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Eco-Conscious Beauty: Sustainable Packaging and Shampoo Refill Systems

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Abstract

This dissertation investigates the impact of sustainable packaging on the hair sector in Portugal, specifically focusing on the adoption of shampoo refill systems among Portuguese female consumers. Stimulated by growing environmental concerns and the rise of e-commerce, the study explores the factors that influence purchasing decisions related to refill systems.

Using qualitative and quantitative methodologies, the research analyses consumers' perceptions of sustainability and ease of use.

The results reveal that although consumer awareness of environmental issues is high, price, promotional discounts and packaging capacity are more decisive factors influencing purchasing decisions. The study also highlights the significant influence of social norms and communication strategies on consumer choices.

The results provide valuable information for cosmetics companies wishing to develop effective strategies to promote sustainable packaging and increase market share in the competitive Portuguese market.

Title: Eco-Conscious Beauty: Sustainable Packaging and Shampoo Refill Systems

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Abstract

Esta dissertação investiga o impacto das embalagens sustentáveis no setor capilar em Portugal, centrando-se especificamente na adoção de sistemas de recarga de champô entre as consumidoras femininas portuguesas. Estimulado pelas crescentes preocupações ambientais e pelo aumento do comércio eletrónico, o estudo explora os factores que influenciam as decisões de compra relacionadas com os sistemas de recarga.

Utilizando metodologias qualitativas e quantitativas, a investigação analisa as perceções dos consumidores sobre a sustentabilidade e a facilidade de utilização.

Os resultados revelam que, embora a sensibilização dos consumidores para as questões ambientais seja elevada, o preço, os descontos promocionais e a capacidade da embalagem são factores mais decisivos que influenciam as decisões de compra. O estudo também destaca a influência significativa das normas sociais e das estratégias de comunicação nas escolhas dos consumidores.

Os resultados fornecem informações valiosas para as empresas de cosméticos que pretendem desenvolver estratégias eficazes para promover embalagens sustentáveis e aumentar a quota de mercado no competitivo mercado português.

Titulo: Beleza eco-consciente: Embalagens sustentáveis e sistemas de recarga de champô

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Palavras-chave: Produtos cosméticos, sistemas de recarga, consumidores do sexo feminino

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1. Introduction

A mounting sense of apprehension surrounding environmental sustainability, coupled with the escalating prevalence of online shopping in the cosmetics sector – a major contributor to plastic waste production – is exerting pressure on consumers, who are increasingly cognizant of health and environmental concerns. This has given rise to a heightened demand for sustainable products and packaging.

This study investigates the adoption of shampoo refill systems by Portuguese female consumers, analysing the barriers to their use and the role of communication in the purchasing decision.

The research focuses on Portuguese consumers who purchase shampoos online, seeking to identify the factors that motivate or inhibit the purchase of products with refill systems. The research questions explore the influence of ease of use and environmental awareness on the purchase decision, as well as the impact of sustainability communication on purchase intention.

This dissertation is organised into seven chapters in which the ‘Introduction’ section provides an overview of the research topic and the scope of the study.

The ‘Market Analysis’ section delves into the cosmetics market, the evolution of the sector and its trends worldwide and in the Portuguese market.

The ‘Literature review’ section presents existing research on sustainable packaging, important definitions to be defined and theories that helped the study to be more complete.

The problem statement section contains the framework and objectives of the study.

The ‘Qualitative Study’ section describes the methodology used in the online interviews and presents the main results of this research.

The ‘Quantitative Study’ section describes the methodology used to analyse the data collected through the online survey and reports the main results of this analysis.

The 'Conclusions' section summarises the main findings of the study and also identifies potential directions for future research on this topic.

2. Market analysis

2.1. History of the sector

The history of the cosmetics sector can be traced back to ancient Egypt, where its initial use was associated with hygienic objectives and health benefits. Over time, the function of cosmetics has evolved, incorporating innovative approaches aimed at improving health and combating the effects of skin ageing (Amberg & Fogarassy, 2019).

In recent decades, there has been a discernible tendency towards the incorporation of natural components in the sector's products. This shift is attributed to a growing awareness of the adverse effects of synthetic materials on human health and the environment. Consequently, the cosmetics market has undergone a process of adaptation, with a corresponding shift towards the promotion of natural solutions that align with a healthy lifestyle. This has involved the linking of cosmetic product use with the promotion of healthier eating practices (Amberg & Fogarassy, 2019).

The role of cosmetics in society has evolved significantly, becoming deeply integrated into daily life. Soap, shampoo and toothpaste are now considered staple items, with purchasing decisions often influenced more by price than by environmental sustainability. Makeup and sunscreen remain essential for appearance and skin health, maintaining their established presence in daily routines (Mark, 2017).

2.2. Defining cosmetics

One of the most significant challenges in the field of cosmetics is the definition of what constitutes a cosmetic product, given the diverse range of products within this sector. In accordance with Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009, a cosmetic product is defined as a mixture that is intended to come into contact with the external surfaces of the human body, including the skin, hair, nails, lips, and external genitalia, as well as the teeth and mucous membranes of the mouth. The principal objective of these products is to cleanse, perfume, modify appearance, protect, maintain in good condition or correct body odours. The evaluation of a product as a cosmetic must be conducted on a case-by-case basis, taking into account its specific characteristics. This encompasses a range of products, including creams, soaps, shampoos, perfumes, make-up and dental care products. It is of the utmost importance that the presentation of these products does not cause confusion with foodstuffs, thereby ensuring the health and safety of consumers.

As indicated by Statista (2024), the cosmetics and personal care market can be classified into five principal business segments: skincare, haircare, makeup, perfumes and hygiene products.

2.3. Evolution of the sector

The evolution of the sector can be observed from the perspective that it is divided into five segments. Graph 1, which can be consulted in Appendix 1, according to Statista (2024), illustrates that skincare has consistently maintained the largest market share over the years, reaching 40% of the global cosmetics market by 2023. This particular market segment has experienced an increase in recent years, reflecting a growing concern among older consumers regarding their health and appearance. The hair care segment represents the second largest category, accounting for 21% of the global market in 2023. The remaining segments have a comparatively smaller share of the global market yet have nevertheless remained in a state of equilibrium.

In contrast with the findings of the McKinsey & Company article (2023), the cosmetics and personal care products market can be divided into four distinct segments: fragrances, make-up, hair care and skin care. This market is notable for its resilience and its capacity to evolve continuously. A review of the graph reveals a consistent growth trajectory for the sector and its four segments. However, it is notable that in 2021, the sector experienced a decline due to the impact of the global pandemic (Graph 2, which can be consulted in Appendix 1). Since then, the market has demonstrated resilience, with projections indicating a 6% annual growth rate until 2027 (McKinsey & Company, 2023).

From a geographical standpoint, it is crucial for the brand to maintain a strong presence in these two markets: Asia-Pacific and North America (McKinsey & Company, 2023).

The market in the Asia-Pacific region is driven by the quality of the products, given the large ageing population in countries such as Japan, China and India, which directly increases the demand for anti-wrinkle, anti-ageing and dark spot products (Spherical Insights, 2023).

In the case of the North American region, the market share in 2023 was 29% (Statista, 2024). The market has observed a surge in demand for premium brands within the sector, driven by an increase in dermatological issues such as rashes and wrinkles in the USA and Mexico (Spherical Insights, 2023).

Nevertheless, both markets will present growth challenges for individual brands due to the prevalence of intense local and international competition. Concurrently, other regions, such as

the Middle East and India, are positioned to assume greater prominence, offering distinct potential for specific categories and price ranges. This will likely prompt many brands to modify their geographical strategies in response to this new global dynamic, necessitating the formulation of bespoke strategies for each location (McKinsey & Company, 2023).

2.4. Leading brands in the world

The global market is dominated by four leading brands, which have distinguished themselves through their commitment to innovation and unwavering quality standards. Graph 3, which can be found in Appendix 2, from Statista (2024), which represents the revenue of the top ten cosmetics manufacturers in the world in 2023, begins with an examination of the market leader, L'Oreal. With a history spanning over 110 years, L'Oreal has positioned itself as a leading provider of luxury beauty products, offering a range of products that are accessible to a diverse customer base. The company's commitment to scientific innovation and quality is evident across all segments of the cosmetics sector. This group includes other brands such as L'Oréal Paris and Garnier, which are renowned for their affordability and innovation, and Lancôme and Kérastase, which offer luxury products. Maybelline New York, which offers innovative make-up products. The Matrix brand, which offers professional hair care. Finally, brands such as Vichy and La Roche-Posay are notable for their science-based skincare products, which are frequently recommended by dermatologists. Since its foundation by Eugène Schueller, L'Oréal has been a pioneer in research, introducing advanced ingredients such as Ceramide R, Mexoryl SX and Pro-Xylane (L'Oréal, 2023).

The following section will present the data provided by Statista (2024), which indicates that in 2023 the total reached over 20 billion US dollars. Unilever, which has been in business for over a century and has a presence in 190 countries, is a company focused on the consumer goods sector. Its product range includes personal care, hygiene products, skin care and hair care, and it owns brands such as Dove, Axe, Rexona and TRESemmé. Additionally, the company operates in the food and beverage sector, encompassing products such as mayonnaise, teas, sauces, and ice cream. Its portfolio includes renowned brands such as Knorr, Lipton, and Hellmann's. Additionally, the company operates within the household cleaning sector, offering products that provide exceptional cleanliness and care. These include brands such as OMO, CIF and Comfort. In addition to its activities in these market segments, the company operates more than 280 factories and makes significant investments in technology and sustainability (Unilever - Fima, 2023).

