



MASTER'S DISSERTATION

“THE DARK SIDE OF SUSTAINABLE SINGLE-USE PLASTIC
ALTERNATIVES”

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The Dark Side of Sustainable Single-use Plastic Alternatives

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ABSTRACT

As a result of the growing single-use plastic problem faced nowadays, new alternatives of various materials are being created to help fight the problem. However, the impact of these alternatives is yet to find out. The success or failure of those alternatives is in the purchasing behaviour of the consumer.

The theme of this investigation is related to “Green Marketing”, more precisely understand the dimension concerning the consumer's perception with single-use plastic alternatives.

This study aims to understand if single-use plastic alternatives are viewed as another trend or a good solution on the lens of the consumer. The investigation is based on a qualitative methodology. A systematic literature review to gather all the essential literature and interviews, which were made to a diversified audience to understand their perceptions regarding the alternatives.

The research findings of the qualitative method approach indicated that the consumer sees the single-use alternatives as a possible good solution but yet far from perfection. However, the concern over the environment is evident, and the elimination of single-use plastics is being seen as almost crucial.

Keywords: Consumer perception, Consumer behaviour, Single-use plastic, Plastic alternatives, Sustainability



RESUMO

Estão a ser desenvolvidas alternativas novas e de diferentes materiais para tentar resolver o crescente problema de plástico descartável, que se enfrenta. No entanto o impacto que essas alternativas podem vir a ter, ainda é desconhecido. Para além que o sucesso ou fracasso dessas mesmas alternativas está dependente do comportamento de compra do consumidor.

O tema da investigação está relacionado com “Marketing Verde”, mais precisamente, entender a dimensão da perceção do consumidor com as alternativas ao plástico descartável.

O estudo tem como objetivo entender se as alternativas ao plástico descartável são vistas como uma tendência ou uma boa solução na perspetiva do consumidor. A investigação é baseada numa metodologia qualitativa, onde foi desenvolvida uma revisão sistemática da literatura para reunir a literatura mais relevante e entrevistas, que foram feitas a uma audiência diversificada, para melhor entender a perceção do consumidor com as alternativas

Os resultados deste método qualitativo demonstram que o consumidor vê as alternativas ao plástico descartável como uma possível boa solução, mas ainda longe da perfeição. No entanto a preocupação ambiental é evidente e a eliminação do plástico descartável visto como algo praticamente essencial.

Palavras – chave: Perceção do consumidor, comportamento do consumidor, plásticos descartáveis, alternativas ao plástico, sustentabilidade.

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1. INTRODUCTION

The world is facing sustainable problems since the former century (Straughan & Roberts, 1999). In a study conducted by Robert Straughan in 1999, it is noticeable that he already investigated alternatives for pollution problems and green consumer behaviour. During the article, the author said at the time that with an increment of social and political pressure, companies were adapting and looking for alternatives in packaging, formulations, and cause-related promotion, instead of only addressing pollution and waste disposal. This way, companies tried to keep up with the environmental movement (Straughan & Roberts, 1999).

Plastic is one of the worst environmental crises of the modern world, and it is believed that by 2050 there would be more plastic than fish in the sea (Ellen MacArthur Foundation, 2017). A problem with this material is that only a small percentage is recyclable, and the ones that are, gradually lose quality and even become improper for some uses, again contributing to the plastic problem (Williams, Davey, & Johnstone, 2020). The plastics that are a massive concern are single-use plastics. The European Commission states that this type of plastics can have a drastic impact and are likely to end up in the seas.

Nowadays, the environmentally sustainable type of consumption represents less than 4% of the world's purchases. Rethinking this problem, researchers are doing studies regarding consumer behaviour, having particular attention to the “green” products and “green” consumer. Explicitly, some authors

say that the more information regarding the consumer's behaviour, the easier the process of developing products and services with attributes that could perhaps increase sales (de Medeiros & Ribeiro, 2017). However, the more environmentally friendly products come with the fear of greenwashing. Since some information's are too vague being referred to and labelled as "bio" or "eco", for example, losing the credibility near the consumer which could contribute to a reduction of consumption, although gradually the tendency is changing and more consumers are paying attention to that (Lewandowska, Witczak, & Kurczewski, 2017).

