brand ecological image have in this relationship.

In order to gather information, an online survey was conducted, in which respondents were random and evenly exposed to one of six possible scenarios, varying in brand and level of overpackaging. These stimuli were created and improved through a pre-study, consisting of individual interviews, followed by a pilot test to assure the survey's full comprehension.

The obtained results suggest that consumers' purchase intention is, indeed, influenced by the level of overpackaging. Additionally, while brand ecological image has proven to mediate the relationship between the level of overpackaging and purchase intention, brand image has not. However, findings have indicated that there is a sequential mediation, meaning that the absence of overpackaging positively impacts brand ecological image, which enhances brand image, thus increasing purchase intention.

Keywords: Overpackaging, Sustainability, Purchase Intention, Brand Image, Brand Ecological Image, Environmental Consciousness

SUMÁRIO

Título: O Impacto da Eliminação de Embalagens Excessivas na Intenção de Compra dos Consumidores: O Efeito Mediador da Imagem de Marca e da Imagem Ecológica de Marca

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Com a crescente preocupação da sociedade por sustentabilidade, os consumidores estão mais conscientes que nunca acerca do impacto das suas escolhas no ambiente, alterando as suas necessidades e atitudes de compra. Assim, as empresas estão a ser pressionadas para se adaptarem a esta tendência e encontrarem a sua posição neste segmento. Devido à relevância das embalagens na comunicação das marcas, a criação de embalagens sustentáveis poderá ser um modo eficaz para transmitir esforços ambientais.

Este estudo visa compreender o impacto da eliminação de embalagens excessivas na intenção de compra de iogurtes, bem como o efeito mediador que a imagem de marca e a imagem ecológica de marca têm nesta relação.

Na recolha de informação, um questionário foi conduzido *online*, no qual os participantes foram expostos a um de seis cenários, variando em marca e nível de excesso de embalagem. Estes estímulos foram criados e melhorados através de um estudo prévio, consistindo em entrevistas individuais, seguido de um teste piloto para assegurar a total compreensão do questionário.

Os resultados obtidos sugerem que a intenção de compra é, de facto, influenciada pelo nível de excesso de embalagem. Adicionalmente, enquanto a imagem ecológica de marca mostrou ser um mediador nesta relação, tal não ocorreu no caso da imagem de marca. No entanto, o estudo indica que existe uma mediação sequencial, o que significa que a ausência de excesso de embalagem impacta positivamente a imagem ecológica de marca, elevando a imagem de marca e, por sua vez, aumentando a intenção de compra.

Palavras-Chave: Embalagem Excessiva, Sustentabilidade, Intenção de Compra, Imagem de Marca, Imagem Ecológica de Marca, Consciência Ambiental

ACKNOWLEDGEMENTS

First and foremost, I would like to express my deep gratitude to Professor Paulo Romeiro for all the patience, support and encouragement. His constant availability was essential to complete this dissertation, the final stage of my master's degree. I would also like to thank Professor Daniel Fernandes for his valuable feedback, advice and suggestions.

To my family, my sincerest "thank you" for everything they have taught me, for always believing in me and for encouraging me to do what I love. Mom, Dad, Tomás, Gonçalo and Eulália, I can't put into words how grateful I am for being a part of such a wonderful family.

Last but not least, I would like to thank my amazing friends for their unconditional support and constant motivation. A special thank you to Joana Duarte, who has always been there for me throughout this five-year journey at Católica-Lisbon.

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GLOSSARY

RQ	Research Question
FMCG	Fast-Moving Consumer Goods
SPSS	Statistical Package for the Social Sciences
OP	Overpackaging
Non-OP	Non-Overpackaging
X	Independent Variable
Y	Dependent Variable
M	Mediator
IE	Indirect Effect
CI	Confidence Interval
PI	Purchase Intention
BI	Brand Image
BEI	Brand Ecological Image

CHAPTER 1: INTRODUCTION

1.1 Background

With society's growing concern for the environment, consumers are more aware than ever about their choices' impact (Stolz, Molina, Ramírez & Mohr, 2013). In fact, according to Unilever (2017), one third of consumers purchase products based on brands' social and environmental efforts. In other words, the demand for sustainable products has been increasing over the years, which pressures companies to find a way through that market (Islam, Moeinzadeh, Tseng & Tan, 2020) by launching green, sustainable products (Borin, Cerf & Krishnan, 2011; Dangelico & Pujari, 2010).

Given the importance of products' packaging as a communication tool, as well as an essential part of the brand itself (Rettie & Brewer, 2000), it is crucial for companies to adapt this element to the customers' changing needs when it comes to environmentally sustainable products, which could be accomplished through the elimination of overpackaging. While two types of packaging are usually distinguished - primary and secondary - with, respectively, containing and grouping functions (Monnot & Reniou, 2012), a third one must be mentioned and differentiated from the previous ones as it is considered to be superfluous, avoidable and non-vital for the product (Elgaaïed-Gambier, 2016). In other words, any packaging that does not assure neither containing nor grouping functions can be considered as overpackaging, which is not considered to be a sustainable practice. Hence, as consumers are demanding for more environmentally friendly packaging (Prendergast & Pitt, 1996), overpackaging may lead them to avoid the brand, thus eventually hurting it (Chen, Hung, Wang, Huang & Liao, 2017). In fact, according to Silayoi and Speece (2007), sustainable packaging is considered to have an impact on customers' choices.

Several studies suggest that, while consumers associate overpackaging with higher perceived product quality, convenience, attractiveness and protection, its absence is highly perceived as a more environmentally friendly and economical practice (Elgaaïed-Gambier, 2016; Monnot, Parguel & Reniou, 2015). However, other researches state that non-overpackaging will not compromise consumers' perceptions regarding the products' quality and attractiveness (Prendergast & Pitt, 1996). In fact, Cho (2015) even showed that consumers' evaluations and attitudes towards a brand may be affected by its sustainability claims, influencing crucial consumer outcomes such as purchase intention and willingness to pay a premium.

Taking into account the presented ideas, the aim of this research is to understand how the absence and presence of overpackaging influence consumers' purchase intention, as well as assess the role that perceived brand image and brand ecological image have in this relationship.

1.2 Problem Statement

The scope of this research is to understand how a more sustainable packaging in the yogurt category would influence consumers' purchase intention, as well as the mediating effect of their perceived brand image and brand ecological image in this relationship. In other words, this study's problem statement can be defined as:

How does the level of overpackaging (present vs. absent) influence consumers' purchase intention and companies' brand image and brand ecological image?

This way, the problem statement can be translated into the following research questions:

RQ1: Does the elimination of overpackaging impact consumers' purchase intention?

RQ2: Do brand image and brand ecological image have a mediating role in the relationship between the elimination of overpackaging and consumers' purchase intention?

1.3 Relevance

The environmental deterioration that is lived nowadays has led not only to consumers' significant increase in environmental concerns and awareness about their choices' impact (Kautish, Paul & Sharma, 2019), but also to a change in their needs (Scott & Vigar-Ellis, 2014). This way, as previously mentioned, companies and marketers are constantly being challenged and pressured to adapt their strategies to these changing concerns (Islam et al., 2020). Having this said, since "the impact of packaging on the environment is gaining increasing recognition from consumers" (Prendergast & Pitt, 1996), the development of a more sustainable packaging through the elimination of overpackaging could be a solution for companies to find their position in this recent market.

Academically, this study is of great relevance given that, even though several research on packaging and sustainability has already been conducted, there is still a gap to be filled on the topic of overpackaging and the potential influence that its absence may have on consumers' buying behavior and brand perceptions. Therefore, this concept's analysis within the yogurt

category can pave the way for further research in different categories or even with other relevant variables in the conceptual model.

When it comes to the managerial relevance, as previously mentioned, due to the growing concern for the environment, consumers are more aware and demanding than ever for sustainable products, leading companies to try to find their way through that market. Thus, this study can provide companies and marketers with insightful results since the elimination of overpackaging would benefit the environment, increase consumers' purchase intention and improve brands' image while reducing companies' expenses in packaging materials.

In other words, this study's overall goal is to shed a new light on the concept of overpackaging and understand whether this sustainable solution would be viable for both consumers and companies.

1.4 Research Methods

While gathering information so that the research questions could be answered, both secondary and primary data were used. When it comes to the secondary data, existing literature was researched through journals, books and academic articles in order to provide a context for this study, collect information on its most relevant variables (purchase intention, overpackaging, brand image and brand ecological image), better define the problem statement and properly design the primary data collection process. Additionally, this research was also helpful while deciding which FMCG category and brands would be most suitable for this study.

Moreover, both qualitative and quantitative methods were applied during the primary data gathering. Initially, while creating the online questionnaire, individual interviews were conducted to guarantee the respondents' perceptions towards the questionnaire's six different scenarios, followed by a pilot test when the survey was completed in order to ensure its full comprehension. This way, crucial qualitative information was obtained and used to make several improvements, after which the survey was finally released and distributed online. In this quantitative method, the influence that overpackaging and its absence have on respondents was studied by randomly exposing them to six different scenarios and assessing their purchase intention, perceived brand image and brand ecological image. The obtained results were, then, analyzed through IBM's SPSS statistical software, version 26, by performing tests to the data's reliability, frequencies and descriptive statistics, as well as non-parametric and mediation

analyses. All this culminated in the fifth chapter, where conclusions about the research questions were drawn.

1.5 Dissertation Outline

This dissertation is organized in a total of five chapters, being this the first one, where the problem statement and research questions are introduced. The following chapter contains the literature review, which focuses on the analysis of previous academic research and existing literature with the purpose of exploring how relevant each variable is for consumers' purchase intention, as well as providing a context for the research questions and consequent hypotheses that will guide this study. Moreover, the third chapter presents the research methodology, aiming to clarify and describe the different techniques used to collect and analyze the data, as well as how each statistical test and construct were, respectively, conducted and applied in order to answer the research questions and validate the formulated hypotheses. Chapter four comprises the explanation and analysis of the results obtained from the gathered data, verifying the legitimacy of each proposed hypothesis. Finally, the fifth chapter concludes the dissertation, contemplating its main findings, limitations and recommendations for future research to be conducted on this topic, as well as this study's managerial and academic implications.

CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

The following chapter will focus on the analysis of previous academic researches and existing literature with the purpose of exploring each relevant variable for this study and providing a context for the research questions and consequent hypotheses. Therefore, this section will explore four main variables: purchase intention, overpackaging, brand image and brand ecological image.

2.1 Purchase Intention

This variable can be described as "consumers' personal action tendencies related to a certain brand" (Bagozzi, Tybout, Graig & Sternthal, 1979). In addition, Morrison (1979) designates purchase intention as the probability of a shopper to choose to buy a good. This concept can also be defined as "an individual's conscious plan to make an effort to purchase a brand" (Spears & Singh, 2004).

Purchase intention is acquired through experience when a product, performance or behavior is positively or negatively reinforced (Bagozzi et al., 1979). Furthermore, it is highly associated with whether consumers believe that the product will fulfill their desires and needs (Kupiec & Revell, 2001). This concept covers a broad range of products and services and is regularly applied in consumer research investigations, such as new product concept tests (Kalwani & Silk, 1982).

Several articles and researches have applied purchase intention as a key construct to predict actual purchase behaviors, constituting a resourceful theoretical support (Kalwani & Silk, 1982). According to Chang and Wildt (1994), since purchase intention is created under the idea of a forthcoming transaction, it is often an important indicator of actual purchases. Thus, this study will treat purchase intention as a predictor of consumers' actual buying behavior.