In third place is The Estée Lauder Companies (ELC), which is a world reference in prestige beauty. The company offers a range of high-quality products, including those related to skincare, make-up, fragrances and hair care. Some of the brands associated with ELC include Estée Lauder, which specialises in prestige skincare and make-up; MAC Cosmetics, which is renowned for its extensive range of professional make-up; Clinique, which is particularly adept at developing dermatologically tested products; Bobbi Brown and La Mer, which offer luxury make-up and skincare; Aveda, which is a leading provider of hair care and wellness products that utilise natural ingredients; Jo Malone London, which is celebrated for its refined fragrances; and Tom Ford Beauty, which combines make-up and premium fragrances. The company is committed to innovation and positive social impact, with a particular emphasis on the advancement of women, sustainability and diversity. The company is proud of its legacy, which was founded by Estée Lauder in 1946, and is committed to advancing women, sustainability and diversity. It employs 80% women and 60% of its leadership positions are held by women.

Procter & Gamble (P&G) is a trusted and innovative company that has been present in the lives of millions of consumers for 181 years. It offers a range of products designed to care for people, families and homes. The company's leading brands, including Ariel and Mr Clean for domestic cleaning products; Head & Shoulders and Pantene in personal care; Oral-B and Crest in dental hygiene; Pampers for babies; and Herbal Essences in beauty, reflect its commitment to providing high-quality products. Furthermore, in addition to enhancing the quality of life and influencing cultural norms, P&G remains faithful to its core Purpose, Values, and Principles, which serve as the foundation for its distinctive organisational culture. These elements have remained consistent since the company's inception, providing guidance on its trajectory towards enhancing consumer experiences daily through incremental yet impactful enhancements. This framework motivates its employees to make a constructive contribution. P&G's purpose is to provide products and services that enhance the quality of life for consumers in the present and future. In addition, the company strives to foster sales leadership and value for its employees, shareholders, and communities. The company's values include integrity, leadership, ownership, a passion for winning, and trust (Procter & Gamble, 2023).

2.5. Market Trends

As demonstrated in the sector evolution graph 2, which can be consulted in Appendix 1, a decline was observed in 2021 due to the impact of the pandemic, which resulted in substantial shifts in consumer behaviour concerning cosmetic products (Babu, 2020). The prolonged

utilisation of masks during the pandemic period led to an increase in skin diseases and concerns among consumers, thereby directing attention towards skincare products (Rubin, 2020).

A salient contemporary concern in the cosmetics sector, which encompasses beauty and well-being, pertains to its substantial contribution to plastic waste. On average, individuals use ten plastic shower gel containers annually, amounting to approximately 75,000 tons of plastic. Most of these containers are discarded in landfills or enter the oceans, where they can persist for millennia (Drobac et al., 2020).

According to the European Environmental Agency's 2021 report, which provides a comprehensive analysis of the production, consumption, and trade of plastics and their environmental impact throughout the product lifecycle, three approaches are presented for the transition to a circular plastic economy: smarter use of plastic components, strengthening product circularity, and using renewable raw materials.

Due to the pandemic and growing awareness of the environmental impact of plastic packaging, companies are increasingly aware of the importance of environmental concerns for their success, as consumers are more attentive to health and the adoption of sustainable products (Liobikienė, 2017). Consumer concern is stimulating the market to respond to the growing demand for products that are not only effective but also adopt the principles of sustainable development, from ingredient composition to packaging, thus promoting advances in sustainability and quality (Trif, 2024).

This scenario necessitates the implementation of sustainable production and consumption solutions by the cosmetics industry. The starting point for this process is the definition of sustainability, which is understood as the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. The term is divided into three dimensions. Firstly, the environmental dimension, which encompasses the conservation and management of natural resources, particularly those that are non-renewable. Secondly, the social dimension, which includes human rights and the promotion of equal opportunities for all individuals within society. Finally, the economic dimension, which encompasses the prosperity of various societal levels and the efficiency of economic activities, including the capacity of organizations to generate wealth and promote decent employment (BCSD, 2024).

According to Euromonitor International (2024), the future of innovation in sustainability must prioritize authenticity, transparency, and tangible benefits, thereby fostering consumer trust and ensuring environmental protection.

However, for sustainability to be truly effective, it is essential to implement holistic solutions that consider multiple dimensions and all phases of the product lifecycle (Bom et al., 2020) and should not compromise value for money, performance, or quality (Euromonitor International, 2024). Nevertheless, in the cosmetics sector, companies face difficulties in implementing comprehensive sustainability, focusing mainly on environmental aspects and neglecting economic and social dimensions (Bom et al., 2019).

Finally, a market trend that has been identified is the location of product purchases. There has been an increase in online purchases. According to a Eurostat study (2023), 44% of the European population purchases "clothing, footwear, and accessories" online, signifying an increase compared to 2022. The second most purchased item online by consumers in 2023 was "restaurant or fast-food" services. The third most purchased item was "cosmetics and beauty products," with 18% of online EU consumers purchasing them in 2023.

The trend of online purchases of cosmetic products emerged first in Sweden, Italy, and Norway. Moreover, most European consumers purchase personal care products at a frequency of once a month or once every two or three months (Cirro E-commerce, 2024).

2.6. Portuguese Market

Following an analysis of the global beauty product market, it is imperative to concentrate on the Portuguese context, a subject which this study will analyse by focusing on female Portuguese consumers, a segment which is showing a promising scenario. The projected annual growth rate for the period 2024-2029 is 1.42%, suggesting gradual and consistent growth in this sector (Statista, 2024). As presented in the market trends, in Portugal, there is an increasing demand for natural beauty and well-being products, reflecting growing concerns about sustainability and the pursuit of environmentally friendly lifestyles. This trend not only underscores the evolution of consumer preferences but also highlights the importance of offering more sustainable options in this market.

The Portuguese market is segmented into five primary categories: cosmetics, skincare, haircare, fragrances, and beauty technology. Excluded categories include beauty services, such as hairdressing services, and professional products. Furthermore, medically focused products are

excluded from this analysis, as they are considered part of the over the counter (OTC) pharmaceutical market (Statista, 2024).

As previously discussed on a global scale, the present analysis is informed by a survey on the use of information technology conducted by INE (National Institute of Statistics) in November 2021. This survey suggests that Portuguese society exhibits a high rate of e-commerce use, particularly among female demographics. In 2021, a significantly higher proportion of women (43.2%) used e-commerce compared to men (37.4%). The most prevalent categories ordered were clothing, footwear, and fashion accessories (69.0% in 2021), takeaway meals or home delivery (46.0% in 2021), and films, series, or sports programs (34.9% in 2021).

Of the five segments, the haircare market is considered one of the largest in the cosmetics sector, showing constant evolution in recent years. In the context of a mature market, companies must innovate to maintain competitiveness (Cunha, 2017). The haircare market in Portugal is characterized by four key dimensions. From a product perspective, the market is segmented into seven categories: sprays, lotions, hair colorants, anti-dandruff shampoos, mousses, texturizers, serums, conditioners, and shampoos. With respect to pricing, the market is divided into mass or premium segments. In terms of packaging material, the market is subdivided into flexible packaging, glass, metal, and rigid plastics. The distribution channels for this segment include convenience stores, supermarkets and hypermarkets, small grocery stores, health and beauty stores, direct sales, e-commerce, and hair salons.

The market's stabilisation after five years of decline can be attributed to the positive performance of the two strongest product types in this segment: conditioners, with increased demand driven by mask use, and traditional shampoos, with increased demand for sulphate- and salt-free shampoos (Rodrigues, 2019).

The haircare market in Portugal is structured as follows: In terms of product typology, the market is segmented into seven distinct categories: sprays, lotions, hair colorants, anti-dandruff shampoos, mousses, texturizers, serums, conditioners, and shampoos. With regard to price, the market is segmented into two primary categories: mass or premium. The packaging material is subdivided into flexible packaging, glass, metal, and rigid plastics. The distribution of this segment encompasses various channels, including convenience stores, supermarkets and hypermarkets, small grocery stores, health and beauty stores, direct sales, e-commerce, and hair salons. The transformation and expansion of e-commerce has led to the development of online

platforms that offer consumers a wide range of products, including niche and international brands (Strategy&, n.d.).

The Portuguese haircare market has shown signs of stabilisation after a period of decline that lasted five years, a development that can be attributed to the positive performance in the conditioner category, as well as the stabilisation of the traditional shampoo category. A notable trend that has emerged is the increased demand for sulphate-free and salt-free shampoos among consumers. Furthermore, Rodrigues (2019) has observed a shift in consumer preference, with conditioners and conditioning treatments, such as masks, gaining greater popularity compared to styling creams.

With respect to the distribution channels of this segment, the new transformation and expansion of e-commerce, and the development of online platforms offering consumers a wide range of products, including niche and international brands, are noteworthy (Strategy&, n.d.) A notable evolution in online and offline purchases between 2018 and 2029 in Portugal indicates that offline channels maintain a strong presence, with values consistently above online channels (Statista, 2024). However, a salient observation is the steady and continuous growth of online purchases. A comparison of annual data reveals a discernible increase in online purchases, indicating a marked shift towards e-commerce. This phenomenon can be attributed to an increasing consumer inclination towards online cosmetics purchases, a trend that has been propelled by the enhancement of the digital shopping experience and the deployment of effective online marketing strategies (Statista, 2024). Sharma (2024) further elaborates on this trend in their article on LinkedIn, underscoring the advantage of online channels in providing a vast array of options, enabling consumers to explore and compare a diverse range of hair products.