Therefore, in the current context, it is important to assess the impact the consumer has on environmental sustainability and understand the relation of these "new" emerging alternatives. Hence the purpose of this study is to answer the following research question: **Are single-use plastic alternatives viewed as another trend or a good solution on the lens of the consumer?** For that, will be explored the following objectives:

- 1) Identify and understand the main source of environmental impact related to single-use plastics;
- 2) Understand the dimension of the single-use plastic alternatives and their consequences;
- 3) Understand the perception of the consumer regarding environmental responsibility;
- 4) Comprehend the relation of the consumer with the single-use plastic alternatives;

- 5) Perceive the awareness of the consumer to follow a more environmentally friendly lifestyle.

The core problem of this study dwelled in the need for answers to change behaviours that are much needed to help the environment. Plastic has been a severe problem that not only affects the environment but also has already entered the human food chain through marine wildlife (Heidbreder, Bablok, Drews, & Menzel, 2019). So, the study will be focusing on plastic alternatives, more specific on single-use plastics, for being such a massive problem for the environment. The choice for focusing on single-use plastic alternatives is because there is not yet proof that these alternatives will have better environmental results (Evans, Parsons, Jackson, Greenwood, & Ryan, 2020). Therefore, the study wants to understand the consumer's perception regarding these alternatives and the consequences regarding that.

The research starts with a literature review to analyse and understand the perspective of the academics about the theme under investigation.

The second phase will be presenting the conceptual model, which will be the basis of the investigation after will be presented the methodologies adopted for the data collection.

At the end will be presented the analysis of the findings and, subsequently, the results. Concluding the research, the last chapter will be a balance of the results as well as suggestions for future research.



2. LITERATURE REVIEW

The next chapter is going to present the literature review of the theme under investigation. It will show the framework of the theme and a conceptual approach to understand the principal subjects. The chapter was done considering the importance of single-use plastic pollution and the position the consumer has when speaking about the alternatives.

To present the literature review and consider the topic under investigation, a rigorous process of a systematic literature review was conducted to gather pertinent literature for the study and support the elaboration of the questions for the semi-structured interview later presented. The methodology of the process for the systematic literature review can be found in chapter 4. The intersection of the review between single-use plastic alternatives and consumer behaviour and perception concerning the sustainable alternatives made it possible to elaborate an analysis considering 18 papers that were chosen after a methodical criterion of screening and eligibility.

The following paragraphs will provide a contextualization of the theme. It is separated into 4 main subchapters: Understand what are single-use plastics; The dimension of single-use plastics alternatives and its characteristics; Understand the Consumer: awareness, behaviour, and drive when choosing alternatives; and Marketing messages and Greenwashing: Understand the role of companies with the single-use plastic alternatives.

2.1. UNDERSTAND WHAT ARE SINGLE-USE PLASTICS

Plastics have an essential role in everyday life, for being a material that is adaptable and affordable. On the other hand, it lacks degradability is made of 90% fossil fuel, and only 2% can be recycled back to a similar or identical type of quality, which translates into a dangerous environmental problem. Under such circumstances, “green technologies” or innovations are at the centre of attention (Confente, Scarpi, & Russo, 2020).

In today’s world, it is impossible to imagine not using any type of plastic material. It can be found in a vast number of applications, like clothing, construction, agriculture, electronics, and packaging, this last one being the most used. Consequently, all these functions come with a waste problem. Plastic is produced in large numbers, approximately 300 million tonnes. Because of its immense durability, it accumulates in landfills and even in the natural environment (Herberz, Barlow, & Finkbeiner, 2020), being the oceans a factor of massive concern regarding plastic pollution. In 2015 approximately 10 % of plastic polymers ended at marine and coastline ecosystems (Viera, Jimenez, Castro, Marques, & Nazareth, 2020). Also, earlier studies have found that plastics contribute to 40 to 80% of macro marine debris (bigger than 20 mm diameter), most of these polluters come from food-related products, like bottles and lids, bags, straws, and polystyrene (Chitaka, Russo, & von Blottnitz, 2020). In addition, there are microplastics which are small fragments of plastic (plastics with 5mm to 1mm (Foteinis, 2020)) and are a growing contaminant in the

oceans. These microplastics could be divided into two main groups. Primary which represents the products that in their nature are already made of small particles, like for example glitter and secondary, which are made from the fragmentation of larger types of plastic could be for example through the sun (UV light), water wind in between others, an example is the fibres from synthetic clothes (Yurtsever, 2019). Such problem ends up having a negative impact on human health (a recent study found that humans ingest microplastics with their food (Yurtsever, 2019)), nature, and even in local economies (fisheries, activities related to tourism, and beach clean-ups (Civancik-Uslu, Rita Puig, Fullana-i-Palmer, & Hauschild, 2019)).