2.2 Packaging

A product's packaging fulfills both technical and marketing purposes, being its primary function to protect and contain the product, followed by the package's ability to attract customer attention to the product and reinforce its image (Prendergast & Pitt, 1996). It is a part of the product and the brand by expressing its attributes and affecting its image (Chen et al., 2017).

Packaging is also considered as a “silent salesman” (Ford, Moodie & Hastings, 2012) as consumers are exposed to the product’s packaging in the store before they can directly experience its consumption or use. This element becomes an ultimate selling tool that encourages impulsive buying behaviors, increasing sales and market share while reducing marketing and promotional costs (Raheem, Vishnu & Ahmed, 2014).

Two types of packaging are generally distinguished: primary and secondary. Primary packaging refers to the material that first surrounds the product and is usually in direct contact with the content. Secondary packaging, on the other hand, is outside the primary packaging and is used to gather several units of primary packages (Monnot & Reniou, 2012).

2.2.1 *Overpackaging*

While, as previously mentioned, primary and secondary packaging have, respectively, containing and grouping functions, overpackaging is a third category (Monnot & Reniou, 2012) and must be clearly differentiated from both previous types as it is considered to be superfluous, avoidable and non-vital for the product (Elgaaïed-Gambier, 2016).

In some cases, the term *overpackaging* is also used to describe a primary or a secondary packaging that is inappropriately large for the amount of product it contains. However, this specific type of excess packaging refers to oversized packaging rather than the genuine term of overpackaging (Elgaaïed-Gambier, 2016). Thus, it is important to mention that this research focuses exclusively on packages that have neither a containing nor a grouping function.

Previous research has demonstrated that consumers use packaging features as extrinsic cues to assess products and that overpackaging is one of these indicators used to determine their preference (Monnot, Reniou, Parguel & Elgaaïed-Gambier, 2019).

Several studies suggest that the mere presence of overpackaging can be associated with higher perceived product quality as well as ease of transportation, consumption or use, while its absence can be attributed to a more environmentally friendly or economical product (Monnot et al., 2015). In fact, since overpackaging is not considered to be a sustainable practice, it may lead environmentally conscious consumers to avoid that brand, which will eventually hurt it (Chen et al., 2017).

While most consumers perceive overpackaging as being associated with top-of-the-line, premium brands that present better protection, higher quality and attractiveness, others

associate it with additional costs - the use of excessive raw materials generates costs for manufacturers, which will likely affect the final selling price and, consequently, dissuade those who do not see utility in overpackaging. When it comes to the types of food that consumers associate the most with overpackaging, the categories that stand out are: yogurts, vegetables, fruits, cheese and cookies (Elgaaïed-Gambier, 2016).

Consumers may have different points of view when it comes to overpackaging: some of them are indifferent, some have strong positions about it, being either very favorable or very hostile, and others are faced with an ethical dilemma based on the trade-off between perceived quality and sustainability (Elgaaïed-Gambier, 2016). These individuals can either decide based on morality or take a rational approach to maximize their benefits, which is in line with McCullough and Faught's (2005) research.

As previously mentioned, consumers are increasingly demanding more environmentally friendly packaging in terms of reduced packaging or packaging that can be recycled or reused (Prendergast & Pitt, 1996). In fact, most of them are aware that overpackaging is harmful to the environment due to the pollution generated by the increase in the volume of waste (Elgaaïed-Gambier, 2016). In this context, retailers can present the elimination of overpackaging as a way of reducing the amount of waste and making its disposal easier for consumers, who would no longer have to deal with this unnecessary packaging (Monnot et al., 2015).

When faced with the concept of overpackaging elimination, there are different points of view on consumers' responses that must be addressed. These perceptions are mostly related to the packaged products' quality, expensiveness, convenience and attractiveness.

According to Prendergast & Pitt (1996), creating a more environmentally friendly package would not necessarily affect its attractiveness to consumers or make it more difficult to protect and handle the product, meaning that their perceptions regarding the products' quality and attractiveness would not be compromised.

On the other hand, more recent studies have shown that, while eliminating overpackaging does increase the consumers' perceived environmental friendliness, it reduces the product's perceived expensiveness and convenience (Monnot et al., 2015).

Several researchers also suggest that the influence of eliminating overpackaging on purchase intention can be both moderated and mediated by several factors. According to Monnot et al.

(2015), this relationship is mediated by perceived quality and convenience, meaning that the consumers' beliefs regarding these attributes after the elimination of overpackaging have an impact on their purchase intention. Elgaaïed-Gambier (2016), on the other hand, showed that consumers are more likely to privilege non-overpackaged products when they are dealing with premium brands and when their attention is drawn towards the absence of overpackaging. Other authors even revealed that the elimination of overpackaging only reduces purchase intention when consumers are not environmentally conscious nor involved with the purchase and face overpackaged competing products. However, when consumers face non-overpackaged competing products, the absence of overpackaging has no negative impact on purchase intention (Monnot et al., 2019). In other words, these researchers suggest that the impact of overpackaging on purchase intention is moderated by consumers' environmental consciousness and store shelf context. In addition, according to Elgaaïed-Gambier (2016), younger consumers would be more willing to give up their own convenience to preserve the environment, suggesting that certain demographic elements also affect this relationship.

Given the increasing concern that both companies and consumers have been demonstrating for the environment, always looking for improved and sustainable practices, the following hypothesis has been formulated:

H_1: Non-overpackaged products have a higher purchase intention than overpackaged products.

2.3 Brand Image

Brand image is the existing perception of the brand in the minds of consumers or other stakeholders (Laidler-Kylander, Quelch & Simonin, 2007), which results from their interpretation of brand identity (Keller, 1993). It is also considered as "the understanding consumers derive from the total set of brand-related activities engaged by the firm" (Park, Jaworski & Maclnnis, 1986).

According to Keller (1993), brand image is the reflection of brand associations and perceptions held in consumers' memories, including perceptual beliefs about a brand's attributes, benefits and attitude associations, which are frequently considered the basis for an overall assessment or attitude towards the brand.

Furthermore, it is considered as one of the components of brand equity, which is a behaviorally oriented construct influenced by consumers' image and attitude towards brands. Hence, the

favorability, strength and uniqueness of brand associations play an important role in determining brand equity, especially in high involvement decision settings (Keller, 1993).

Bengtsson and Firat (2006) state that all consumers who are aware of a brand have an image of that brand, which can be influenced by certain associations. Thus, a brand image should be created in order to establish an emotional relationship with the consumers, thus captivating them (Ghodeswar, 2008).

Brand image can, then, be defined as a universal construct formed by an aggregate of all the associations related to a brand (Keller, 1993). Moreover, Elgaaïed-Gambier (2016) showed that consumers are more likely to privilege non-overpackaged products when they are dealing with premium brands. Thus, this study predicts that, for both Danone and Mimosa, consumers' perceived image will be higher when dealing with non-overpackaged products rather than overpackaged products.

H_2: Non-overpackaged products have a higher brand image than overpackaged products.

Additionally, according to Spears and Singh (2004), consumers' attitudes towards a brand and purchase intention exist as separate but positively correlated dimensions, meaning that brand image positively predicts purchase intention (Yu, Lin & Chen, 2013). Having this said, it is expected that, when facing non-overpackaged products, consumers' perceived brand image will improve, consequently increasing their purchase intention.

H_3: Brand image mediates the relationship between overpackaging elimination and consumers' purchase intention.

2.4 Brand Ecological Image

Brand ecological image, or green brand image, refers to consumers' perceptions of a certain brand regarding its environmental commitments and concerns (Chen, 2010). In other words, it reflects whether consumers perceive the brand to be environmentally sustainable and eco-friendly. According to Ng, Butt, Khong and Ong (2014), this variable constitutes a subset of the overall brand image. However, this study will treat brand image and brand ecological image as separate variables since it is relevant to evaluate the individual role of the later in the relationship between overpackaging and purchase intention.

Chen et al. (2017) consider that, as overpackaging is highly associated with waste and pollution, causing a negative impression on the brand, it is negatively correlated with green brand image. In addition, Ng et al. (2014) state that consumers tend to associate brand ecological image with the companies' claims and commitments towards environmental concerns, as well as the products they offer. This way, and taking into consideration the previously mentioned importance of a product's packaging for the brand, this study expects that overpackaged products will have a lower brand ecological image than non-overpackaged products.

H_4: Non-overpackaged products have a higher brand ecological image than overpackaged products.

When it comes to consumers' willingness and intention to pay for an eco-friendly product, Chen et al. (2017) showed that overpackaging damages companies' green brand image, causing brand avoidance and hurting the brand. This way, they suggest that decreasing overpackaging can help companies increase their brand ecological image, positively affecting consumers' brand attachment and, consequently, their intention to buy a product. Additionally, Chen (2010) supports this theory by stating that consumers are more willing to purchase products that are more environmentally friendly. Therefore, it is expected that, when facing non-overpackaged products, consumers' perceived brand ecological image will improve, thus increasing their purchase intention.

H_5: Brand ecological image mediates the relationship between overpackaging elimination and consumers' purchase intention.

2.5 Conceptual Model

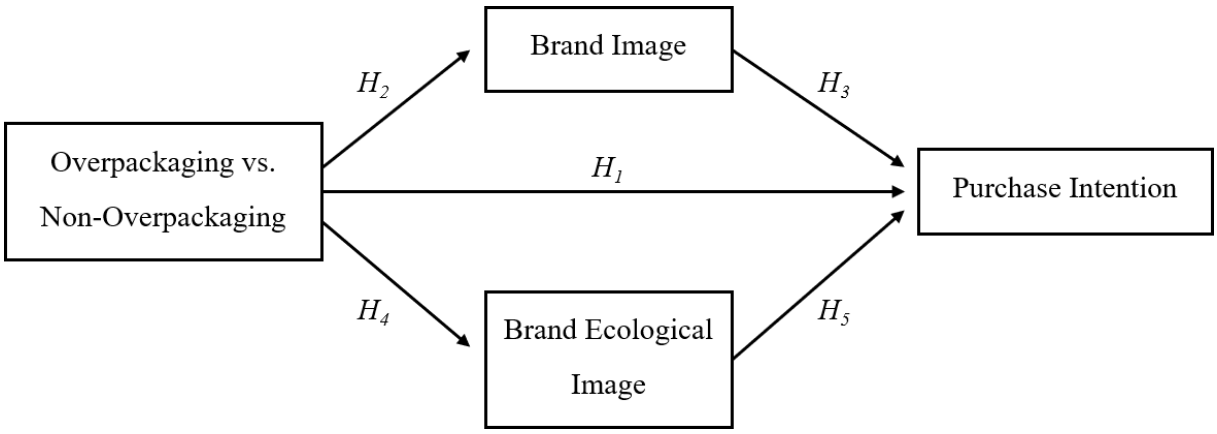

Figure 1: Conceptual Framework

CHAPTER 3: METHODOLOGY

The following chapter presents and explains the methodology used to answer the research questions and reach conclusions about the hypotheses formulated in the previous chapter. Firstly, a description of the research approach will be presented, followed by an analysis of the primary and secondary data collection methods.

3.1 Research Approach

The main goal of this dissertation is to assess the impact that overpackaging and its potential elimination have on consumers' purchase behavior and perception of companies' overall and ecological brand image. However, in order to establish a context for this study, a product category had to be chosen, along with specific brands from that category. Firstly, while researching which FMCG to focus on, it was found that, when it comes to the types of food that consumers associate the most with overpackaging, the categories that stand out are: yogurts, vegetables, fruits, cheese and cookies (Elgaaïed-Gambier, 2016). Due to the high consumption of yogurts in Portugal (Grande Consumo, 2020), this was the selected category for the present study. Furthermore, in order to analyze the role that brand image and brand ecological image have on the relationship between overpackaging and consumers' purchase intention in the yogurt category, it is crucial for the respondents to be exposed to specific yogurt brands. This way, Danone and Mimosa were selected since, according to Grande Consumo (2020), these were the two most consumed brands in January 2020, making them relevant to take into consideration.