L'Oréal Paris, the preeminent brand in the Portuguese cosmetics sector, exemplifies this commitment to innovation and environmental responsibility. The company has adopted a comprehensive eco-design approach for its packaging, refraining from animal testing and prioritising sustainability. To assess the environmental impact of its products, the brand has implemented several strategies, including the use of the Sustainable Product Optimization Tool (SPOT), incorporation of recycled materials, and reduction of packaging quantity. Despite these efforts, the company continues to innovate, with three key objectives: a 20% reduction in packaging compared to 2019, the use of recycled or bio-based plastic in all its packaging by

2025, and the introduction of refillable, reusable, recyclable, or compostable packaging by 2025 (L'Oréal, 2023).

3. Literature review

3.1. Circular economy

According to Auras and Selke (2022), the circular economy is an economic model that promotes sustainability and environmental protection by creating a regenerative system in which material inputs and waste generation are significantly reduced.

This economic model is based on three fundamental principles: eliminating waste and pollution, circulating products and materials, and regenerating nature. These principles aim to create a closed loop of resources where efficient use minimises environmental impact and promotes sustainable practices (Ellen MacArthur Foundation, n.d).

Moreover, the notion of the circular economy has been expanded by the integration of the R's, which has evolved from three concepts (Reduce, Reuse and Recycle) in 2020 to twelve 'R's' emphasised by Modak in 'Practical Circular Economy'. These additional 'R's' encompass Redesign, Rethink, Refuse, Reduce, Reuse, Return, Recycle, Recover, Remanufacture, Repair, Renew and Refurbish. Each of these elements plays a crucial role in reducing waste and increasing the efficiency of resource use (Modak, 2021).

3.2. Packaging

Packaging plays a crucial role in industrial operations and consumers' daily lives, representing a significant portion of the sector's environmental impact, from production to disposal. Fundamental to the value chain, packaging ensures that products circulate globally and reach consumers (Hellström & Olsson, 2016).

Packaging is traditionally classified into three categories: primary, secondary, and tertiary. Primary packaging directly encloses the product, ensuring its protection and presentation. Secondary packaging, such as boxes and blisters, facilitates transport and handling by grouping units of primary products. Tertiary packaging, such as pallets and containers, optimizes the logistics of handling and storage of secondary products (Emblem & Emblem, 2014).

The materials used in packaging vary according to the specific needs of each product, with plastic, paper, metal, and glass being the most common (European, 2021). However, the choice of ecological materials, such as recycled cardboard and glass, along with the reduction of plastic use, the development of reusable packaging, and the encouragement of recycling, are vital measures to reduce the industry's environmental impact (Wechselberger, 2024).

3.3. Sustainable Packaging

As consumers become increasingly concerned about the environmental impact of plastic packaging, there is an increasing demand for sustainable packaging solutions. Such packaging is designed to be used for the same purpose for which it was originally intended, without the need for additional processing, apart from cleaning. Refillable packaging is designed to minimise the number of times it is transported through the reuse system (District Refill, 2024).

One of the European Union's major concerns currently is the legalization of sustainable packaging materials because, up to now, the concepts of sustainability and sustainable packaging are very vague for the consumer, making it difficult for them to make informed choices (Council of the European Union, 2024).

The correct use of sustainable packaging by brands can be an effective tool to promote a product, encouraging the use of materials from sustainable sources. When companies obtain certifications that guarantee the origin and sustainable production of these materials, they convey to consumers the confidence that they are contributing to a more sustainable future (Wechselberger, 2024).

In the contemporary business landscape, there is a discernible trend of brands allocating increased financial resources towards the research and development of natural products. This strategic move is underpinned by the growing demand of ecologically conscious consumers, a trend that has been extensively documented (Trif, L, 2024). A plethora of alternative products have emerged on a global scale, including the American company Pacific Shaving Co.'s shaving cream packaging, which dissolves in water, and the product designer Jonna Breitenhuber's SOAPBOTTLE, a biodegradable packaging made from soap. The concept behind SOAPBOTTLE is to utilise the product itself as the packaging, with each bottle of soap containing one litre of liquid and lasting for a period of one month. Following use, the bottle can be repurposed as a hand soap or detergent.

In Portugal, there are several innovative projects that promote sustainability and effective resource management. One such project is Oeste CIM, which aims to implement sustainable solutions in the communities of the West region, focusing on waste reduction and energy efficiency (Oeste CIM, 2023). Furthermore, the Fill Forever bottle, a product of EPAL's sustainability initiative, is designed to promote the reuse of water bottles, thereby encouraging

citizens to adopt more sustainable habits and reducing the use of disposable plastics (APEE,n.d.).

3.4. Consumer Behaviour

This consumer, concerned about future generations and seeking sustainable alternatives, has developed a new concept of green consumption, which consists of consumers adopting environmentally friendly behaviour and/or purchasing sustainable products instead of conventional alternatives. Sustainable products are considered those that will not pollute the earth or deplete natural resources and can be correctly recycled (Smith & Jones, 2021).

However, the general population has shown significant concern, observable in consumer behaviour, especially in the cosmetics industry, where consumers are becoming increasingly discerning about the factors influencing their purchasing decisions (Amberg & Fogarassy, 2019).

In 2018, the Cosmetic Toiletry and Perfumery Association (CTPA) highlighted that variables such as functionality, ingredients, packaging, fragrance, and price play critical roles in shaping consumer purchasing behaviour. The two crucial factors in sustainable purchasing behaviour are environmental awareness and price sensitivity. According to Liobikienė (2017), environmental and ethical issues are also gaining importance in purchasing decisions.

According to the study by Zdonek & Jaworska (2024), which investigates the factors influencing consumers' purchase intention to use refills for cosmetic products, it is concluded that ease of use and price are very strong factors influencing purchase intention.

3.5. Theory of Planned Behavior

The Theory of Planned Behaviour postulates that human behaviour is guided by three main components: attitude towards behaviour, which are behavioural beliefs, subjective norms also called normative beliefs and the perception of control over behaviour, which are control beliefs (Brookes, 2023).

Attitude toward the behaviour is the consumer's evaluation of a given behaviour. That is, if the consumer believes that the behaviour will bring positive consequences, their attitude will be favourable, increasing the likelihood of adopting it. Subjective norm, in turn, encompasses the individual's perception of social expectations and pressures they may feel regarding a behaviour. When those around them, such as family, friends, and influencers, support or adopt sustainable practices, this can motivate the consumer to follow similar behaviour. Furthermore,

perceived behavioural control refers to the perceived difficulty of performing the desired behaviour, including factors that may facilitate or hinder its adoption (Ajzen, 1991).

These beliefs, together, produce different reactions: behavioural beliefs lead to a favourable or unfavourable attitude toward the behaviour; normative beliefs result in perceived social pressure or subjective norm; and control beliefs generate perceived behaviour control or self-efficacy (Ajzen, 1991).

The effects of attitude and subjective norm on intention are moderated by perceived behaviour control. Generally, the more favourable the attitude and subjective norm, and the greater the perceived control, the stronger the individual's intention to perform the behaviour in question (Ajzen, 1991).

Finally, given a sufficient degree of actual control over the behaviour, people are expected to follow their intentions when opportunities arise. Thus, intention is considered the immediate antecedent of behaviour. When perceived behaviour control is valid, it can serve as an indicator of actual control, contributing to the prediction of the behaviour in question (Ajzen, 1991). The figure 1 is a schematic representation of the theory

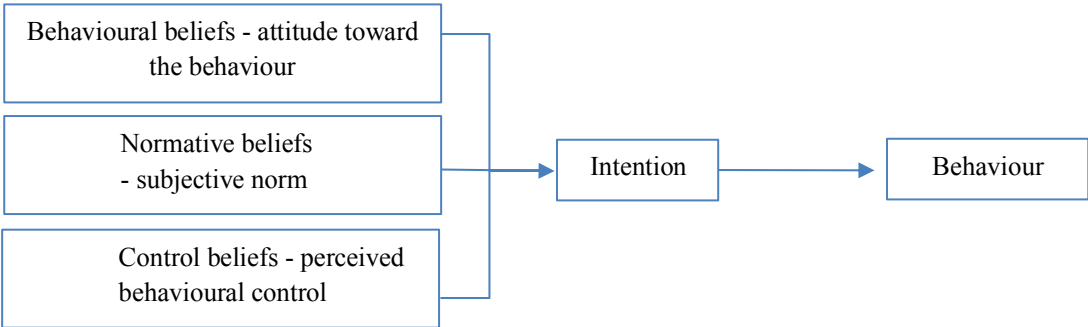


Figure 1 - Visual scheme of the Theory of Planned Behaviour

3.6. Communication

Digital media offers various platforms that can facilitate the creation of marketing strategies. It is important that these platforms are integrated into the company's strategies to achieve its objectives. When combined with traditional media, these platforms provide several interesting opportunities to influence consumer intention. According to Martha Gabriel (2010), there are different types of digital pages, including: Websites, Mini websites, Microsites, Portals, Blogs, Social Media Profiles, and Landing Pages.

According to Gabriel (2014), the use of digital platforms as a means of communication can have a strong positive impact on marketing objectives. The internet has the advantage of being a tool with a wide reach and viral potential, compared to traditional media.