There are methods to help reduce these impacts, like life cycle assessment, a methodology to quantify a product's environmental impact considering its entire life (Changwichan & Gheewala, 2020), usually used in the food and beverages industries to support the creation of packages. However, the improper disposal of these products makes them the major contributor to pollution (Chitaka et al., 2020). Considering the dangerous contribution of plastic alongside its advantages for humankind, it is debatable the way it is supposed for humans to look at plastic as a blessing for the help it provides or as a curse for the negative side-effects of its use (Yurtsever, 2019). Also, legislation has been created worldwide to prevent the use of some plastics and avoid plastics' discharge into the oceans. However, the problem with some of these policies regarding consumption is that it can negatively lead to a consumption shift from plastic to another material, and not exactly its reduction or incentive to recycling which will end up only be providing part of the solution (Herberz et

al., 2020). As described at the beginning of the chapter, researchers have drawn attention to the fact that only a tiny part of plastics are indeed recycled. This problem comes with the added concern that if no measures are taken using the long run of disposable products, even rocks will start to be formed of plastic (Yurtsever, 2019). A practical example of failed recycling is disposable paper cups. Paper cups are lined with a thin plastic coating in their interior for becoming waterproof, which makes them considerably the same category as a single-use plastic product. Even though both external and internal materials are recyclable, usually, the cup ends up in landfills. The bond between both materials is so strong that its recyclability turns out to be challenging. Besides, there are still misconceptions regarding how they should be recycled, which leads to improper disposal. The same happens with compostable cups, as would be explained in more detail in the following subchapter; these products usually cannot be composted in a typical house but in an industrial environment (Foteinis, 2020).

These legislations created affect in their majority, single-use plastics. Single-use plastics are, according to the official website of the European Commission, products used only once or for a short period of time and then being thrown away. The ones affected by these policies are items, such as cotton bud sticks, cutlery, sticks for balloons, plates, drink stirrers, and straws (“Single-use plastics,” 2019). Straws, however, had a more considerable visibility effect because of a video of a painful extraction of a straw from a nostril of a marine turtle. Consequently, this created such a global shock that movements around

the globe lead environmental agencies and governments to plan actions banning the straws made of single-use plastic. This proves that it is possible to take major action against a common problem (Viera et al., 2020).

Furthermore, not only policies to reduce or control the use of single-use plastics are being created, but new technologies are also being developed to offer sustainable alternatives for single-use plastics. (Viera et al., 2020). Although, even when changing for single-use plastic alternatives, some characteristics need to be taken into deliberation before making that shift.

These single-use plastic alternatives that are starting to emerge are not all the same and end up having different environmental impacts associated with the different materials (Chitaka et al., 2020), which will be further explained in the next subchapter.

2.2. THE DIMENSION OF SINGLE-USE PLASTICS ALTERNATIVES AND THEIR CHARACTERISTICS

The alternatives for single-use plastics are beyond focusing on the benefits for products more environmentally friendly. It is important to consider the consumer need and if the characteristics will be similar to the ones from plastic (being cheap, light, and versatile) (Harding, Gounden, & Pretorius, 2017).

Technologically speaking, bioplastic is being considered as a possible alternative. A plastic can be defined as bioplastic if it is in part or completely made from renewable raw materials (it can be in part or entirely made from

biomass (Harding et al., 2017)) and if it meets the specifications for biodegradability. These plastics are able to biodegrade in warm and humid conditions like in industrial composting (Confente et al., 2020). Compared to petroleum-based plastics, bioplastics are more biodegradable and more environmentally friendly. They have lower greenhouse gas emissions and fossil fuel usage. Although the greenwashing problem is still presented in this alternative, for the misuse of the term “bio” without the product being environmentally friendly or biodegradable, this technique is used to try to promote products by the companies (Harding et al., 2017) in further subchapters it will be explained in more detail.