In order to answer the research questions and test the validity of the hypotheses, two research methods were employed: exploratory and explanatory. In the Literature Review, through the exploratory method, it was possible to gather insights on the most relevant variables to be examined, provide a context for this study and formulate hypotheses, culminating in the development of the previously presented conceptual framework. Regarding the explanatory method, both qualitative and quantitative data were gathered. Firstly, individual interviews were performed to gather qualitative insights on the questionnaire, as well as a pilot test to guarantee its full comprehension. Then, the online survey was conducted with the purpose of gathering quantitative data, testing the proposed hypotheses and reaching final conclusions.

3.2 Secondary Data

In the elaboration of the Literature Review, secondary data was collected from journals, books and academic articles, which was crucial in clarifying the concepts presented in the conceptual framework, understanding the problem statement, formulating hypotheses and deciding which constructs to use in this study's quantitative data collection. This chapter defines the four main variables presented in the conceptual model – purchase intention, overpackaging, brand image and brand ecological image – and analyses previous academic researches on how they interact among each other. Additionally, the gathered information was helpful in determining which FMCG category would be studied in this research, as well as the proper brands to be considered.

3.3 Primary Data

Once information was gathered through secondary sources, the primary data was collected through qualitative and quantitative approaches in order to understand the influence that the elimination of overpackaging would have on consumers' purchase intention and companies' brand image and brand ecological image.

Firstly, individual interviews were performed in order to assess the respondents' perceptions towards the six different stimuli that were created. This way, the input from 10 responses was considered, leading to several modifications. After altering the stimuli and designing the questionnaire, a pilot test was conducted to ensure the survey's effectiveness and full comprehension. Thus, feedback from 13 responses was taken into consideration and certain adjustments were applied.

Then, the online survey was conducted. While convenient to analyze, low in costs and high in speed and amount of responses, this research approach holds little control over the respondents and their environment, provides no opportunity to clarify questions and may not be representative of the target population (Malhotra & Birks, 2007).

3.3.1 *Online Survey*

The online survey, available both in Portuguese and English and presented in Appendix 1, was created using Qualtrics and has been distributed from the 3rd to the 8th of December 2020 mainly through WhatsApp, Instagram and Facebook. This way, a non-probability sampling technique was used to collect data, namely the convenience one, meaning that the sample was not randomly chosen throughout the population. In this technique, researchers select samples that

are conveniently available among the population, increasing the study's speed and cost-efficiency (Vehovar, Toepoel & Steinmetz, 2016).

When it comes to the target population, it comprised all people who regularly consume yogurts so that this method could gather data from well-informed consumers and generate accurate results. This way, in order to ensure the respondents' compliance with this requirement, a control question was present in the beginning of the questionnaire excluding all participants who had not consumed yogurts in the last year.

The questionnaire's design can be considered cross-sectional, meaning that information was only collected once from the target population, with a 3 (non-overpackaging, control, overpackaging) by 2 (Danone, Mimosa) between-subject model, as portrayed in Figure 2. This way, respondents were even and randomly directed to one of the six possible stimuli that are visually depicted in the questionnaire's script (Appendix 1).

	DANONE	MIMOSA
NON-OVERPACKAGING		
CONTROL		
OVERPACKAGING		

Figure 2: Questionnaire's Stimuli Matrix

While the non-overpackaging scenarios included yogurts without any cardboard around them, the control group was represented by the yogurts that are currently sold, which are covered by a cardboard sleeve. Regarding the overpackaging stimuli, the yogurts were contained in a cardboard box.

As for the questionnaire's flow, it started with a brief introduction, aiming to explain the purpose of the study, ensure the respondents' anonymity and responses' confidentiality, and provide an email contact to clear any doubts that might have arisen. Then, there were four different sections, the first being the previously mentioned control question, which guaranteed the respondents' ability to properly complete the questionnaire by ensuring that they fit in the target population. Moreover, the second block aimed to assess the participants' environmental consciousness by evaluating how their purchase behavior would change when faced with environmentally friendly options. In the third block, respondents were random and evenly

assigned to one of the six different scenarios presented in Figure 2, followed by a series of questions concerning their purchase intention towards the product, perceived brand image and perceived brand ecological image, as well as a section to ensure that they fully comprehended the displayed stimulus. In this manipulation check, participants were asked three questions ("Do you consider that the presented product is using an excessive amount of packaging materials?"; "Do you consider that the presented product is using a normal amount of packaging materials?"; "Do you consider that the presented product is using less packaging materials than usual?"), to which they had to respond either "Yes" or "No". Regardless of the brand, respondents were expected to answer, in order, "No, No, Yes" in the non-overpackaging stimulus, "No, Yes, No" in the control group and "Yes, No, No" in the overpackaging scenario. Even though this was the chosen methodology to guarantee the participants' comprehension of the different stimuli, its complexity may constitute a limitation for this study. Finally, the fourth and last section assessed the respondents' demographic information, encompassing questions about their gender, nationality, age, education, occupation and income.

3.3.2 *Measurement/Indicators*

As previously mentioned in Chapter 2, by researching previous literature, the most appropriate measures for the analysis of this study's main variables were found, culminating in Table 1. This way, the operational model includes all the constructs used to create the survey's questions regarding each variable in study, as well as the respective number of items, scale, author and reliability coefficient.

Measure	Items	Scale	Reference	Cronbach's α
Brand Image	6	7-Point Semantic Differential	(Low & Lamb, 2000)	0,78
Brand Ecological Image	3	7-Point Likert Scale	(Parguel et al., 2015)	0,87
Purchase Intention	4	7-Point Likert Scale (*)	(Vilnai-Yavetz & Koren, 2013)	0,84
Environmental Consciousness	3	7-Point Likert Scale (*)	(Schlegelmilch et al., 1996)	0,82

** These scales were adapted from the original ones, which were 5-Point Likert Scales.*

Table 1: Operational Model

As it is possible to observe from the table above, two of the presented constructs were adapted from their original 5-point scale so that all of them would have the same number of response

alternatives, thus facilitating the statistical analysis. The 7-point scale was the chosen one since it is more accurate, easier to use and constitutes a better reflection of a respondent's true evaluation (Cox III, 1980; Finstad, 2010).

The presented variables were mainly measured with 7-point Likert scales, which assessed the respondents' agreement with several statements, ranging from "Strongly Disagree" to "Strongly Agree". The only construct that did not use this scale was brand image, which was quantified through a 7-point semantic differential scale so that participants would evaluate the brand according to six different attributes.

3.3.3 *Data Analysis*

In order to analyze the quantitative data that was gathered in the online survey, IBM's software - the Statistical Package for the Social Science (SPSS), version 26 – was used. The purpose of this procedure was to confirm the proposed hypotheses and assess the statistical significance of the variables' interactions.

Firstly, respondents' demographic information was analyzed through the generation of descriptive statistics and frequencies, allowing to characterize and have an overview of the total sample. Then, to guarantee the study's viability, each construct's degree of reliability was tested by calculating Cronbach's Alphas. Moreover, a normality test was conducted to assess whether the gathered data was normally distributed, followed by an overview of the most relevant descriptive statistics so that it would be easier to understand and visualize the final results.

When it comes to the actual hypotheses' results, the significance level was considered to be 5% for every statistical test. After verifying all the required assumptions, several non-parametric analyses, namely Kruskal-Wallis H and Mann-Whitney U, were performed to assess whether there were statistically significant differences in purchase intention, brand image and brand ecological image among the six scenarios that were displayed to the respondents. In addition, Hayes' PROCESS macro was used to estimate the indirect impact that the independent variable had on purchase intention through brand image and brand ecological image (Hayes, 2018). As these two mediators were tested individual and sequentially, PROCESS' models 4 and 6 were both executed.

CHAPTER 4: RESULTS AND DISCUSSION

This chapter presents a detailed analysis of the quantitative data gathered in the online questionnaire. Firstly, a characterization of the overall sample will be made, followed by a reliability test for the measurement constructs, ending in the hypotheses' tests and respective statistical results. This analysis is based on the previously mentioned methodology and will lead to conclusions regarding the research questions proposed in the first chapter of this dissertation.

4.1 Sample Characterization

From a total of 521 completed answers, 37 of them were excluded for not complying with the control question, 80 for failing the manipulation check and 21 for being considered outliers by the Mahalanobis Distance test, yielding 138 excluded responses. The remaining 383 valid responses are presented below, along with their demographic characterization.

		Danone, Control	Danone, Non-OP	Danone, OP	Mimosa, Control	Mimosa, Non-OP	Mimosa, OP	Total
Responses	Total	53	66	76	63	58	67	383
	Total (%)	13,8%	17,2%	19,8%	16,5%	15,2%	17,5%	100%
Gender	Male	30,2%	34,8%	22,4%	30,2%	27,6%	23,9%	27,9%
	Female	69,8%	65,2%	77,6%	69,8%	72,4%	76,1%	72,1%
Age	Under 18	1,9%	1,5%	1,3%	3,2%	0,0%	0,0%	1,3%
	18 - 24	71,7%	53,0%	60,5%	84,1%	62,1%	64,2%	65,5%
	25 - 34	9,4%	13,6%	11,8%	4,8%	15,5%	9,0%	10,7%
	35 - 44	0,0%	3,0%	5,3%	0,0%	1,7%	6,0%	2,9%
	45 - 54	9,4%	18,2%	7,9%	3,2%	10,3%	13,4%	10,4%
	55 - 64	5,7%	10,6%	13,2%	4,8%	8,6%	6,0%	8,4%
	65 - 74	1,9%	0,0%	0,0%	0,0%	1,7%	1,5%	0,8%
	75 - 84	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
	Over 85	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%	0,0%
Nationality	Portuguese	92,4%	92,4%	94,7%	92,0%	96,6%	91,0%	93,2%
	Other	7,6%	7,6%	5,3%	8,0%	3,4%	9,0%	6,8%

		Danone, Control	Danone, Non-OP	Danone, OP	Mimosa, Control	Mimosa, Non-OP	Mimosa, OP	Total
Education	Under High School	0,0%	0,0%	1,3%	4,8%	0,0%	0,0%	1,0%
	High School	18,9%	12,1%	13,2%	17,5%	20,7%	20,9%	17,0%
	Bachelor's	50,9%	57,6%	52,6%	54,0%	44,8%	44,8%	50,9%
	Master's	28,3%	28,8%	30,3%	23,8%	34,5%	26,9%	28,7%
	PhD	1,9%	1,5%	2,6%	0,0%	0,0%	7,5%	2,3%
Occupation	Student	39,6%	45,5%	39,5%	50,8%	31,0%	44,8%	42,0%
	Student-Worker	17,0%	12,1%	14,5%	11,1%	15,5%	6,0%	12,5%
	Employed	34,0%	40,9%	42,1%	33,3%	50,0%	40,3%	40,2%
	Unemployed	7,5%	1,5%	3,9%	4,8%	1,7%	6,0%	4,2%
	Retired	1,9%	0,0%	0,0%	0,0%	1,7%	3,0%	1,0%
Income	< €10,000	13,2%	10,6%	11,8%	11,1%	8,6%	6,0%	10,2%
	€10,000-€39,999	35,8%	24,2%	30,3%	36,5%	39,7%	28,4%	32,1%
	€40,000-€69,999	22,6%	25,8%	21,1%	22,2%	20,7%	31,3%	24,0%
	€70,000-€99,999	13,2%	13,6%	17,1%	11,1%	10,3%	10,4%	12,8%
	€100,000-€149,999	5,7%	10,6%	9,2%	7,9%	20,7%	9,0%	10,4%
	> €150,000	9,4%	15,2%	10,5%	11,1%	0,0%	14,9%	10,4%
Cons. Habits	Daily	22,6%	27,3%	27,6%	25,4%	31,0%	23,9%	26,4%
	Weekly	39,6%	42,4%	47,4%	30,2%	32,8%	38,8%	38,9%
	Monthly	24,5%	21,2%	13,2%	33,3%	22,4%	16,4%	21,4%
	Quarterly	5,7%	4,5%	6,6%	6,3%	5,2%	14,9%	7,3%
	Every six months	7,5%	3,0%	3,9%	1,6%	3,4%	4,5%	3,9%
	Annually	0,0%	1,5%	1,3%	3,2%	5,2%	1,5%	2,1%

Table 2: Sample Characterization

Even though, as previously mentioned, Qualtrics' randomization functionality has been used, the failed manipulation checks unbalanced the number of answers per stimulus. Nevertheless, it was still an approximately even distribution.