Marketing must incorporate technological changes, new tools, and platforms (Torres, 2009). The focus of digital marketing is to develop market strategies through the internet, seeking the best way to integrate and connect with consumers, allowing for personalized and effective information exchange.

According to Mundstock (2021), who investigated how different brands communicate their shift in positioning to focus on sustainability, it was concluded that brands apply sustainability values in advertising narratives using traditional communication, community influencers, or when the brand alters its behaviour in production and distribution practices to reduce its environmental impact.

4. Problem Statement and Research Questions

Based on all the information gathered for this study, we will assume that a cosmetic product is a mixture created to come into contact with the external surfaces of the human body, such as skin, hair, nails, lips, and external genitalia, in addition to teeth and oral mucosa, in accordance with the European Union regulation.

This study will be carried out among Portuguese consumers. As already mentioned, this market is divided into five segments, and this study will focus on the hair care segment, more specifically shampoos.

Having analysed the global population, understanding environmental awareness and interest in adopting sustainable practices, particularly in the haircare segment (which may seem the easiest in terms of transitioning to refill systems that promise to reduce packaging waste), and considering the use of e-commerce in this sector, we will focus on consumers who use online channels to make their purchases in this sector.

However, this study will analyse the adoption of refill systems for shampoos among Portuguese female consumers and their barriers. We will also understand whether communication is a factor that influences the consumer.

To understand human behaviour and the factors that influence the consumer, we will use Icek Ajzen's 1985 Theory of Planned Behaviour, one of the most influential theories in social psychology focusing on purchase decision contexts.

In order to analyse what was intended, the following research questions and hypotheses are presented, in accordance with the literature review above:

RQ1: What factors influence the online purchase decision of shampoos using refill systems?

- H1: Ease of use is a decisive factor for purchase.
- H2: Environmental awareness is a decisive factor.

RQ2: How can communication about the sustainability of refill systems influence the purchase decision of Portuguese female consumers?

- H3: The influence of subjective norms increases the purchase intention of shampoos with refill systems among Portuguese female consumers.

5. Qualitative study

5.1. Methodology

To evaluate the hypotheses developed and, potentially, identify new hypotheses that may emerge, it is imperative to conduct a qualitative study. This study consists of qualitative interviews that involve open-ended, in-depth conversations with 10 individuals from the Portuguese population, five of whom are consumers of refill systems and five who are not. The sample for this interview ranges in age from 15 to 57 years and is predominantly female.

The interview addressed various topics related to the refill system, such as awareness, advantages and disadvantages, purchasing habits in the hair care sector, whether communication influences consumers, and the important factors that influence purchases. In the appendix 3, presented each interviewee and highlight some key points to justify what follows.

5.2. Findings

Regarding the first research question that addresses the factors that may influence the purchase, most responses highlight factors such as the capacity of the refill packaging compared to traditional packaging, ease of use (H1), and the price of the refill.

For the second research question, which discusses whether communication influences the purchasing decision, the responses were divided, as some individuals are influenced and think of specific examples, making purchases with this awareness, while others do not think the same way and do not recall any campaigns. One point to emphasize is the importance that family members have for the interviewees, as they indicate that this influences their decisions (H3).

On the factors that prevent consumers who are aware of this alternative from using it, the interviewees I selected, who do not use a refill system, mentioned obstacles such as the lack of points of sale in more accessible locations, insufficient knowledge on how to use the refill, and a lack of brand loyalty.

Other interesting points to highlight from this interview concern where to buy hair care products, where most interviewees revealed that they purchase online and in supermarkets. Among the five interviewees who use this alternative, there is a positive opinion regarding their experience, and they appreciate the lower price and the greater capacity of the packaging. Regarding how they learned about this alternative, participants indicated they discovered it

online, specifically on LinkedIn or on websites that sell products, while others encountered it in supermarkets.

It is also important to highlight that an extra question was asked about whether the brand is a deciding factor for purchasing this alternative. The responses were diverse; that is, older generations care about the brand, while younger generations are not guided by brands but rather by product performance and hair needs.

Another important conclusion from the interview highlighted a significant barrier in the hair care segment: most consumers seek products based on their performance and effectiveness rather than focusing on specific brands or ranges. This perception suggests an innovative opportunity for the market, such as creating a universal bottle that allows consumers to purchase refills of products, thus meeting their individual needs without the limitation of brand or packaging. This approach would not only promote sustainability but also provide a practical solution for consumers who prioritize quality above all.

The results indicate that, for most consumers, the comparison between refill packaging and traditional packaging, along with the price, are crucial factors in product choice, with family influences being an important aspect of purchasing decisions. Among the obstacles for those aware of refills are the lack of availability at accessible points of sale and insufficient knowledge about their proper use, highlighting the need for greater consumer education and improvements in distribution. The research also reveals generational differences in perceptions about brands: older consumers value notoriety, while younger ones prioritize effectiveness and necessity, suggesting a chance to develop a universal bottle that allows the use of refills from various brands, promoting sustainability and a more practical purchasing experience. Thus, the research underscores the importance of implementing more effective communication and distribution strategies that meet consumer expectations, reinforcing education about products and strengthening social networks for the promotion of refill systems.

6. Quantitative study

6.1. Methodology and Data

The objective of the research is to gain insight into the behaviour of Portuguese female consumers about innovation. To this end, an online survey was conducted, comprising four sections and a total of 22 questions. The initial section encompasses demographic data, including age, gender, educational attainment, and the frequency of purchasing hair products. The second part of the questionnaire examines the technology of refill systems, with consumers being asked about the places they acquire hair products and their use of this technology. The third section investigates communication and the Theory of Planned Behaviour, while the last part seeks to identify the factors that influence the decision to purchase refill shampoo, all the questions can be found in appendix 4. The questionnaire was available for completion from 2 to 5 December 2024, resulting in the collection of 221 responses.

6.2. Data cleaning

Prior to undertaking an analysis of the questions posed, it was necessary to undertake data cleaning. This entailed checking for missing values, outliers and renaming the types of variables to facilitate subsequent analysis.

About outliers, the Mahalanobis distance technique was employed due to its capacity to enhance statistical quality and reliability, particularly in the context of considering the covariance structure of variables and identifying multivariate outliers. To ensure the integrity of the analysis, all values below 0.001 and their corresponding rows were removed from the dataset. Ultimately, 13 responses were deemed invalid, leaving 208 valid responses for the survey.

6.3. Sample Characterization

The survey was disseminated on various social platforms, including Instagram, Facebook, and WhatsApp. A total of 221 responses were received, of which 13 were excluded due to incompleteness. The final sample consisted of 208 usable responses. Of the total number of participants, 158 were female and 49 were male.

About the age of the questionnaire sample, which ranges from 14 to over 78, the following table shows the data, which, if we look at it, we can conclude that the majority of participants are aged between 14 and 27.

Table 1 - Age Distribution of Participants

Age	Percentage
14-27 years	45.2%
28 – 43 years	27.4%
44- 59 years	18.3%
60 – 78 years	8.2%
Over 78 years	1%

About the participants' educational background, the majority have completed at least a higher education qualification (52.4%), 29.8% have pursued postgraduate studies, including specializations, master's degrees and doctoral degrees, 11.5% have obtained a secondary education qualification, and 6.3% have pursued vocational education.

A review of the frequency with which hair products are purchased revealed the following distribution of participants: The largest proportion of the group (39.4%) makes its purchases every three months. Subsequently, 25% of respondents indicated that they make their purchases monthly, while 23.6% stated that they make their purchases every six months. Annually, 8.7% of participants typically make purchases, while only 3.4% opt for bi-weekly purchases. This distribution demonstrates that the majority of consumers tend to make purchases of hair products at more regular intervals, with significantly less frequency of bi-weekly purchases.

The sample size for the subsequent questions is reduced due to the questionnaire's focus on female participants. Consequently, the sample consists exclusively of 157 women. It can be deduced that 57.3% of respondents purchase their hair products in physical stores, while only 42.7% make online purchases.

About the central question of this study, which inquires whether the participants have ever purchased a refill system package for their shampoo (Q6), it can be concluded that among the 157 women who took part in this study, only 31.2% have purchased refill systems for hair shampoo. The majority of participants (68.8%) did not purchase this alternative to traditional packaging.

Of the 49 participants who indicated that they have purchased refill systems, the majority described their experience as positive with regard to the refill packaging. In terms of the functionality of the packaging, the analysis reveals a clear pattern: the majority of evaluations

fall into the category of moderately functional (34.6%), while negative ratings were also mentioned, albeit with a low level of significance.

Of the 108 participants who responded to question 6, indicating that they do not purchase refill systems for shampoos, the reasons that prevented them from trying such products include concerns about product quality, difficulty in finding these options in their usual shopping locations, and a preference for traditional systems that offer greater convenience. Furthermore, it was observed that consumers may be interested in trying other ranges and brands.

Regarding the means by which participants became aware of refill systems as opposed to traditional systems, an analysis was conducted of the same question among those who had and had not purchased refill systems. The findings revealed that the majority of participants had learned about refill systems through websites. However, it is noteworthy that a significant proportion of participants who had never purchased refill systems for shampoo products had become aware of them through social media (28.2%).

About the perceived advantages of refill systems, both users and non-users of the technology espouse similar views, namely that they are sustainable, cost-effective and convenient.