Above all, this material can be composed of a variety of plants, like bioethanol made from sugar cane, starch which is from corn or potatoes, cellulose, and plant oil. The main concern over this alternative is the negative impact this product could have on the environment, regarding the cultivation of some specific plant species and the intensity that would require, which makes it lose the ecological advantages it could have. When thinking about new alternatives, the entire life cycle of it needs to be studied to understand the environmental impact and the advantages and disadvantages producing them could have. To clarify bioplastic might not be 100 % biodegradable because of some of its components. It is important to not mistake bioplastic with biodegradable plastics (biodegradable plastics could be made of bioplastics; however, bioplastic does not need to biodegrade completely). The demand in the market for this product is low because the lack of information and the existing

small range of products makes the consumer still not aware of it (Scherer, Emberger-Klein, & Menrad, 2017).

Another alternative is biodegradable plastic, however, is still controversial the amount of biodegradability it has to have, biodegradable materials are described as the ones that can be entirely converted into water, CO₂, methane, and biomass, once they are subjected to bacterial activity, with certain environmental circumstances and in short periods of time (Viera et al., 2020). Several plastics can be developed to be degradable using different types of materials. Biologically degradable plastics made of vegetable materials do not add to full landfills nor litter. Although, it shows some adverse outcomes in terms of energy used in agriculture and transport to produce them (bioplastic). It could be considered unsustainable the number of resources waived to such a short-lived product (Mulder, 1998). Biodegradable polymers are still considered expensive, with low resistance, and not adequate for all types of purposes, which led to the creation of oxo-biodegradable and hydro-biodegradable materials. Oxo-biodegradable usually is a combination of regular plastic with pro-oxidants or pro-degrading agents, this way, it accelerates the process of degradation. Hydro-biodegradable materials are sensitive to hydrolytic biodegradation and usually have cellulose and/or starch in their composition. Although residues created by oxo-biodegradable materials show a faster degradable rate than petroleum-based ones, there is no verified evidence that they can complete degrading under natural environments (Viera et al., 2020).

Consequently, oxo-biodegradable materials cannot be considered biodegradable plastics. Truthfully, some evidence suggests that this material accelerate the development of microplastics. Subsequently, this could bring harmful consequences because some countries do not establish biodegradability criteria, for these plastics alternatives, the European parliament, on the other hand, ascertained that this material should not be labelled biodegradable and put restrictions on its use (Viera et al., 2020).

It is impossible to discuss single-use plastics alternatives without referring to single-use plastic bags, which are considered one of the principal contributors to marine pollution (Civancik-Uslu et al., 2019). Most countries are creating policy bans regarding single-use plastic bags to reduce their usage, for being so pollutant (Civancik-Uslu et al., 2019). Some of the policies involve paying for being handled a carrier bag in the supermarket. To help fight this problem, it was created alternatives made of different materials. Reusable plastic, paper, raffia, and cotton bags are some of the alternatives for conventional single-use plastic bags, it is necessary, however, to have in consideration that regarding being a sustainable alternative for conventional plastic bags, they still pollute. They can indeed have a more significant impact than the conventional ones, depending on how they are being used. An example is reusable low density polyethylene carrier bags. These bags have the lowest environmental impact, regarding production and disposal in contrast with the other alternatives even paper bags. A study conducted in Denmark with these bags has shown that it is recommended to reuse them as much as possible and,

in the end, use them as a waste bin liner. Another study, this time performed in the United States. Ended having the same conclusions, these types of bags have a better environmental performance than the single-use high-density polyethene bag with 30% recycled content (if it is reused 6.2 times) and 100% recycled paper bag (if it is reused 1.7 times). However, it is essential to know that most consumers do not use the low-density polyethene bag enough times for this to happen (Civancik-Uslu et al., 2019). This once again proves that even with alternatives, the consumer influences the environmental impact something can have. The conclusions of these studies will be used during the interview process to understand the consumer's perception regarding the information that plastic could have a smaller impact than paper.