As it would be expected due to the distribution channels used to share the survey, most respondents were Portuguese females with ages ranging between 18 and 24 years old.

4.2 Reliability Measurement

Even though all the presented constructs were obtained through previously tested literature, it is still important to guarantee the study's viability by checking its variables' reliability and

consistency. Thus, a Cronbach's Alpha test was conducted for the following variables: environmental consciousness, purchase intention, brand image and brand ecological image.

Firstly, this coefficient was individually calculated for each construct within each stimulus, which can be observed in Appendix 2. Moreover, the constructs' total Cronbach's Alpha is presented in the table below and was computed through an average of the variable's coefficient within each stimulus.

Construct	Number of Items	Total Cronbach's Alpha
Environmental Consciousness	3	0,693
Purchase Intention	4	0,846
Brand Image	6	0,849
Brand Ecological Image	3	0,871

Table 3: Constructs' Total Cronbach's Alphas

According to George & Mallery's (2003) scale for this coefficient's level of quality, cited by Gliem & Gliem (2003), it is possible to assess that purchase intention, brand image and brand ecological image are all considered good constructs.

When it comes to environmental consciousness, it is possible to observe that its Cronbach's Alpha is below the acceptable threshold of 0,70. This way, a reliability analysis was made in order to assess whether the removal of one item from this construct would have a considerable impact in the improvement of this coefficient, which proved not to be significant. Hence, this construct's number of items and respective Cronbach's Alpha remained unaltered. Even though a solution to correct this coefficient has not been found, according to van Griethuijsen et al. (2015), if the number of items in a construct is low, values equal to or larger than 0,60 are still admissible. Therefore, this construct can be acceptable for this study.

4.3 Results from the Hypotheses' Testing

In order to test the hypotheses that were previously proposed in chapter 2, several statistical tests were performed in SPSS, as well as mediation models with the PROCESS Macro. It is also relevant to mention that the level of significance used was 5%.

A preliminary analysis was conducted to assess whether the gathered information followed a normal distribution. Thus, a normality test (Appendix 3) was performed, yielding a p-value

lower than 0,05, which means that, while performing statistical tests, the data should be treated as non-parametric.

This way, so that it would be possible to perform non-parametric tests, several assumptions had to be verified. Since the only tests performed in this study are the Mann-Whitney U and Kruskal-Wallis H tests, which require the same assumptions, this confirmation will apply to all the tests presented from now on.

Firstly, the dependent variable should be quantified at the ordinal or continuous level. Given that, in this case, purchase intention is measured through a Likert scale of agreement, it can be considered an ordinal variable, thus verifying this assumption.

Secondly, the independent variable should consist of two (Mann-Whitney U) or more (Kruskal-Wallis H) categorical, independent groups. Since these variables will be mostly related to stimuli groups that fulfill both conditions, this assumption is also validated.

In the third assumption, the independence of observations is required, meaning that there should not be a relationship between the responses in each group or between the groups themselves. As the online survey was distributed to different people, randomly assigning them to different stimuli, there is an independence of observations, thus fulfilling this requirement.

Lastly, in order to compare the medians of the dependent variable for the different groups of the independent variable, the distribution in each group should have the same shape and variability. However, since the main goal of this analysis is to solely compare means and mean ranks, this assumption is not relevant to this case.

After verifying these assumptions, it is now possible to proceed to the data analysis and hypotheses testing.

4.3.1 *Descriptive Statistics*

Firstly, an overview of the most relevant descriptive statistics will be presented so that it is easier to understand and visualize the results from the hypotheses' testing.

When it comes to discrepancies in the variables' means among the different types of groups regardless of the brand, it is possible to observe in the table below that, even though brand image barely differs from group to group, the means for every presented variable are highest in

the non-overpackaged product, followed by the control group and, only then, by the overpackaged product. In Appendix 4, it is possible to observe this data in more detail.

	Purchase Intention	Brand Image	Brand Ecological Image
Control	4,7198	5,1911	4,1695
Non-OP	5,0504	5,2715	4,2392
OP	4,2535	5,1259	3,8974

Table 4: Variables' Means within each Stimulus Group

As previously mentioned in chapter 3, the choice criteria for the studied brands - Danone and Mimosa - was their high consumption in Portugal so that the study could have more credibility and more easily transpose its conclusions for the yoghurt category. This way, it was anticipated that these brands would both have high purchase intention and brand image, meaning that they were not expected to be different from each other. Hence, this will be the only section mentioning the difference between brands.

By looking at Table 5, which can be found in more detail in Appendix 5, when comparing each stimulus' variables between Danone and Mimosa's groups, it is possible to assess that, while brand image and brand ecological image seem to be fairly similar, the respondents' purchase intention looks quite different between brands. This way, three Kruskal-Wallis H tests (Appendix 6) were performed to assess these differences, showing that the means only significantly differ for purchase intention in all the three groups ($p < 0,05$ for control and non-overpackaging; $p < 0,01$ for overpackaging), as well as for brand ecological image in overpackaging ($p < 0,05$). This suggests that purchase intention is always superior for Danone and that this brand has a higher brand ecological image than Mimosa in the overpackaged product.

	Purchase Intention	Brand Image	Brand Ecological Image
Danone, Control	4,9575	5,2579	4,1824
Danone, Non-OP	5,2803	5,2955	4,3030
Danone, OP	4,5362	5,2237	4,0746
Mimosa, Control	4,5198	5,1349	4,1587
Mimosa, Non-OP	4,7888	5,2443	4,1667
Mimosa, OP	3,9328	5,0149	3,6965

Table 5: Variables' Means within each Brand's Stimulus Group

In addition, it is still important to verify whether there is a difference in means within each brand's variables to check if the information from Table 4 can apply to both brands. This way, from the analysis of Table 5, it is possible to draw the same conclusions as in the previous table: in each of the six stimuli, non-overpackaging and overpackaging yielded the highest and lowest means, respectively.

After this general overview of the gathered data, hypotheses' tests must still be performed in order to check the statistical relevance in these means' differences, as well as potential mediating effects.

4.3.2 *Hypothesis 1: Non-overpackaged products have a higher purchase intention than overpackaged products*

In order to verify whether non-overpackaged products are preferred over the others regardless of the brand, it was necessary to compare the means of each group's purchase intention. Hence, a Kruskal-Wallis H test was performed, where the dependent variable was purchase intention and the grouping variable included the three stimuli categories that are being studied: control, non-overpackaging and overpackaging.

The results of this test (Appendix 7) show that there is a statistically significant difference in purchase intention among the three different products ($p < 0,001$), with a mean rank purchase intention of 195,91, 226,68 and 158,76 for the control, non-overpackaged and overpackaged groups, respectively. Even though this test has proven to be statistically significant, it is still important to compare the purchase intention group by group. Thus, three Mann-Whitney U tests were performed in order to assess where the main differences lie (Appendix 8).

In the first table, the control is compared to non-overpackaging, proving that these groups have statistically different means from each other ($p < 0,05$). However, out of the three tests that were performed, this was the least significant one. The second test, referring to the control group and overpackaging, also proved to be statistically significant ($p < 0,01$), showing a larger difference in means than the previous one. Finally, the comparison between non-overpackaging and overpackaging demonstrated the highest statistical disparity in means ($p < 0,001$), which was already expected given the large difference between these stimuli.

This way, it is possible to infer that overpackaged products have the lowest purchase intention among the respondents, followed by the control group and non-overpackaged products, thus **validating hypothesis 1**.

4.3.3 *Hypothesis 2: Non-overpackaged products have a higher brand image than overpackaged products*

To test this hypothesis, a Kruskal-Wallis H test was performed, where the dependent variable was brand image and the grouping variable included the 3 stimuli categories that are being studied. As it is possible to observe in Appendix 9, this test revealed to be statistically insignificant ($p > 0,05$), meaning that this variable's mean does not change between groups, which was already expected from the previously presented descriptive statistics. Hence, this analysis led to the **rejection of hypothesis 2**.

4.3.4 *Hypothesis 3: Brand image mediates the relationship between overpackaging and consumers' purchase intention*

With the aim of studying the mediation effect of brand image on the relationship between overpackaging and purchase intention, PROCESS' model 4 was used, consisting of a simple single mediator analysis. Even though the gathered information is non-parametric and mediation models consist of multi-linear regressions, which require the variables to be parametric, PROCESS was still used in this case since SPSS cannot perform linear regressions in non-parametric data. This model's output can be found in Appendix 10.

Paths a and b represent the effect of overpackaging on brand image and the effect of brand image on purchase intention, respectively. Since the independent variable is multicategorical, it was coded into X_1 (overpackaging vs. non-overpackaging) and X_2 (overpackaging vs. control).

The figure presented below demonstrates that, as it would be expected from the results of hypothesis 2, brand image does not have a mediating effect on the relationship between overpackaging and purchase intention. This can be observed in the overall model's statistical insignificance ($R^2 = ,0028$; $p > 0,05$), as well as in the absence of differences in means for both X_1 and X_2 ($p > 0,05$).

In addition, even though path c and path c' are both statistically significant, there is barely a difference between them (95% CI_1 = [-0,0414, 0,1692]; 95% CI_2 = [-0,0831, 0,1393]). This way, and despite the fact that b-path proved to be statistically significant, meaning that brand image and purchase intention are positively correlated ($b = 0,3759$; $p < 0,001$), **hypothesis 3 is not verified**.

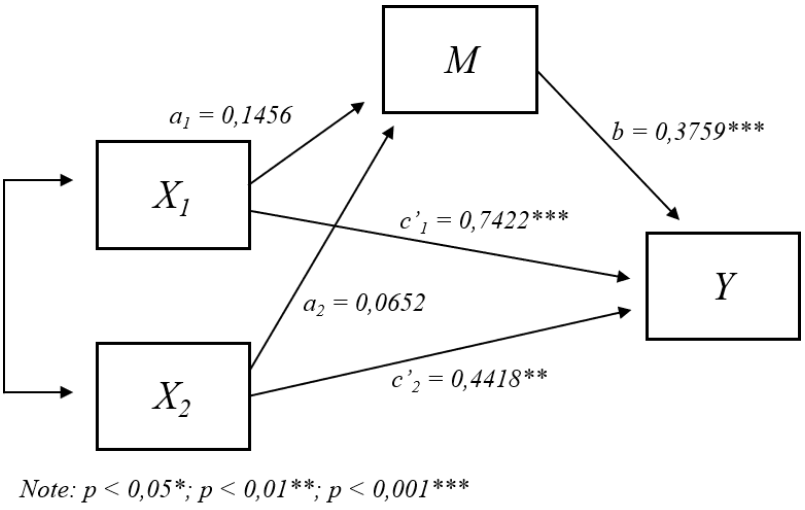

Figure 3: Statistical Model with Coefficients (H_3)

4.3.5 *Hypothesis 4: Non-overpackaged products have a higher brand ecological image than overpackaged products*

To check whether there is a difference in ecological brand image between overpackaged and non-overpackaged products regardless of the brand, a Kruskal-Wallis H test was conducted, comparing this variable's means among the different groups. In this case, the dependent variable was brand ecological image, while the grouping variable included the 3 stimuli categories that are being studied.