As the innovation under study pertains to sustainability, the online questionnaire also posed questions to consumers concerning their relationship with sustainability. It can therefore be concluded that about the frequency with which discussions about sustainability take place within their social circle, the most frequently selected response was "occasionally". In response to the retrospective question regarding awareness of environmental issues, participants indicated a positive outlook, with the majority self-identifying as moderately or fully conscious of environmental concerns. In conclusion, the majority of respondents recognize the importance of awareness campaigns in influencing purchasing decisions, indicating that such campaigns can positively influence purchasing behaviours.

In order to analyse questions Q14 and Q23, which inquire about the factors influencing the consideration of purchasing a shampoo in a refill system, a factor analysis test was conducted. This method allows for the grouping of correlated variables into smaller factors, thereby facilitating the revelation of patterns and relationships among them.

Prior to conducting the tests, seven new variables were created, representing the sum of questions 14 and 23 on the same theme. The table below describes the aforementioned new variables.

Table 2 - Variable Creation for Factor Analysis

Components	Questions	New variable
Price	Q14_1, Q23_1	Q14eq23_price
Packaging capacity	Q14_2, Q23_2	Q14eq23_capacit.
Ease of use	Q14_3, Q23_3	Q14eq23_uso
Brand	Q14_4, Q23_4	Q14eq23_marca
Promotion or discount	Q14_5, Q23_5	Q14eq23_desconto
Composition and ingredients	Q14_6, Q23_6	Q14eq23_ingred.
Environmental sustainability	Q14_7, Q23_7	Q14eq23_envorm.

Following the introduction of the seven new variables for the purposes of conducting the test, an examination was undertaken of the Kaiser-Meyer-Olkin (KMO) Measure table. It was determined that a value of 0.6 or above is generally indicative of an acceptable basis for proceeding with factor analysis. The resulting value from this analysis is 0.641, which is therefore deemed to be acceptable. With regard to Bartlett's Test of Sphericity, the approximate chi-square is 105.748 with 21 degrees of freedom and a significance level of less than 0.001.

Subsequently, the Rotated component matrix was analysed, resulting in the identification of three significant factors pertinent to the question at hand.

Factor 1 is comprised of the component's environmental sustainability, brand, and composition and ingredients, which have been designated FAC1_sustainability.

Factor 2 is constituted by the variables packaging capacity and ease of use, which have been renamed FAC2_functionality.

Factor 3 comprises of price and promotional discounts, which have been designated as FAC3_costs.

To ascertain the extent to which communication regarding sustainability exerts an influence on the decision to purchase, an analysis was conducted on questions 22 and 13. These questions are measured using a Likert scale that is divided into five levels, ranging from 'no influence' to

'very much influence'. The responses obtained were found to be very precise. Among consumers, 42.2% of those who purchase refill systems and 45% of those who do not purchase them stated that communication regarding sustainability moderately influences their purchase decision, while the remaining 12.8% stated that it greatly influences their purchase decision.

6.4. Cronbach's Coefficient Alpha

Prior to testing the hypotheses, the reliability of the questionnaire was validated using Cronbach's Coefficient Alpha, a measure of internal consistency that evaluates the reliability of the questionnaire. This coefficient is typically used to determine how well the items in a scale measure the same underlying concept, and an alpha value above 0.7 is generally considered acceptable, with values above 0.8 indicating good reliability and values above 0.9 indicating excellent reliability.

Table 3 - Cronbach's Alpha: Questionnaire Reliability

Predictor	Number of items	Cronbach's Coefficient Alpha	Variables
Ease of use	4	0,780	Q14_3, Q14_3,Q8, Q7
Environmental sustainability	4	0,780	Q14_7, Q23_7, Q15, Q24
Subjective norms	5	0,610	Q10_4, Q19_4,19_5, Q25, Q16

The reliability analysis, employing Cronbach's Alpha coefficient, evaluated the internal consistency of three constructs: Ease of Use, Environmental Sustainability, and Subjective Norms, which function as independent variables in the research framework. The findings suggest adequate reliability for Ease of Use ($\alpha = 0.780$) and Environmental Sustainability ($\alpha = 0.780$), indicating that the items measuring these constructions are consistent and assess the same concept. In contrast, the alpha value for Subjective Norms ($\alpha = 0.610$) demonstrated acceptable reliability but fell below the generally accepted threshold of 0.7, suggesting the need for a review of the items comprising this construct to enhance its internal consistency. It is noteworthy that alpha values above 0.7 are typically considered adequate; however, values below this threshold, as observed in the case of Subjective Norms, necessitate a cautious interpretation of the results.

Given the value of the Subjective Norms factor, which is 0.610, a factor analysis was performed on the variables that comprise it with the objective of rectifying the variable. It is important to note that a factor loading above 0.5 indicates that the factor is significant for the variable. With regard to the table below, it should be noted that the variables have a sum of questions because the questionnaire is divided into two parts: one for people who purchase refill systems and one for those who do not purchase, but the questions are the same for both groups. The objective is to study the variable of this question, and therefore the sum of the two questions that ask the same thing is calculated to obtain the sample size (N).

Table 4 - Subjective Norms: Factor Loadings after Rectification

Predictor	Variable	Factor loading
Subjective norms	Q10_4 + Q19_4	0,724
	Q19_5	0,675
	Q25 + Q16	0,729

As demonstrated in the above table, it can be concluded that all factors are important, and therefore cannot be removed.

Following this analysis, the independent variables will be created according to Cronbach's Coefficient Alpha, as presented below in the table 5 with more detail:

Table 5 - Independent Variable Construction

RQ		Variable	New variable
RQ1	Ease of use	Q14_3, Q23_3, Q8, Q7	Ease_use
	Environmental sustainability	Q14_7, Q23_7, Q15, Q24	envr_sustainability
RQ2	Subjective norms	Q10_4, Q19_4, Q19_5, Q25, Q16	subj_norms

At the same time, the dependent variables will be created in order to analyse what is intended. For the initial research question, which pertains to the decision to procure refillable shampoos from a website, I have devised a dummy variable derived from question 6 (Have you ever purchased a refill system package for your hair shampoo?). For the second research question,

which addresses the extent to which communication about the sustainability of refill systems influences the purchase decision for shampoos, I created the sum of the responses from question 22 in version 2 and question 13 in version 1 (To what extent does communication, in general, about the sustainability of refill systems influence the purchase decision for hair products, such as shampoos?).

6.5. Findings

To understand the influence of factors such as ease of use and environmental awareness on the purchase decision of refill systems, a logistic regression model was conducted. This is a statistical method used to model the probability of a binary outcome (purchase or no purchase of a refill system) based on one or more predictor variables (Sperandei, 2013).

A salient characteristic of this model is that when a variable possesses more than two levels, it is necessary to utilize dummy variables to represent it. A dummy variable is defined as a binary variable (0/1) that signifies the presence or absence of a specific category (Sperandei, 2013). In this instance, the sixth question of the survey was employed, which inquired whether the respondent had ever procured a refill system package for their hair shampoo. A response of 1 indicated a positive purchase history, while a response of 0 indicated a negative purchase history.

To analyse the first hypothesis, which states that the ease of packaging is a decisive factor in purchasing, we obtained a sample of 65 participants. Table 6 shows the data obtained in each of the tests, leading to the conclusion that this hypothesis is rejected. Starting the analysis with the omnibus tests of the model coefficients, which aim to test the hypothesis that all the coefficients in the equation are zero, the p-value above 0.05 indicates that the model does not present a significant result. In the model summary table, which consists of two tests with the same purpose, the Nagelkerke R^2 test ranges from 0 to 1, indicating that the model explains approximately 0.9% of the variation in the dependent variable. The analysis of the table of the Hosmer and Lemeshow test, which aims to verify whether there are significant differences between the classifications made by the model and the observed reality, tries not to reject the hypothesis that there are no differences between the predicted and observed values.

The results indicate a significant lack of fit of the model to the data, suggesting that the model does not accurately predict the purchase decision factors. In theory, when evaluating the variables in the equation table, the B-value tells us how much the depth variable should change

if the independent variable increases by one unit. Therefore, if it is a positive number, it has a positive effect on the depth variable and is considered statistically significant if the p-value is less than 0.05, meaning that it contributes significantly to the model. In this case, the coefficient for ease of use (-0.187) is negative, indicating a negative association with the purchase decision. However, the significance (Sig. = 0.522) indicates that this relationship is not statistically significant. This means that the effect of ease of use on the purchase decision is not significant enough to be considered.

Table 6 - Logistic regression results for hypothesis 1

N	65
Omnibus Tests of Model Coefficients	
P-value	0,521
Model summary	
Nagelkerke R ²	0,009
Teste Hosmer and Lemeshow	
χ^2	17,081
Df	4
P-value	0,002
Variables in the Equation	
Coef. B	- 0,187
Significance (Sig.)	0,552

With regard to the second hypothesis, which states that environmental awareness is a determining factor, all the results of the tests are presented in Table 7 and it is concluded that this hypothesis is rejected, although the data from the omnibus tests of the model coefficients show a significant improvement. When analysing the model summary table, which consists of two tests with the same purpose, the Nagelkerke R² test ranges from 0 to 1; in this case, the model explains only a small part (3.1%) of the variation in purchase decisions. The table of the Hosmer and Lemeshow test, which aims to check whether there are significant differences between the classifications made by the model and the observed reality, trying not to reject the hypothesis that there are no differences between the predicted and observed values, shows a good fit of the model to the data. In theory, when evaluating the variables in the equation table, the B-value indicates how much the depth variable should change if the independent variable increases by one unit.