Lastly, and to understand the complexity of single-use plastics, and the ones that generally go unnoticed are menstrual products. Their disposable nature is the number one negative impact this product has on the environment. Not all menstrual products are, however, disposable. One reason pointed for the disposable becoming more popular than reusables is the want for companies to make a profit. The reusable product, like a menstrual cup, has the commodity of last for like 10 years, whether other possibility needs to be repurchased with regularity. A study done suggests the explanation for the menstrual cups not being popular even though they were invented shortly after the disposable pads is because of the high levels of marketing done to disposable products in comparison to the marketing done for the cups, this shows the impact marketing can have on the consumer, and in the accomplishment of a product. Also, the mentalities of the woman at the time are believed to be a factor for not being

such a success. Nowadays, exist different alternatives, one more sustainable than others. Examples are organic tampons, organic disposable pads, reusable pads, menstrual cups, and period pants. However, not all these products are easy to find in the local stores and need to be bought in specific stores or online. The alternatives for menstrual products are seen as a good solution, relatively to the most common products. However, the low awareness of some people concerning the environmental impact they could have and the higher price of the organic substitute are factors that impact the consumption choices of these products (Peberdy, Jones, & Green, 2019).

Nowadays, more alternatives for single-use plastic are being developed since the problems associated with plastic pollution are a global concern. As examined through this subchapter, most of the answers for this problem pass by replacing plastics with another type of material (Evans et al., 2020). Although there are only a few examples of the alternative's existent, stated in the text, it is noticeable that bioplastics and biodegradable plastics are being a significant part of the technological development of alternatives. During the research, from the 18 papers collected through the systematic literature review, only 3 do not refer to any type of biodegradable plastic or bioplastic because they describe sustainability in general. As indicated, these alternatives can be divided into different forms of materials depending on the resources used in the composition, which influences the impact it could have on the environment, as well as the use the consumer gives to it, has as being mentioned throughout the chapter (Evans et al., 2020). A stainless-steel cup, for example, as an alternative for a common

single-use plastic cup, can have different measures of impact on the environment, in a study done, the impact of using the cup for three years is smaller than if it is used for only one. In the study, they had in consideration if it was hand-washed or if it was used a dishwasher, weighting the water used and energy, (Changwichan & Gheewala, 2020) so, the consumer behaviour, as well as the life cycle of the product, has something that needs to have into account.

The thing is, it is important to have deeper evidence of the environmental impacts of plastic and, of course, their alternatives, but the problem is not only the plastic per se but how people are using and discarding it. The consumer still is discharged of any blame of environmental responsibility. However, it is important to notice that even though some alternatives could look favourable in replacing plastics, it is not yet clear the consequences they could bring to the environment (Evans et al., 2020). Also, it is essential to give consumers importance when the theme is alternatives. Additionally, some sustainable practices are not well received by the consumers, which will influence the sales of a product, as seen in the example of menstrual cups (Confente et al., 2020).

2.3. UNDERSTAND THE CONSUMER: AWARENESS, BEHAVIOUR AND DRIVE WHEN CHOOSING ALTERNATIVES

The consumer is an essential part of the success the alternatives can obtain. It is essential to understand what the consumer thinks about certain products and if they are going to purchase them (Confente et al., 2020).

Value has been identified as a driver of consumer behaviour; it is used as a standard to define their preference and the evaluations they make about something (Confente et al., 2020). It is believed that when consumers present high environmental attitudes and values, they will adopt environmentally friendly choices (Thongplew & Kotlakome, 2019). Value and values are two distinct concepts that work for the same results. Values can represent the previous preferences or decisions made by the consumer and help to specify what is considered the value for that individual. One of the values identified by previous studies is self-identity. Self-identity can be explained as the way the person sees itself and how it takes decisions to adhere to the values and conducts of a certain group of people that the person wants to feel that it belongs. Among other values existent, self-identity was identified as an important potential value in the environmental sphere. Due to the increase of importance given to being more “green” or sustainable responsible, the perceived value from these more sustainable products can be influenced by the consumer value system, which means, how the consumer sees itself as a more sustainable person, will influence the value that consumer will notice about the sustainable or “green” products. Some previous studies have named this, green self-identity. These perceived

values can affect the decision to purchase sustainable products (Confente et al., 2020). For example, when the consumer is seen using a reusable bag instead of one of plastic, it works as a way of social comparison. The consumer is being recognized by others and is recognizing others with the same habits. It creates an emotional connection among people with the same preferences. In this case, it is for using a more sustainable approach for carrying groceries. (Cherrier, 2006)

Additionally, there are politically constructed social norms, which are essentially moulding the behaviour of an individual by using social approval/disapproval as a motivation. The consumer will feel that has to follow a certain morally responsible behaviour as an obligation towards others. The interaction between these two opposite theories, social norms, and self-identity grows over time and context, and it works together for the same objective of ethical consumerism (Cherrier, 2006).