The results (Appendix 11) suggest that there is a statistically significant difference in brand ecological image between the three different products ($p < 0,01$), with a mean rank of 201,59, 210,40 and 168,27 for the control, non-overpackaged and overpackaged products, respectively. Nevertheless, it is still relevant to study how different each stimulus is from the others, thus leading to the execution of three separate Mann-Whitney U tests.

In Appendix 12, when comparing the control group with non-overpackaging, there is no significant difference in means for brand ecological image ($p > 0,05$). However, according to the two remaining tests (Control vs. Overpackaging and Non-Overpackaging vs. Overpackaging), the difference in means is statistically significant ($p < 0,05$ and $p < 0,01$, respectively) and it is possible to state that overpackaged products have the lowest brand ecological image.

This way, even though the test between the control and non-overpackaging proved not to be significant, it is still possible to state that non-overpackaged products have, indeed, a higher brand ecological image than overpackaged products, thus **verifying hypothesis 4**.

4.3.6 *Hypothesis 5: Brand ecological image mediates the relationship between overpackaging and consumers' purchase intention*

Regarding brand ecological image's mediating effect in the relationship between overpackaging and purchase intention, the same PROCESS model was used, being the output presented in Appendix 13. Just like in the previous hypothesis, the multicategorical independent variable was coded in the same way into X_1 and X_2. In addition, even though data must be parametric so that linear regression tests can be executed, this mediation model was still used since SPSS does not perform linear regressions in non-parametric data.

Overall, this model is significant ($p < 0,001$) with an R^2 of 24,47%. Starting with path a, the presented stimuli seem to have a statistically significant positive impact on ecological brand image ($b_1 = 0,3418$; $p_1 < 0,01$ and $b_2 = 0,2721$; $p_2 < 0,05$), meaning that both the control group and non-overpackaging have a higher brand ecological image than overpackaging.

Regarding path b, this model shows that brand ecological image has, in fact, a strong, positive and significant impact on purchase intention ($b = 0,5569$; $p < 0,001$). However, the independent variable still has a direct effect ($b_1 = 0,6066$; $p_1 < 0,001$ and $b_2 = 0,3148$; $p_2 < 0,05$) on purchase intention (path c'), suggesting a partial mediation as X is still explaining Y.

Finally, to prove that there is a mediating effect, it is essential to observe the total effect, which is statistically significant ($b_1 = 0,7969$; $p_1 < 0,001$ and $b_2 = 0,4663$; $p_2 < 0,01$), and compare it to the direct one. This difference shows that there is, in fact, a partial mediation (95% CI_1 = [0,0573, 0,3287]; 95% CI_2 = [0,0247, 0,2853]). Therefore, **hypothesis 5 is validated**.

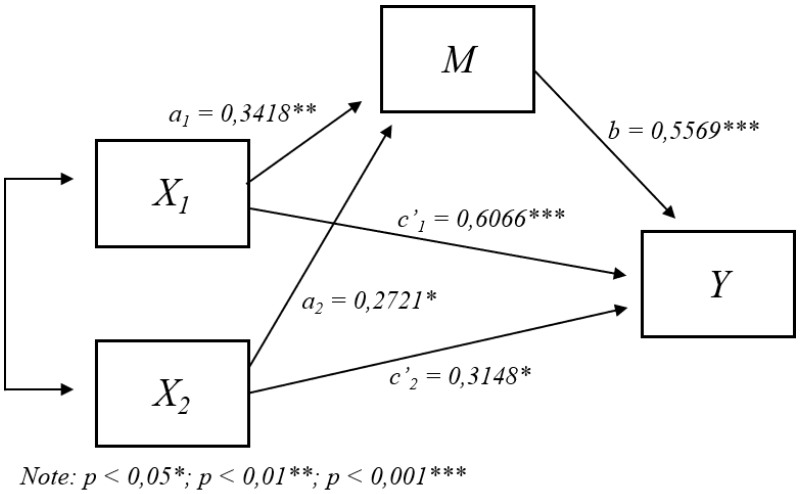

Figure 4: Statistical Model with Coefficients (H_5)

4.3.7 *Analysis including the failed manipulation checks*

Given that a considerate number of answers was deleted due to their failure in complying with the manipulation check (80 out of 521, yielding approximately 15% of the total sample), an analysis including this data must be made in order to verify whether this removal corrupted the results. This way, after performing all the statistical tests one more time, it was possible to observe that the results remained unaltered for each hypothesis, thus proving that the elimination of the failed manipulation checks did not tamper with this study's results.

4.3.8 *Results' Overview*

Hypothesis	Description	Result
H_1	Non-overpackaged products have a higher purchase intention than overpackaged products.	Validated
H_2	Non-overpackaged products have a higher brand image than overpackaged products.	Rejected
H_3	Brand image mediates the relationship between overpackaging and consumers' purchase intention.	Rejected
H_4	Non-overpackaged products have a higher brand ecological image than overpackaged products.	Validated
H_5	Brand ecological image mediates the relationship between overpackaging and consumers' purchase intention.	Validated

Table 6: Results from the Hypotheses' Testing

4.4 Further Results

4.4.1 *Sequential Mediation*

As previously tested in hypothesis 4, brand image does not mediate the relationship between overpackaging and purchase intention. However, the fact this variable is positively correlated to purchase intention and that brand ecological image does mediate the relationship between the dependent and independent variables may enable a sequential mediation model. This way, PROCESS' model 6 was performed and its output can be found in Appendix 14. Just like in the previous hypotheses, the multicategorical independent variable was coded in the same way into X_1 and X_2. In addition, even though data must be parametric so that linear regression tests can be executed, this sequential mediation model will still be used since the SPSS program does not perform linear regressions in non-parametric data.

Overall, this model is significant ($p < 0,001$) with an R^2 of 29,85%. PROCESS' model 6 has two different paths a, one to the first mediator (brand ecological image - M_1) and the other to the second mediator (brand image - M_2). Just like it was assessed in hypotheses 4 and 5, while the independent variables positively affect brand ecological image, it does not affect brand image, which is possible to observe in Figure 3.

Regarding paths b, which are two for the same reason as in paths a, both brand ecological image and brand image have a positive impact on purchase intention ($b_1 = 0,4739$; $p_1 < 0,001$ and $b_2=0,2709$; $p_2 < 0,001$). This result was also already expected from the previously mentioned hypotheses.

Furthermore, path d represents the impact that brand ecological image has on brand image and is positive and statistically significant ($b = 0,3060$; $p < 0,001$). This means that, when brand ecological image rises, brand image also increases.

When it comes to the direct effect (path c'), it is still significant ($b_1 = 0,5954$; $p_1 < 0,001$ and $b_2=0,3197$; $p_2 < 0,05$), suggesting a partial sequential mediation as X is still explaining Y. Finally, in order to verify whether there is a mediating effect, it is crucial to take the total effect (path c) into consideration, which is statistically significant ($b_1 = 0,7969$; $p_1 < 0,001$ and $b_2=0,4663$; $p_2 < 0,01$), just like in the previous hypotheses. In addition, it is possible to observe that most of the mediation's indirect effect (IE) comes from brand ecological image ($IE_1=0,1620$; $IE_2 = 0,1290$), which would be expected since brand image by itself is not a statistically significant mediator.

Finally, after comparing path c' with path c, it is possible to state that there is, in fact, a **partial sequential mediation** (95% CI_1 = [0,0064, 0,0592]; 95% CI_2 = [0,0033, 0,0510]).

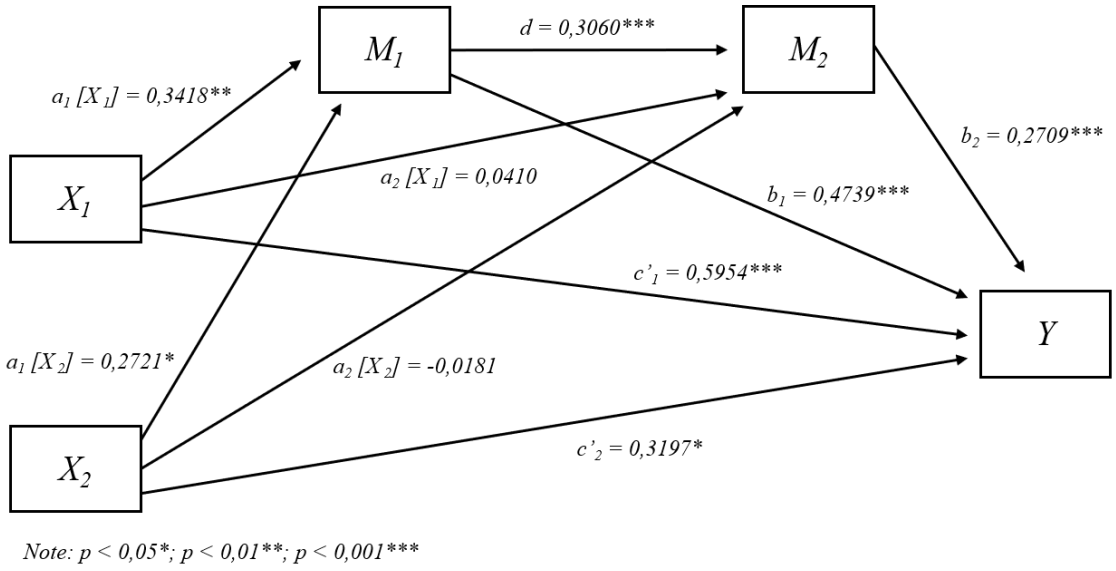

Figure 5: Statistical Model with Coefficients (Sequential Mediation)

4.4.2 *Factor Analysis for Brand Image and Brand Ecological Image*

As previously mentioned, even though brand ecological image can be considered a subcategory of the overall brand image (Ng et al., 2014), this study treated these as separate variables due to the importance that consumers' perceptions of a brand regarding its environmental commitments have in this specific subject. This way, it was easier to assess brand ecological image's individual role in the relationship between overpackaging and purchase intention.

Having this said, in order to prove that brand image and brand ecological are, in fact, correlated but distinct, a factor analysis (Appendix 15) was conducted, gathering the items from both constructs and splitting them into factors. Firstly, in order to verify assumptions and be able to conduct the factor analysis, two tests were performed: the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity. Given that KMO's value is above 0,6 and Bartlett's p-value is below 0,001, it is possible to infer that the assumptions are met. Additionally, after observing the output from the factor analysis, the "Communalities", "Total Variance Explained" and "Rotated Component Matrix" tables suggest that brand image and brand ecological image are, indeed, distinct variables as the items from each construct were allocated to two different factors, one referring to BI and the other to BEI.

CHAPTER 5: CONCLUSIONS AND LIMITATIONS

This following chapter is the final one and will review this study's main findings and draw conclusions based on this analysis, complementing it with previously literature. In addition, this section will also identify managerial and academic implications, followed by limitations and recommendations for further research.