Therefore, if it is a positive number that has a positive effect on the depth variable, it is considered statistically significant if the p-value is less than 0.05, meaning that it contributes significantly to the model. In this case, the coefficient for ease of use indicates a positive association between concern for environmental sustainability and the likelihood of purchasing a refill system shampoo. However, the p-value indicates that this positive association is not statistically significant. Based on this analysis alone, we cannot reliably conclude that a higher level of environmental concern leads to an increased likelihood of purchasing the product.

Table 7 - Logistic regression results for hypothesis 2

N	65
Omnibus Tests of Model Coefficients	
P-value	0,229
Model summary	
Nagelkerke R ²	0,031
Teste Hosmer and Lemeshow	
χ^2	3,428
Df	5
P-value	0,634
Variables in the Equation	
Coef. B	0,367
Significance (Sig.)	0,240

Following the rejection of both hypotheses, a factor analysis of the question in question was previously conducted, yielding three factors. However, a subsequent analysis of the two questions (23 and 14) that address the issue of the factors was conducted separately. The data was organised using a frequency table to analyse each component separately, and it was concluded that the factors considered important by both groups of consumers—those who purchase refill systems and those who do not—are price, promotion, and packaging capability.

To analyse the second research question, which addresses the impact of communication on the consumer's purchase decision, the third hypothesis was examined, which states that subjective norms influence the decision. This was done using a logistic regression model, a statistical method used to model the probability of a binary outcome (purchase or non-purchase of a refill system) based on one or more predictor variables (Sperandei, 2013). Table 8 shows the results of the tests.

The analysis concluded that the hypothesis is valid because the Omnibus Tests of Model Coefficients aim to test the hypothesis that all coefficients in the equation are null, and the model presents a significant relationship with at least one of the predictors. In this case, the subjective norms are significantly related to the outcome. After the continuation of the data analysis, the values from the model summary, composed of two tests with the same purpose, indicate that the Nagelkerke R² test ranges from 0 to 1, with a value of 0.156, suggesting a moderate explanatory power. This means that subjective norms explain only a small part of the variance in the purchase decision. The Hosmer and Lemeshow Test, which aims to verify whether there are significant differences between the classifications made by the model and the observed reality, attempts to not reject the hypothesis that there are no differences between the predicted and observed values. The results suggest that there is a lack of good fit between the model and the data. Theoretically, when assessing the Variables in the Equation table, the B value indicates the extent to which the depth variable should change if the independent variable increases by one unit. Therefore, if the B value is a positive number that has a positive effect on the depth variable, it is considered statistically significant if the p-value is less than 0.05, meaning it contributes significantly to the model. In this instance, the coefficient for subjective norms is positive, indicating a positive relationship; as subjective norms increase, the likelihood of purchasing refill shampoo increases. The p-value of 0.01 is highly significant, confirming the relationship.

Table 8 - Logistic regression results for hypothesis 3

N	65
Omnibus Tests of Model Coefficients	
P-value	0,005
Model summary	
Nagelkerke R ²	0,156
Teste Hosmer and Lemeshow	
χ^2	21,745
Df	8
P-value	0,05
Variables in the Equation	
Coef. B	0,947
Significance (Sig.)	0,001

Notwithstanding the absence of fit as indicated by the Hosmer-Lemeshow test, the finding for the variable "subj_norms" ($p < 0.01$) in the logistic regression suggests a positive association between subjective norms and the probability of acquiring refill shampoo. Consequently, the hypothesis (that subjective norms exert a positive influence on purchase intention) is not refuted. There is statistically significant evidence in support of the relationship, although the overall fit of the model is suboptimal.

7. Conclusions

7.1. Managerial Conclusions

This study investigated the adoption of sustainable refill systems for shampoos among Portuguese female consumers, who still exhibit a limited perception regarding innovation in the hair care sector. The findings reveal that, despite a high level of education and increasing environmental awareness, the adoption of shampoo refill systems remains lower than desired.

For Portuguese women consumers, the preference for physical stores and the interest in trying different brands, combined with concerns about quality and accessibility, represent significant barriers to the penetration of this type of packaging.

Regarding the factors influencing consumer purchase decisions related to refill systems in the hair care sector, these include price, promotional discounts, and packaging capacity, rather than factors such as ease of use and environmental awareness, which were initially deemed relevant but were ultimately rejected upon analysis. Further factor analysis, along with a detailed exploration of responses obtained from interviews, demonstrated that consumers prioritize practical and financial considerations in their decision-making, regardless of their adoption of the refill system.

Moreover, another significant finding was the influence of family on the consumer's purchasing decision, as evidenced by qualitative analysis, which reinforces the importance of subjective norms confirmed by the quantitative analysis, despite limitations in model fit. This social influence, demonstrated by the positive impact of communication and social perception on purchase intention, reveals the necessity for marketing strategies that consider both direct communication with consumers and the influence exerted by their social circles. Despite the current low adoption rate of refill systems, strategies focusing on competitive pricing, functional packaging, and increasing environmental awareness are crucial for enhancing accessibility, communication, and consumer education, thereby promoting sustainability within the sector.

This study demonstrates that price, promotional discounts and packaging capacity have a significant influence on consumer purchasing decisions regarding shampoo refill systems, outweighing the impact of environmental awareness and ease of use. While a significant proportion of respondents acknowledged the influence of sustainability communication on their

purchasing decisions, adoption rates remain low, indicating a discrepancy between awareness and action.

The findings of this study are particularly pertinent considering the mounting environmental consciousness and the introduction of the European Commission's novel Environmental Claims Directive. The new directive, which combats greenwashing and requires scientific proof of environmental claims, enhances transparency and credibility in the market, thus promoting a circular and sustainable economy in the beauty sector. The necessity for independent verification serves to emphasise the imperative for an eco-conscious approach, thus rendering the results of this study pivotal for the future of the sector.

7.2. Limitations and Future Research

The limitations of this study are as follows: firstly, the sample size, especially for the quantitative analysis, could be increased to enhance statistical power. A more diverse sample, encompassing a wider range of genders, ages, education levels and socioeconomic statuses, would enhance the robustness of the findings and facilitate a more nuanced understanding of consumer behaviour across different demographic segments. The present study's sample was constrained to female participants and to online shopping.

Secondly, the specification of the sector and product typology was limited. In this study, the focus is on the hair care sector, specifically shampoos, which may impose a limitation in understanding the consumer's choice of sustainable packaging because the type of product is so specific.

A notable limitation pertains to the absence of a standardised definition of sustainability and sustainable packaging within the European Union. This absence of clarity has the potential to influence consumers' perceptions and interpretations of these terms, thereby impacting the results and complicating the comparison of findings across studies that utilise divergent definitions.

It is therefore recommended that future research incorporates a clearer and more consistent operational definition of sustainability and the concept of sustainable packaging, using a standardised framework (such as those provided by the European Commission or other relevant regulatory bodies) to improve comparability and increase the reliability of the results on this topic.

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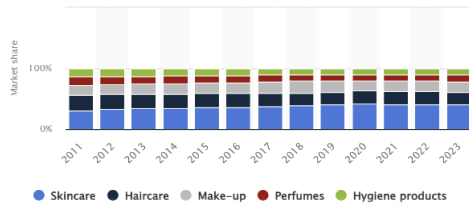
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9. Appendix

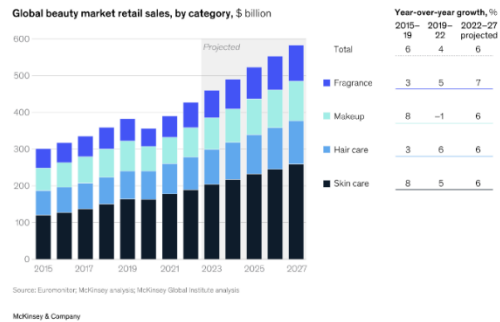
Appendix 1 - the sector evolution part

Breakdown of the cosmetic market worldwide from 2011 to 2023, by product category



Graphic 1 - Analysis of the global cosmetic market from 2011 to 2023 by product category (Source: Statista)

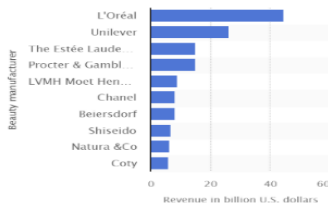
The four main beauty categories are projected to grow in the next few years.



Graphic 2 - The four main beauty categories are projected to grow in the next few years (source: McKinsey)

Appendix 2 - The world's leading brands

Revenue of the leading 10 beauty manufacturers worldwide in 2023 (in billion U.S. dollars)



Graphic 15 - Recipe from Top 10 Beauty Product Manufacturers (Source: Statista)

Appendix 3 - Details on the Qualitative Analysis

The first five interviewees are regular consumers of refill systems.

Interviewee A, 19 years old and a student – In the interview addressing the active purchase of the refill system, sustainable communication, and the underlying advantages, the student stated that she usually buys hair care products regularly, whether in supermarkets or online at Primor and Wells. It is also noted that she uses the refill system and appreciates the experience but finds the packaging somewhat impractical, thus opting for traditional products. However, in general, the refills offer greater quantity at a lower price. This student is concerned about the environmental downsides of this alternative, being aware that the packaging still contains plastic. Regarding communication about sustainability and refill systems, she does not feel particularly influenced in her purchasing decisions, mentioning that the only sustainable practice she adopts is recycling packaging. However, regarding being influenced by sustainability campaigns or messages, the interviewee recognized that she has felt impacted,

especially concerning products that are not biodegradable, such as shower gels, which pollute when discarded. She highlighted her awareness of the environmental impact of these products. When questioned about using sustainable products, such as refill systems, the student stated that she believes this has a positive impact on the environment, justifying that these systems help reduce plastic consumption since they use less packaging. Finally, the interviewee does not believe that the opinions and behaviours of friends and family influence her purchasing decisions regarding sustainable products. Similarly, the presence of influencers or public figures on social media has not affected her consumption choices in this context.

Interviewee B, 52 years old and a teacher – In the interview about the active purchase of the refill system, sustainable communication, and underlying advantages, she stated that she usually buys hair products in various locations, depending on her needs, but emphasizes online for recognized brands. The teacher uses refill products and really likes the concept, appreciating the quality and quantity of the product and the environmental awareness of not bringing more polluting packaging into her home. The teacher is concerned about the packaging's performance, as her past experience was not good because the closure broke. Regarding the factors that influence her, the price of the product and the brand are important, as she feels happier when the brand aligns with her values. Regarding sustainability communication, especially in the context of refill systems, there is a significant impact on her purchasing decisions. She expressed being influenced by this communication, as she feels that using such products contributes to environmental preservation. Furthermore, her curiosity for new products and their uses leads her to try new offerings presented by the media. The teacher reported being influenced by sustainability campaigns and messages on several occasions, including discovering that Bodyshop launched refill products, which motivated her to make a purchase. The participant firmly believes that using sustainable products, such as refills, positively impacts the environment, as reusing packaging helps avoid excessive resource consumption and reduces the ecological footprint, demonstrating her concern and commitment to sustainability. Additionally, she values the opinions and behaviours of those around her, such as friends and family, stating that she often tries sustainable products recommended by them. This indicates an openness and interest in adopting solutions that contribute to environmental preservation. Regarding social media, she does not feel as influenced by public figures or influencers as by the opinions of those close to her. However, she mentioned that occasionally, she may develop an interest in products recommended online, but she exhibits a certain

skepticism about recommendations that may be driven by advertising campaigns. She prefers to investigate more about products that seem to help promote good sustainability practices.

Interviewee C, 20 years old and a student – In the interview, she stated that she usually buys hair care products regularly online at stores like Shampoo Store or Primor. This participant uses the refill system for shampoo or shower gel. She discovered this alternative for sale on websites and in supermarkets. The factors that most influence her choices are the product capacity of the packaging, reducing waste after use, and it ultimately being more economical. She emphasized the importance of presenting convincing reasons and concrete data, such as the percentage of plastic reduction, to encourage more sustainable choices. When asked if she has felt influenced by campaigns or messages related to sustainability, the interviewee responded negatively, asserting that there has been no impact in this regard on her purchasing decisions. The interviewee believes that sustainable products, like refill systems, have a positive impact on the environment. However, she expressed concerns about the effectiveness of recycling in Portugal, indicating that she believes products are often not recycled properly. Regarding the influence of the opinions and behaviours of those around her, she stated that her environmental awareness is reinforced by her family's recycling habits, which educate and encourage good practices. Finally, when addressing the influence of social media, the interviewee also said that she does not feel impacted by the advice of public figures or influencers, indicating that these types of recommendations are not relevant in her purchasing decisions.

Interviewee D, 24 years old, manager – In the interview, she stated that she usually buys hair care products on online platforms like Shampoo Store. She learned about this alternative through LinkedIn. Regarding concerns about this alternative, the interviewee is worried about the packaging's performance. The factors that most influence her choice are the product capacity of the packaging. She considers herself quite sensitive to messages addressing this topic, indicating concern about the environmental impact of the products she consumes. When asked if she has felt influenced by campaigns or messages related to sustainability, the interviewee confirmed that she has, although she did not provide a specific example. She simply stated that these messages have impacted her purchasing choices over time. Regarding the use of sustainable products, like refill systems, the interviewee firmly believes that this makes a significant difference, as it allows for a reduction in the use of non-reusable plastic, contributing to waste reduction and, consequently, to less plastic waste. She also considers that the opinions and behaviours of friends and family play an important role in her purchasing decisions. She

showed openness to experimenting with new solutions recommended by people close to her that contribute to practices of saving and reuse. On the other hand, regarding the influence of social media, the interviewee stated that she does not feel influenced by the advice of public figures or influencers about sustainability, indicating that her purchasing decisions are more guided by information and recommendations from people close to her.

Interviewee E, 57 years old, hairdresser – In the interview, she stated that she usually buys hair products at the hairdresser or online to obtain high-performance products according to her needs. Regarding the refill packaging experience, she was not dissatisfied, as the closure of the packaging broke and she could not transport it to other places, but one factor she liked the most was the price concerning the quantity of product in the packaging. Therefore, one of her concerns is about the performance of the packaging and the material it is made of. She also emphasizes that the factors that most influence her choice are promotional discounts and the brand, but reiterates that what influences her the most is the product's performance and her needs. Concerning refill systems, she mentioned that she does not consider herself easily influenced in this regard, partly because she does not see many advertisements on the topic. When asked if she has ever felt influenced by sustainability campaigns or messages, she confirmed that, on some occasions, she has felt impacted but highlighted that these campaigns did not lead her to make purchases; instead, they encouraged her to explore the subject further. Regarding the use of sustainable products, like refills, the interviewee stated that she believes this has a positive impact on the environment, stressing that this practice helps reduce plastic use. Concerning the influence of friends and family, the interviewee mentioned that she appreciates knowing the opinions of those around her but does not consider that these opinions directly influence her purchasing decisions. Instead, it encourages her to investigate more about sustainable products. Finally, when addressing the influence of public figures or influencers on social media, the interviewee stated that she does not feel influenced by this advice, which indicates a preference for seeking information independently.

The next five interviewees do not purchase refill systems.

Interviewee F, 38 years old, Biologist – In the interview, she stated that she usually buys products in supermarkets and knows about the alternative through online platforms. One of the advantages she sees in this alternative is that it is practical and more sustainable. What prevented her from trying it was the lack of availability of this format in the supermarkets where she shops. The biologist emphasizes that the factors that most influence her choice are

significant discounts. She stated, without a doubt, that she considers this factor important. When asked if she has felt influenced by sustainability campaigns or messages, she cited a specific example: her choice to avoid disposable coffee capsules, indicating a desire to choose more sustainable alternatives. The interviewee believes that using sustainable products, like refill systems, has a positive impact on the environment, arguing that it theoretically reduces the number of packages and dispensers, resulting in less use of natural resources. Regarding the influence of opinions from friends and family, she expressed that she appreciates receiving feedback from those around her, which helps her make more informed decisions. Finally, when it comes to the influence of public figures or influencers, the interviewee mentioned that her perception depends on the type of influencer. She also highlighted the importance of consulting more than one opinion before making decisions, showing a critical and reflective approach.

Interviewee G, 22 years old, Manager – In the interview, she stated that she usually buys products on online platforms and knows about the alternative through social media. One of the advantages she sees in this alternative is the capacity of the packaging and that it is more economical. What prevented her from trying it was the lack of solutions for all the products she uses in her routine and because she varies greatly in the products depending on the performance she wants to achieve. Regarding the factors that most influence her choice, it is the capacity of the refill packaging compared to traditional packaging. Additionally, this interview revealed an obstacle concerning hair care purchases, as she does not always buy the same range or brand; she emphasizes that she looks for the product based on performance and not brand or type of packaging. Regarding communication about sustainability, especially concerning refill systems, it can influence her purchasing decisions, but only if the effectiveness and environmental impact are proven. She indicated that if this information is clear and valid, she might consider making a purchase. When questioned about sustainability campaigns or messages that have influenced her, the interviewee stated that she does not recall any specific examples and did not feel particularly impacted by them. About using sustainable products like refills, the interviewee believes that this only has a positive impact if the refill packaging has a greater capacity than standard packaging. This condition suggests that the effectiveness of sustainable solutions should be well evaluated to have a real impact. She also mentioned that the opinions and behaviours of people around her, such as friends and family, make her more conscious of sustainable products and practices, recognizing that these influences affect her decisions. Lastly, when addressing the influence of public figures or influencers on social media, the interviewee declared that she does not feel affected enough to make purchases based

on these recommendations, demonstrating a critical approach to marketing and communication in these channels.

Interviewee H, 28 years old, Consultant – In the interview, she stated that she usually buys products on websites like Primor and Perfumes Club and knows about the alternative through those websites. One of the advantages she sees in this alternative is that it is economical and has less plastic in the packaging. What prevented her from trying it was not knowing how to use the refill, whether she needs to make an effort to transfer it to another container or if she can use the refill as the main packaging, but she also emphasizes that she likes to use different shampoos with different performances. Finally, she notes that the factors that most influence her choice are undoubtedly the price and the detailed explanation of how to use the refill. Additionally, this interview revealed an obstacle in buying hair care products, as she does not always buy the same range or brand, emphasizing that she looks for the product based on performance and not brand or type of packaging. Therefore, she suggests creating a universal container that can be washed so that consumers can buy refills with the product they desire for the performance they want, regardless of brand and range. Furthermore, she highlighted that by presenting reasons and concrete data about reducing plastic use, communication can affect her awareness and choice of products. When asked if she has felt influenced by sustainability campaigns or messages, the interviewee mentioned that she frequently buys recycled paper, being influenced by the information on the packaging indicating that it is recycled. However, she does not consider herself very influenced by advertising messages or campaigns in general. The interviewee believes that using sustainable products, like refills, has a positive impact on the environment, but stresses that this only happens if there is a regular commitment to recycling. This concern about recycling is crucial for sustainable practices to have a real effect. Regarding the influence of friends and family, the interviewee stated that her family, especially her father, exerts a strong influence on her purchasing decisions. If her father uses a product, she tends to want to use it too, associating the brand and product with quality. This dynamic reflects an environmental awareness shared within her family. Finally, when addressing the influence of social media, the interviewee stated that she does not feel affected by the advice of public figures or influencers, noting that she does not even remember such recommendations, indicating a disconnect from this type of influence. In summary, the interviewee demonstrates environmental awareness driven by concrete information and the positive influence of her family, but remains sceptical of marketing strategies and the effectiveness of messages promoted by influencers on social media.