As it was previously mentioned, this dissertation had two main objectives. Firstly, it aimed to assess whether non-overpackaging is preferred over overpackaging in two highly consumed yogurt brands, which would translate into a higher purchase intention for the non-overpackaged product. Additionally, it also intended to verify the mediating role of brand image and brand ecological image in this relationship, as well as their impact on purchase intention.

5.1 Main Findings & Conclusions

In order to gather quantitative data, analyze it and draw conclusions about the study's underlying research questions, an online questionnaire was conducted. As previously mentioned in chapter 3, participants were exposed to one of six scenarios in which their attitudes towards overpackaging and non-overpackaging were assessed. In this sub-chapter, the main findings and conclusions for each research question will be presented.

RQ1: Does the elimination of overpackaging impact consumers' purchase intention?

Overall, consumers' purchase intention is considerably higher for non-overpackaged yogurts than for overpackaged ones, which can be justified by society's increasing concern for sustainability (Kautish et al., 2019), leading consumers to look for environmentally friendly options. Even though these results are not in line with previous studies on overpackaging (Monnot et al., 2019) stating that non-overpackaged products have a mainly negative effect on its purchase intention, they are still supported by Elgaaïed-Gambier (2016), whose study suggests that younger consumers would be more willing to give up their own convenience to preserve the environment and that consumers are more likely to privilege non-overpackaged products when they are dealing with premium brands, which can both be confirmed through this research question since 77,5% of the population was under 35 years old and Danone and Mimosa can be considered premium brands in Portugal.

RQ2: Do brand image and brand ecological image have a mediating role in the relationship between the elimination of overpackaging and consumers' purchase intention?

Before assessing whether these variables have a mediating role in this model, it is important to understand their relationship with the absence or presence of overpackaging. On the one hand, the comparison of brand image means proved not to be significant among the difference stimuli, meaning that consumers' attitudes towards the brand are not affected by the presence or absence of overpackaging. This result was not expected and may have happened due to the use of manipulated and false images of the product or to an unfortunate choice of this variable's construct, which could have been clearer and more applicable to this context. On the other hand, the difference in means for brand ecological image was partially significant: even though the test between the control and non-overpackaging means was not significant, it was still possible to assess that non-overpackaged products have a higher brand ecological image than overpackaged products, confirming Chen et al.'s (2017) findings.

Regarding brand image and its mediating effect, as it would be expected from the non-significance of the difference in means for each scenario (path a), PROCESS' model 4 also yielded an insignificant p-value, meaning that brand image is not a mediator in this model. However, this test showed that brand image is positively correlated to purchase intention, which is in line with Spears and Singh (2004).

When it comes to brand ecological image, after performing the mediation analysis, the obtained results were statistically significant, meaning that this variable is a mediator in this model. In other words, the absence of overpackaging increases brand ecological image, therefore positively impacting purchase intention.

After analyzing these two mediation models, it was noted that, even though brand image was found not to be a significant mediator, this variable was positively correlated to purchase intention. Adding this to the fact that brand ecological image is a mediator in the relationship between X and Y, a sequential mediation model was performed using PROCESS' model 6. Despite the information that had already been given by previous hypotheses, this test showed that there is a positive correlation between brand ecological image (M_1) and brand image (M_2), meaning that, when there is a variation in M_1, M_2 will change in the same direction.

Additionally, as it would be expected since hypothesis 4 was rejected, the results suggest that this mediation's indirect effect comes mostly from brand ecological image.

Finally, the sequential mediation was proved to be statistically significant since none of the 95% confidence intervals included zero, which is interesting given that, when adding brand image to brand ecological image's mediation model, the former becomes a significant mediator due to its considerable correlation with the latter. In other words, the absence of overpackaging positively impacts brand ecological image, which in turn enhances brand image, thus increasing purchase intention.

5.2 Managerial/Academic Implications

This dissertation has proven to be relevant for both managerial and academic applications as it studies an issue that is quite pertinent nowadays and impacts not only companies and its customers but also the academic world by contributing to a subject that still has a lot to be analyzed and discovered.

Regarding the managerial implications, marketers of products from yogurt categories could take this study's results and conclusions into consideration while making decisions as the elimination of overpackaging would benefit not only the environment but also the company and its customers. As this study suggests, this measure would increase consumers' purchase intention, which translates into buying behavior, as well as enhance the company's brand image through the increase in brand ecological image while reducing costs in packaging materials. Additionally, as consumers' demand for sustainable products is increasing and most companies are currently making an effort to reduce their ecological footprint, it would be wise to keep up with this trend and adapt certain strategies to the existing ecologically aware world.

When it comes to the academic implications, even though many researches have already been conducted on sustainability and the importance of packaging, there is still little information on the concept of overpackaging and its advantages and disadvantages. Hence, this study's results contribute to a better understanding of consumers' perceptions about this subject, as well as the relevance that brand image and brand ecological image have in their buying behavior. Moreover, even though it would be expected that a brand's ecological image would increase with a sustainable product, it is still interesting to observe the impact that this variable has on the actual brand image and, consequently, on consumers' purchase intention.

5.3 Limitations and Further Research

Despite the fact that this study has provided interesting insights concerning the intention to buy non-overpackaged consumer packaged goods, there are still several limitations and recommendations for further research that must be addressed.

First and foremost, even though there was a sufficient number of valid responses in the data collection process, the existence of randomized scenarios has made the sample quite small for each of them. Moreover, the gathered data is not considered to be representative of the target population when it comes to sample demographics, which may have occurred due to the used distribution means for the online survey. For further research, it would be wise to reconduct the study with a larger and more representative sample so that more reliable results can be derived.

Secondly, as previously mentioned, there are certain limitations involving the administration of online questionnaires: while convenient to analyze, low in costs and high in speed and amount of responses, this research approach holds little control over the respondents and their environment and provides no opportunity to clarify questions (Malhotra & Birks, 2007), which may have led to inconclusive responses. Additionally, there were some issues with the formulation of certain questions in the survey design, specifically in the manipulation check, which caused the removal of several responses, and in brand image's construct, which may not have been the most adequate one for this study's context. This way, for further research, it is suggested that the used methodology includes a more realistic approach with higher control over the respondents, such as an experiment.

The third limitation is related to the fact that this study only focused on one product category, limiting its application area since the conclusions that were drawn cannot be generalized to all types of products. Hence, further research should be conducted in more than one category in order to increase its applicability and relevance.

Furthermore, even though several articles and researches have applied purchase intention as a key indicator of actual purchase behaviors (Chang & Wildt, 1994; Kalwani & Silk, 1982), this may have influenced the obtained results since purchase intention is merely a proxy and there is still a gap between these two.

Lastly, the abnormality of the data's distribution affected the analysis' power as non-parametric tests have less statistical power than parametric tests, which happens due to the fact that these are the most likely to reject an hypothesis when it is false (Siegel, 1957).

As an additional recommendation for further research, it would be interesting to include other relevant variables. While prices, for instance, were not included in this study, the price effect could be explored: these could be similar for overpackaged and non-overpackaged products or could even be lower for non-overpackaged products as there is a reduction in packaging materials and, consequently, in costs. By manipulating the price of non-overpackaged products, relevant insights may arise. In addition, the communication of a sustainable format in the non-overpackaged products' packaging could also have an impact on consumers' perceptions and buying behaviors as they are more aware of the products' sustainability. Finally, consumers' environmental consciousness could also be better explored in further research since this study did not draw any significant conclusions from this variable.

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APPENDICES

Appendix 1: Online Survey's Script

Introduction

Thank you in advance for your attention and participation in this study.

My name is Teresa Alves and this survey aims to gather information for my thesis, the final step to complete the Master's in Management with Specialization in Strategic Marketing.

This questionnaire will take approximately **4 minutes** to complete. Please answer as honestly as possible and keep in mind that there are **no right or wrong answers**. All the responses will remain **anonymous** and the collected information will be solely used for academic purposes.

If you have any questions, don't hesitate to contact me: 152119213@alunos.lisboa.ucp.pt.

Once again, thank you for your help!

Block 1: Control Question

Q1: On average, how frequently have you consumed yogurts in the past 12 months?

- Daily
- Weekly
- Monthly
- Quarterly
- Every six months
- Annually
- Never

Block 2: Environmental Consciousness

Q2: Please indicate your level of agreement with the following statements. [*(1) Strongly Disagree - (7) Strongly Agree*]

- I choose the environmentally friendly alternative if one of a similar price is available.
- I choose the environmentally friendly alternative regardless of the price.
- I try to discover the environmental effects of products prior to their purchase.

Block 3: Stimuli (*each respondent is presented with one of 6 possible scenarios and answers the following questions*)

Q3: Imagine that, the next time you go to the supermarket, you see this product. Please take a moment to observe it and answer the following questions.

NON-OVERPACKAGING	CONTROL	OVERPACKAGING
		
		

Q4: Do you consider that the presented product is...

- using an excessive amount of packaging materials? Yes/No
- using a normal amount of packaging materials? Yes/No
- using less packaging materials than usual? Yes/No

Q5: Please indicate your level of agreement with the following statements. [*(1) Strongly Disagree - (7) Strongly Agree*]

- I believe that most people would like to buy this product.
- I would be glad to try this product.
- I would recommend this product to my friends.
- I would purchase this product.

Q6: Define **Danone**/**Mimosa** according to the following characteristics:

	1	2	3	4	5	6	7	
Unfriendly	○	○	○	○	○	○	○	Friendly
Outdated	○	○	○	○	○	○	○	Modern
Not useful	○	○	○	○	○	○	○	Useful
Unpopular	○	○	○	○	○	○	○	Popular
Harsh	○	○	○	○	○	○	○	Gentle
Artificial	○	○	○	○	○	○	○	Natural

Q7: Still thinking about **Danone**/**Mimosa**, please indicate your level of agreement with the following statements. [*(1) Strongly Disagree - (7) Strongly Agree*]

- The brand is concerned about the environment.
- I have the impression that the brand tries to respect the environment.
- The brand's products are environmentally friendly.

Block 4: Demographics

Q8: What is your gender?

- Male
- Female

Q9: What is your country of origin?

▼ Portugal (1358) ... Zimbabwe (1357)

Q10: What is your age group?

- Under 18 years old
- 18 - 24 years old
- 25 - 34 years old
- 35 - 44 years old
- 45 - 54 years old
- 55 - 64 years old
- 65 - 74 years old
- 75 - 84 years old
- Over 85 years old

Q11: What is the highest education level you have completed?

- Less than a High School diploma
- High School diploma
- Bachelor's degree
- Master's degree
- PhD degree

Q12: What is your current occupation?

- Student
- Student-Worker
- Employed
- Unemployed
- Retired

Q13: What is your **household's** approximate yearly net income?

- Less than €10,000
- €10,000 - €39,999
- €40,000 - €69,999
- €70,000 - €99,999
- €100,000 - €149,999
- More than €150,000

Appendix 2: Cronbach's Alphas

Construct	Number of Items	Cronbach's α
Environmental Consciousness	3	0,693
Stimulus 1: Danone, Control		
Purchase Intention	4	0,788
Brand Image	6	0,747
Brand Ecological Image	3	0,831
Stimulus 2: Danone, Non-Overpackaging		
Purchase Intention	4	0,913
Brand Image	6	0,874
Brand Ecological Image	3	0,901
Stimulus 3: Danone, Overpackaging		
Purchase Intention	4	0,850
Brand Image	6	0,825
Brand Ecological Image	3	0,884
Stimulus 4: Mimosa, Control		
Purchase Intention	4	0,873
Brand Image	6	0,933
Brand Ecological Image	3	0,907
Stimulus 5: Mimosa, Non-Overpackaging		
Purchase Intention	4	0,827
Brand Image	6	0,848
Brand Ecological Image	3	0,899
Stimulus 6: Mimosa, Overpackaging		
Purchase Intention	4	0,826
Brand Image	6	0,868
Brand Ecological Image	3	0,801

Appendix 3: Normality Tests

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Purchase Intention	,084	383	,000	,969	383	,000
Brand Image	,146	383	,000	,922	383	,000
Green Brand Image	,215	383	,000	,930	383	,000

a. Lilliefors Significance Correction

Appendix 4: Descriptive Statistics within each Stimulus Group

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	116	1,00	7,00	4,7198	1,19426
Brand Image	116	1,00	7,00	5,1911	1,21470
Brand Ecological Image	116	1,00	6,00	4,1695	,91630
Environmental Consciouness	116	1,00	6,67	4,0690	1,22496
Valid N (listwise)	116				

a. Stimulus Group 2 = Control

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	124	1,75	7,00	5,0504	1,24572
Brand Image	124	1,00	7,00	5,2715	1,15948
Brand Ecological Image	124	1,00	7,00	4,2392	1,04164
Environmental Consciouness	124	1,00	7,00	3,8978	1,38071
Valid N (listwise)	124				

a. Stimulus Group 2 = Non-OP

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	143	1,00	6,50	4,2535	1,27302
Brand Image	143	1,50	7,00	5,1259	1,05654
Brand Ecological Image	143	1,00	6,00	3,8974	,94631
Environmental Consciouness	143	1,00	7,00	4,1981	1,30860
Valid N (listwise)	143				

a. Stimulus Group 2 = OP

Appendix 5: Descriptive Statistics within each Brand's Stimulus

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	53	2,75	6,75	4,9575	1,04552
Brand Image	53	2,33	7,00	5,2579	,85832
Brand Ecological Image	53	2,00	6,00	4,1824	,78055
Valid N (listwise)	53				

a. Stimulus Group = Danone Control

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	66	1,75	7,00	5,2803	1,18445
Brand Image	66	1,00	7,00	5,2955	1,18855
Brand Ecological Image	66	1,67	7,00	4,3030	1,06012
Valid N (listwise)	66				

a. Stimulus Group = Danone Non-OP

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	76	1,00	6,50	4,5362	1,20741
Brand Image	76	2,00	7,00	5,2237	1,01491
Brand Ecological Image	76	2,00	6,00	4,0746	,93903
Valid N (listwise)	76				

a. Stimulus Group = Danone OP

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	63	1,00	7,00	4,5198	1,28052
Brand Image	63	1,00	7,00	5,1349	1,45323
Brand Ecological Image	63	1,00	6,00	4,1587	1,02278
Valid N (listwise)	63				

a. Stimulus Group = Mimosa Control

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	58	1,75	7,00	4,7888	1,27200
Brand Image	58	1,00	7,00	5,2443	1,13521
Brand Ecological Image	58	1,00	7,00	4,1667	1,02455
Valid N (listwise)	58				

a. Stimulus Group = Mimosa Non-OP

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation
Purchase Intention	67	1,75	6,25	3,9328	1,27815
Brand Image	67	1,50	7,00	5,0149	1,09895
Brand Ecological Image	67	1,00	6,00	3,6965	,92064
Valid N (listwise)	67				

a. Stimulus Group = Mimosa OP

Appendix 6: Descriptive Statistics - Mann-Whitney U Tests (Danone vs. Mimosa)

Ranks

	Stimulus Group	N	Mean Rank	Sum of Ranks
Purchase Intention	Danone Control	53	65,21	3456,00
	Mimosa Control	63	52,86	3330,00
	Total	116		
Brand Image	Danone Control	53	56,01	2968,50
	Mimosa Control	63	60,60	3817,50
	Total	116		
Brand Ecological Image	Danone Control	53	58,01	3074,50
	Mimosa Control	63	58,91	3711,50
	Total	116		

Test Statistics[a]

	Purchase Intention	Brand Image	Brand Ecological Image
Mann-Whitney U	1314,000	1537,500	1643,500
Wilcoxon W	3330,000	2968,500	3074,500
Z	-1,977	-,733	-,150
Asymp. Sig. (2-tailed)	,048	,463	,880

a. Grouping Variable: Stimulus Group

Ranks

	Stimulus Group	N	Mean Rank	Sum of Ranks
Purchase Intention	Danone Non-OP	66	69,45	4583,50
	Mimosa Non-OP	58	54,59	3166,50
	Total	124		
Brand Image	Danone Non-OP	66	62,79	4144,00
	Mimosa Non-OP	58	62,17	3606,00
	Total	124		
Brand Ecological Image	Danone Non-OP	66	63,11	4165,00
	Mimosa Non-OP	58	61,81	3585,00
	Total	124		

Test Statistics[a]

	Purchase Intention	Brand Image	Brand Ecological Image
Mann-Whitney U	1455,500	1895,000	1874,000
Wilcoxon W	3166,500	3606,000	3585,000
Z	-2,308	-,095	-,204
Asymp. Sig. (2-tailed)	,021	,924	,838

a. Grouping Variable: Stimulus Group

Ranks

	Stimulus Group	N	Mean Rank	Sum of Ranks
Purchase Intention	Danone OP	76	81,36	6183,00
	Mimosa OP	67	61,39	4113,00
	Total	143		
Brand Image	Danone OP	76	75,30	5722,50
	Mimosa OP	67	68,26	4573,50
	Total	143		
Brand Ecological Image	Danone OP	76	78,74	5984,00
	Mimosa OP	67	64,36	4312,00
	Total	143		

Test Statistics[a]

	Purchase Intention	Brand Image	Brand Ecological Image
Mann-Whitney U	1835,000	2295,500	2034,000
Wilcoxon W	4113,000	4573,500	4312,000
Z	-2,884	-1,015	-2,151
Asymp. Sig. (2-tailed)	,004	,310	,032

a. Grouping Variable: Stimulus Group

Appendix 7: Hypothesis 1 - Kruskal-Wallis H Test

Ranks

	Stimulus Group 2	N	Mean Rank
Purchase Intention	Control	116	195,91
	Non-OP	124	226,68
	OP	143	158,76
	Total	383	

Test Statistics[a,b]

	Purchase Intention
Kruskal-Wallis H	25,358
df	2
Asymp. Sig.	,000

a. Kruskal Wallis Test

b. Grouping Variable: Stimulus Group 2

Appendix 8: Hypothesis 1 - Mann-Whitney U Tests

Ranks

	Stimulus Group 2	N	Mean Rank	Sum of Ranks
Purchase Intention	Control	116	110,08	12769,00
	Non-OP	124	130,25	16151,00
	Total	240		

Test Statistics[a]

	Purchase Intention
Mann-Whitney U	5983,000
Wilcoxon W	12769,000
Z	-2,258
Asymp. Sig. (2-tailed)	,024

a. Grouping Variable: Stimulus Group 2

Ranks

	Stimulus Group 2	N	Mean Rank	Sum of Ranks
Purchase Intention	Control	116	144,33	16742,50
	OP	143	118,37	16927,50
	Total	259		

Test Statistics[a]

	Purchase Intention
Mann-Whitney U	6631,500
Wilcoxon W	16927,500
Z	-2,780
Asymp. Sig. (2-tailed)	,005

a. Grouping Variable: Stimulus Group 2

Ranks

	Stimulus Group 2	N	Mean Rank	Sum of Ranks
Purchase Intention	Non-OP	124	158,93	19707,00
	OP	143	112,38	16071,00
	Total	267		

Test Statistics[a]

	Purchase Intention
Mann-Whitney U	5775,000
Wilcoxon W	16071,000
Z	-4,927
Asymp. Sig. (2-tailed)	,000

a. Grouping Variable: Stimulus Group 2

Appendix 9: Hypothesis 2 - Kruskal-Wallis H Test

Ranks

	Stimulus Group 2	N	Mean Rank
Brand Image	Control	116	199,00
	Non-OP	124	201,25
	OP	143	178,30
	Total	383	

Test Statistics[a,b]

	Brand Image
Kruskal-Wallis H	3,533
df	2
Asymp. Sig.	,171

a. Kruskal Wallis Test

b. Grouping Variable: Stimulus Group 2

Appendix 10: Hypothesis 3 - PROCESS Mediation Test for Brand Image

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5 ***************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : PI
    X  : SG2Rec
    M  : BI

Sample
Size:  383
```

```
Coding of categorical X variable for analysis:
 SG2Rec     X1     X2
  1,000   ,000   ,000
  2,000  1,000   ,000
  3,000   ,000  1,000

************************************************************************
OUTCOME VARIABLE:
 BI

Model Summary
        R     R-sq      MSE        F      df1       df2        p
    ,0534    ,0028   1,2988    ,5424   2,0000  380,0000    ,5818

Model
            coeff       se         t        p     LLCI     ULCI
constant   5,1259    ,0953   53,7850    ,0000   4,9385   5,3133
X1          ,1456    ,1398    1,0414    ,2984   -,1293    ,4206
X2          ,0652    ,1424     ,4580    ,6472   -,2148    ,3452

************************************************************************
OUTCOME VARIABLE:
 PI

Model Summary
        R     R-sq      MSE         F      df1       df2        p
    ,4236    ,1794   1,3596   27,6242   3,0000  379,0000    ,0000

Model
            coeff       se        t        p     LLCI     ULCI
constant   2,3266    ,2862   8,1306    ,0000   1,7640   2,8892
X1          ,7422    ,1433   5,1797    ,0000    ,4604   1,0239
X2          ,4418    ,1457   3,0316    ,0026    ,1553    ,7284
BI          ,3759    ,0525   7,1624    ,0000    ,2727    ,4791

*********************** TOTAL EFFECT MODEL ***************************
OUTCOME VARIABLE:
 PI

Model Summary
        R     R-sq      MSE         F      df1       df2        p
    ,2615    ,0684   1,5395   13,9409   2,0000  380,0000    ,0000

Model
            coeff       se         t        p     LLCI     ULCI
constant   4,2535    ,1038   40,9942    ,0000   4,0495   4,4575
X1          ,7969    ,1523    5,2341    ,0000    ,4975   1,0963
X2          ,4663    ,1550    3,0078    ,0028    ,1615    ,7712

*********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y ************

Relative total effects of X on Y:
     Effect       se        t        p     LLCI     ULCI     c_ps
X1    ,7969    ,1523   5,2341    ,0000    ,4975   1,0963    ,6216
X2    ,4663    ,1550   3,0078    ,0028    ,1615    ,7712    ,3637

Omnibus test of total effect of X on Y:
    R2-chng          F        df1        df2          p
      ,0684    13,9409     2,0000   380,0000      ,0000
----------
```

```
Relative direct effects of X on Y
     Effect        se         t         p      LLCI      ULCI     c'_ps
X1    ,7422     ,1433    5,1797     ,0000     ,4604    1,0239     ,5789
X2    ,4418     ,1457    3,0316     ,0026     ,1553     ,7284     ,3446

Omnibus test of direct effect of X on Y:
    R2-chng           F         df1         df2           p
      ,0593    13,6955     2,0000   379,0000      ,0000
----------
Relative indirect effects of X on Y

 SG2Rec       ->     BI           ->     PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,0547      ,0539     -,0414      ,1692
X2      ,0245      ,0564     -,0831      ,1393

Partially standardized relative indirect effect(s) of X on Y:

 SG2Rec       ->     BI           ->     PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,0427      ,0418     -,0327      ,1297
X2      ,0191      ,0439     -,0647      ,1075