Interviewee I, 40 years old, teacher – In the interview, she stated that she usually buys products in stores like Wells or Primor and knows about the alternative through those websites. One of the advantages she sees in this alternative is that it is practical and offers more quantity of packaging. What prevented her from trying it was her concern about the performance of the packaging and how to use the refill. Regarding the factors that most influence her choice, a significant discount is important. Concerning refill systems, they have a significant impact on her purchasing decisions. She considers it essential to buy these products as a way to teach her children to care about environmental issues. When asked if she has felt influenced by campaigns or messages about sustainability, the interviewee confirmed that she has. She cited specific examples, such as the choice of diapers for children and the use of shampoo gel in cardboard packaging instead of plastic, showing a commitment to more sustainable options. The interviewee firmly believes that using sustainable products, like refills, has a positive impact on the environment. She emphasized her concern about plastic, which often ends up in the oceans, and acknowledged that it is not always possible to reuse all traditional packaging. Regarding the influence of friends and family, she stated that their opinions make her more aware and informed about environmental issues, which can influence her decisions when buying sustainable products. Finally, when addressing the influence of social media, the interviewee indicated that she does not feel affected enough to make purchases based on the advice of public figures.

Interviewee J, 15 years old, student – In the interview, she stated that she usually buys products on websites like Shampoo Store and knows about the alternative through these websites. One of the advantages she sees in this alternative is that it has less plastic in the packaging. What prevented her from trying it was not knowing how to use the refill. Regarding the factors that most influence her choice, they are discounts on the product and the detailed explanation of how to use the refill. Additionally, this interview revealed a barrier regarding hair care purchases, as she does not always buy the same range or brand. She also highlighted that this communication makes her reflect on community actions and their negative impact on the world, increasing her awareness of the importance of adopting more sustainable practices. When asked if she has felt influenced by sustainability campaigns or messages, the interviewee stated that she has, although she did not provide specific examples during the conversation. The interviewee firmly believes that using sustainable products, like refills, has a positive impact on the environment. She supported this belief by mentioning that it is not always possible to

reuse all traditional packaging, justifying the need for more sustainable alternatives. Regarding the influence of friends and family, the interviewee stated that their opinions make her more aware of the available sustainable products and practices, which can influence her purchasing decisions. Finally, when addressing the influence of social media, the interviewee declared that she does not feel impacted enough to make purchasing decisions based on recommendations from public figures or influencers, indicating that she maintains a critical stance towards these sources.

Appendix 4 - Survey guide

It was conducted in Portuguese, here it is translated

Introduction

Hello, my name is Margarida, and I am a Master's student in Management at CATÓLICA-LISBON. I am currently conducting my thesis on the adoption of refill systems in the hair care sector among the Portuguese population. All responses are anonymous, and the data collected will be used exclusively for my research. The average completion time is 8 minutes.

Thank you for your contribution!

Demographic Data:

Q1: What is your gender?

- a. Male (end the survey)
- b. Female

Q2: What age group do you belong to?

- a. Under 14
- b. 14 - 27
- c. 28 - 43
- d. 44 - 59
- e. 60 - 78
- f. Over 78

Q3: What is your level of education?

- a. No education
- b. High school

- c. Technical or vocational education
- d. Higher education
- e. Postgraduate (Specialization, Master's, Doctorate)

Q4: How often do you buy your hair care products?

- a. Bi-weekly
- b. Monthly
- c. Every 3 months
- d. Every 6 months
- e. Annually

Part 2 – Knowledge and Use of Refill Systems

Refill systems are a sustainable packaging solution that allows consumers to replace or refill used products, using packaging specifically designed for this purpose.

These refills can be used both as standalone packages and to refill traditional product containers, promoting reuse and waste reduction.

Refill systems are especially popular in various industries, including cosmetics, food, cleaning products, and personal care.



Q5: Where do you usually buy hair care products?

- a. Online store
- b. Physical store (end survey)

Q6: Have you ever purchased a refill package for your hair shampoo?

- a. Yes (continue to version 1)
- b. No (skip to version 2)

VERSION 1

Q7: Rate your experience with the refill packaging:

- 1 = poor experience
- 2 = below average experience
- 3 = average experience
- 4 = good experience
- 5 = very good experience

Q8: How do you evaluate the functionality of refill packaging you have used?

Rating scale: 1 = not functional and 5 = very functional

Part 3 - Theory of Planned Behaviour + Communication (H4)

Q9: I see various advantages in using refill shampoos, such as:

(select multiple)

- Sustainability
- Cost-effectiveness
- Convenience
- Quality
- Other - please specify

Q10: For each of the following statements, indicate your opinion according to the agreement scale:

- 1 = strongly disagree
 - 2 = disagree
 - 3 = neither agree nor disagree
 - 4 = agree
 - 5 = strongly agree
- a. I strongly believe that using refill shampoos contributes to reducing packaging waste.
 - b. I am convinced that using refill shampoos has a positive impact on the environment.
 - c. I agree that choosing refill shampoos can lead to long-term financial savings.
 - d. I believe that the people around me (family, friends, colleagues) influence my decision to use refill products.

Q11: How often do you hear discussions about sustainability and the use of refill products in your social circle?

- 1 = never
- 2 = rarely

- 3 = occasionally
- 4 = frequently

Q12: Where did you first learn about refill systems compared to traditional packaging?

- Social media
- Television ads
- On websites
- Other – please specify

Q13: To what extent does communication about the sustainability of refill systems influence your purchasing decision for personal care products, such as shampoos?

Rating scale:

- 1 = little influence
- 2 = slight influence
- 3 = moderate influence
- 4 = significant influence
- 5 = very influence

Part 4 – Factors Influencing the Purchase of Refill Shampoo (H1, H2, and H3)

Q14: When considering buying a refill shampoo, what factors influence your decision?

- Price
- Packaging capacity
- Ease of use
- Brand
- Promotion or discount
- Composition and ingredients
- Environmental sustainability

Q15: How conscious do you consider yourself regarding environmental issues?

Rating scale: 1 = not conscious to 5 = very conscious

Q16: How important are environmental awareness campaigns in your purchasing decision?

(Rating scale: importance)

VERSION 2

Q17: What has prevented you from trying the refill system for shampoo?

For each of the following statements, indicate whether you agree or disagree:

- I do not have enough information about how the refill system works.

- b. I prefer to use traditional packaging over refill systems.
- c. I am concerned about the quality of refill products compared to conventional ones.
- d. The price of refill products does not seem attractive to me.
- e. I cannot find refill products at the places where I usually shop.
- f. The convenience of using conventional products is more appealing to me.
- g. I tend to try different ranges and brands of hair products based on their effectiveness.

Part 3 - Theory of Planned Behaviour + Communication (H4)

Q18: I see various advantages in using refill shampoos, such as:

(select multiple)

- Sustainability
- Cost-effectiveness
- Convenience
- Quality
- Other – please specify

Q19: For each of the following statements, indicate your opinion according to the agreement scale:

- a. I strongly believe that using refill shampoos contributes to reducing packaging waste.
- b. I am convinced that using refill shampoos has a positive impact on the environment.
- c. I agree that choosing refill shampoos can lead to long-term financial savings.
- d. I believe that the people around me (family, friends, colleagues) influence my decision to use refill products.
- e. I would be more inclined to buy refill shampoos if I knew that people I admire (such as influencers) also use them.

Q20: How often do you hear discussions about sustainability and the use of refill products in your social circle?

- 1 = never
- 2 = rarely
- 3 = occasionally
- 4 = frequently
- 5 = very frequently

Q21: Where did you first learn about this alternative solution to plastic packaging?

- Social media
- Television ads

- On websites
- Other – please specify

Q22: To what extent does communication about the sustainability of refill systems influence your purchasing decision for personal care products, such as shampoos?

- 1 = does not influence
- 2 = slight influence
- 3 = moderate influence
- 4 = significant influence
- 5 = very influential

Part 4 – Factors Influencing the Purchase of Refill Shampoo (H1, H2, and H3)

Q23: When considering buying a refill shampoo, what factors do you think would influence your decision?

(organize on a scale of importance 1 = not important and 5 = very important)

- a. Price
- b. Size of the packaging
- c. Ease of use
- d. Brand
- e. Promotion or discount
- f. Composition and ingredients
- g. Environmental sustainability

Q24: How conscious do you consider yourself regarding environmental issues?

- 1 = not conscious
- 2 = slightly conscious
- 3 = moderately conscious
- 4 = conscious
- 5 = very conscious

Q25: How important are environmental awareness campaigns in your purchasing decision?

- 1 = not important
- 2 = slightly important
- 3 = moderately important
- 4 = important
- 5 = very important