********************* ANALYSIS NOTES AND ERRORS **********************

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Appendix 11: Hypothesis 4 - Kruskal-Wallis H Test

Ranks

	Stimulus Group 2	N	Mean Rank
Brand Ecological Image	Control	116	201,59
	Non-OP	124	210,40
	OP	143	168,27
	Total	383	

Test Statistics[a,b]

	Brand Ecological Image
Kruskal-Wallis H	11,576
df	2
Asymp. Sig.	,003

a. Kruskal Wallis Test

b. Grouping Variable: Stimulus Group 2

Appendix 12: Hypothesis 4 - Mann-Whitney U Tests

Ranks

	Stimulus Group 2	N	Mean Rank	Sum of Ranks
Brand Ecological Image	Control	116	117,29	13605,50
	Non-OP	124	123,50	15314,50
	Total	240		

Test Statistics[a]

	Brand Ecological Image
Mann-Whitney U	6819,500
Wilcoxon W	13605,500
Z	-,713
Asymp. Sig. (2-tailed)	,476

a. Grouping Variable: Stimulus Group 2

Ranks

	Stimulus Group 2	N	Mean Rank	Sum of Ranks
Brand Ecological Image	Control	116	142,80	16565,00
	OP	143	119,62	17105,00
	Total	259		

Test Statistics[a]

	Brand Ecological Image
Mann-Whitney U	6809,000
Wilcoxon W	17105,000
Z	-2,578
Asymp. Sig. (2-tailed)	,010

a. Grouping Variable: Stimulus Group 2

Ranks

	Stimulus Group 2	N	Mean Rank	Sum of Ranks
Brand Ecological Image	Non-OP	124	149,39	18524,50
	OP	143	120,65	17253,50
	Total	267		

Test Statistics[a]

	Brand Ecological Image
Mann-Whitney U	6957,500
Wilcoxon W	17253,500
Z	-3,117
Asymp. Sig. (2-tailed)	,002

a. Grouping Variable: Stimulus Group 2

Appendix 13: Hypothesis 5 - PROCESS Mediation Test for Brand Ecological Image

```
Run MATRIX procedure:

*************** PROCESS Procedure for SPSS Version 3.5 ***************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 4
    Y  : PI
    X  : SG2Rec
    M  : EBI

Sample
Size:  383

Coding of categorical X variable for analysis:
 SG2Rec     X1     X2
  1,000   ,000   ,000
  2,000  1,000   ,000
  3,000   ,000  1,000

**************************************************************************
OUTCOME VARIABLE:
 EBI

Model Summary
        R     R-sq      MSE         F      df1       df2         p
    ,1551    ,0240    ,9399    4,6803   2,0000  380,0000    ,0098

Model
            coeff       se         t         p      LLCI      ULCI
constant   3,8974    ,0811   48,0727    ,0000    3,7380    4,0568
X1          ,3418    ,1190    2,8732    ,0043    ,1079     ,5757
X2          ,2721    ,1211    2,2461    ,0253    ,0339     ,5103
```

```
**************************************************************************
OUTCOME VARIABLE:
 PI

Model Summary
        R     R-sq      MSE         F      df1        df2        p
    ,4947    ,2447   1,2513   40,9392   3,0000   379,0000    ,0000

Model
            coeff       se        t        p     LLCI     ULCI
constant   2,0831    ,2489   8,3683    ,0000   1,5937   2,5726
X1          ,6066    ,1387   4,3717    ,0000    ,3337    ,8794
X2          ,3148    ,1407   2,2374    ,0258    ,0381    ,5915
EBI         ,5569    ,0592   9,4082    ,0000    ,4405    ,6732

************************ TOTAL EFFECT MODEL ************************
OUTCOME VARIABLE:
 PI

Model Summary
        R     R-sq      MSE         F      df1        df2        p
    ,2615    ,0684   1,5395   13,9409   2,0000   380,0000    ,0000

Model
            coeff       se         t        p     LLCI     ULCI
constant   4,2535    ,1038   40,9942    ,0000   4,0495   4,4575
X1          ,7969    ,1523    5,2341    ,0000    ,4975   1,0963
X2          ,4663    ,1550    3,0078    ,0028    ,1615    ,7712

*********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y ************

Relative total effects of X on Y:
     Effect       se        t        p     LLCI     ULCI     c_ps
X1    ,7969    ,1523   5,2341    ,0000    ,4975   1,0963    ,6216
X2    ,4663    ,1550   3,0078    ,0028    ,1615    ,7712    ,3637

Omnibus test of total effect of X on Y:
    R2-chng          F        df1        df2        p
      ,0684    13,9409     2,0000   380,0000    ,0000
----------
Relative direct effects of X on Y
     Effect       se        t        p     LLCI     ULCI    c'_ps
X1    ,6066    ,1387   4,3717    ,0000    ,3337    ,8794    ,4731
X2    ,3148    ,1407   2,2374    ,0258    ,0381    ,5915    ,2455

Omnibus test of direct effect of X on Y:
    R2-chng          F        df1        df2          p
      ,0382     9,5825     2,0000   379,0000      ,0001
----------
Relative indirect effects of X on Y

 SG2Rec      ->    EBI         ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,1903      ,0693      ,0573      ,3287
X2      ,1515      ,0664      ,0247      ,2853
```

```
Partially standardized relative indirect effect(s) of X on Y:

 SG2Rec      ->    EBI         ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,1485      ,0531      ,0454      ,2522
X2      ,1182      ,0515      ,0189      ,2215

********************* ANALYSIS NOTES AND ERRORS **********************

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Appendix 14: Further Results - PROCESS Sequential Mediation Test

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.5 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**************************************************************************
Model  : 6
    Y  : PI
    X  : SG2Rec
   M1  : EBI
   M2  : BI

Sample
Size:  383

Coding of categorical X variable for analysis:
 SG2Rec     X1     X2
  1,000   ,000   ,000
  2,000  1,000   ,000
  3,000   ,000  1,000

**************************************************************************
OUTCOME VARIABLE:
 EBI

Model Summary
        R       R-sq        MSE          F        df1        df2          p
    ,1551      ,0240      ,9399     4,6803     2,0000   380,0000      ,0098

Model
              coeff         se          t          p       LLCI       ULCI
constant     3,8974      ,0811    48,0727      ,0000     3,7380     4,0568
X1            ,3418      ,1190     2,8732      ,0043      ,1079      ,5757
X2            ,2721      ,1211     2,2461      ,0253      ,0339      ,5103

**************************************************************************
```

```
OUTCOME VARIABLE:
 BI

Model Summary
        R       R-sq        MSE          F        df1        df2          p
    ,2654      ,0704     1,2140     9,5726     3,0000   379,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     3,9331      ,2452    16,0410      ,0000     3,4510     4,4152
X1            ,0410      ,1367      ,3002      ,7642     -,2277      ,3097
X2           -,0181      ,1386     -,1303      ,8964     -,2906      ,2544
EBI           ,3060      ,0583     5,2495      ,0000      ,1914      ,4207

**************************************************************************
OUTCOME VARIABLE:
 PI

Model Summary
        R       R-sq        MSE          F        df1        df2          p
    ,5464      ,2985     1,1653    40,2181     4,0000   378,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     1,0175      ,3113     3,2689      ,0012      ,4055     1,6295
X1            ,5954      ,1339     4,4466      ,0000      ,3321      ,8587
X2            ,3197      ,1358     2,3545      ,0191      ,0527      ,5867
EBI           ,4739      ,0592     8,0115      ,0000      ,3576      ,5903
BI            ,2709      ,0503     5,3839      ,0000      ,1720      ,3699

************************* TOTAL EFFECT MODEL ****************************
OUTCOME VARIABLE:
 PI

Model Summary
        R       R-sq        MSE          F        df1        df2          p
    ,2615      ,0684     1,5395    13,9409     2,0000   380,0000      ,0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     4,2535      ,1038    40,9942      ,0000     4,0495     4,4575
X1            ,7969      ,1523     5,2341      ,0000      ,4975     1,0963
X2            ,4663      ,1550     3,0078      ,0028      ,1615      ,7712

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Relative total effects of X on Y:
     Effect         se          t          p       LLCI       ULCI       c_ps
X1    ,7969      ,1523     5,2341      ,0000      ,4975     1,0963      ,6216
X2    ,4663      ,1550     3,0078      ,0028      ,1615      ,7712      ,3637

Omnibus test of total effect of X on Y:
    R2-chng          F        df1        df2          p
      ,0684    13,9409     2,0000   380,0000      ,0000
----------

Relative direct effects of X on Y
     Effect         se          t          p       LLCI       ULCI      c'_ps
X1    ,5954      ,1339     4,4466      ,0000      ,3321      ,8587      ,4644
X2    ,3197      ,1358     2,3545      ,0191      ,0527      ,5867      ,2494
```

```
Omnibus test of direct effect of X on Y:
    R2-chng          F        df1        df2          p
      ,0369     9,9392     2,0000   378,0000      ,0001
----------

Relative indirect effects of X on Y

 SG2Rec      ->    EBI         ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,1620      ,0612      ,0429      ,2870
X2      ,1290      ,0560      ,0232      ,2410

 SG2Rec      ->    BI          ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,0111      ,0361     -,0568      ,0870
X2     -,0049      ,0389     -,0847      ,0725

 SG2Rec      ->    EBI         ->    BI          ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,0283      ,0133      ,0064      ,0592
X2      ,0226      ,0125      ,0033      ,0510

Partially standardized relative indirect effect(s) of X on Y:

 SG2Rec      ->    EBI         ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,1264      ,0470      ,0342      ,2198
X2      ,1006      ,0434      ,0184      ,1874

 SG2Rec      ->    BI          ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,0087      ,0281     -,0444      ,0673
X2     -,0038      ,0303     -,0664      ,0565

 SG2Rec      ->    EBI         ->    BI          ->    PI

       Effect     BootSE   BootLLCI   BootULCI
X1      ,0221      ,0103      ,0052      ,0458
X2      ,0176      ,0097      ,0025      ,0399

************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```

Appendix 15: Further Results - Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,829
Bartlett's Test of Sphericity	Approx. Chi-Square	1747,305
	df	36
	Sig.	,000

Communalities

	Initial	Extraction
BI: Unfriendly-Friendly	1,000	,688
BI: Outdated-Modern	1,000	,484
BI: Not useful-Useful	1,000	,696
BI: Unpopular-Popular	1,000	,680
BI: Harsh-Gentle	1,000	,641
BI: Artificial-Natural	1,000	,560
BEI: The brand is concerned about the environment.	1,000	,850
BEI: I have the impression that the brand tries to respect the environment.	1,000	,771
BEI: The brand's products are environmentally friendly.	1,000	,794

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component 1	Component 2
BI: Unfriendly-Friendly	,817	,142
BI: Outdated-Modern	,620	,316
BI: Not useful-Useful	,833	,038
BI: Unpopular-Popular	,814	-,129
BI: Harsh-Gentle	,797	,080
BI: Artificial-Natural	,698	,270
BEI: The brand is concerned about the environment.	,028	,921
BEI: I have the impression that the brand tries to respect the environment.	,153	,865
BEI: The brand's products are environmentally friendly.	,126	,882

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,985	44,283	44,283	3,985	44,283	44,283	3,571	39,675	39,675
2	2,178	24,195	68,478	2,178	24,195	68,478	2,592	28,803	68,478
3	,600	6,667	75,145						
4	,556	6,183	81,328						
5	,476	5,294	86,622						
6	,371	4,124	90,746						
7	,357	3,963	94,709						
8	,291	3,235	97,943						
9	,185	2,057	100,000						

Extraction Method: Principal Component Analysis.