Consumers are in a continuous change of behaviours, attitudes, and tactics when the theme is consumption. Currently, consumers are more informed and pay more attention to the influence their consumption behaviour can have on the environment. Usually, consumers have different perceptions of what their consumption behaviour can have an impact on. Although, even though people are more aware of ecological problems, there is still the difficulty of perception between their micro consumption patterns could influence macro problems, like for example environmental degradation. Even though they could

show concern over the degradation problem, it would not necessarily reflect in their buying habits (Orzan, Cruceru, Chivu, & Balaceanu, 2018).

Sustainable consumer behaviour can be described using different models, as explained by (Orzan et al., 2018). The first model used by this writer is the theory of planned behaviour. This model has in consideration the cognitive and normative aspects behind consumer behaviour, and it is usually used as a prediction and explaining certain behaviours, like recycling, sustainable consumption, or self-sustainable development. The other model explained by the author is values-beliefs-norms. It has the same variables as the first model and essential factors that could influence their attitude, which plays a huge role in consumer behaviour. Although moral norms as well as other variables, can be important for explaining the sustainable behaviour of the consumer, it only does it until a specific limit. Finances are a heavy decision-maker, if the product is expensive, the consumer morality will not be such a crucial influence on the purchasing behaviour as it would be if the price were lower. (Orzan et al., 2018)

This means that even though consumers demonstrate a genuine interest in the environment, it would not going to reflect directly in green purchases. Some studies have found that the positive attitude regarding sustainable alternatives does not reflect directly into acting. Some scientists call it the attitude-behaviour gap. Some of the explanations for this among others, are price, availability of eco-packaging, and social influence (Orzan et al., 2018). It is considered that consumers will be more environmentally friendly driven when appropriate technologies, proper infrastructure, and sustainable products are

made available, which are the influence of economic and social elements enabling sustainable consumption (Thongplew & Kotlakome, 2019). However, it is still a dialectical relationship between consumption and intention, and some academic defend that social influence is an important factor when others, defend that is not (Orzan et al., 2018).

Moreover, informed consumers are perceived to be keener to make environmentally friendly choices. When interested in purchasing products, consumers usually go through a process of considering certain characteristics, influenced by the consumer knowledge, familiarity, and attitudes. These characteristics can vary in price, appearance, the functionality of the product, the brand, leisure, the materials used to produce them, environmental impact, or food safety. When the theme is food, however, the alternative choice looks more promising. The consumer is more willing to pay for local food because of the perception that buying locally the food will have superior taste and will support the local economy. The willingness to pay for a product will be shaped by pre-knowledge information and attributes, or new information that could be introduced by the label, the website, or other sources (Grebitus, Roscoe, Van Loo, & Kula, 2020). Although more environmentally friendly products are not exactly pricey, the “traditional” products are particularly cheap, which influences the consumer’s purchasing choice. Still, if this cost could add value, as bringing environmental benefits, the consumer will opt for the cheaper one, even if it shows environmental concern (Orzan et al., 2018).

Nevertheless, it is important to pass a message to the consumer, to be able to change behaviours, like with found new information the consumer could avoid the purchasing of certain products and opt for an alternative instead. However, this, too, could have a harmful outcome because alternatives are seen as a solution to mitigate the problem when that is not the case (Greibitus et al., 2020). It is important to consider the effect of sustainable messages on the consumer, the different ways it could influence, and how they are perceived by the customer (Cummins, Reilly, Carlson, Grove, & Dorsch, 2014). Consequently, some misleading messages could take the consumer to suffer from greenwashing (Viera et al., 2020).

Due to the growing concern with the environment between consumers, the interest in the literature regarding “green marketing” (the aiming to promote and sell products that are environmentally conscious (Gelderman, Schijns, Lambrechts, & Vijgen, 2021)) has increased substantially. Moreover, even though sustainability has gained acknowledgement in the business community, there are still incoherence’s because companies are seeing sustainability initiatives as short-term and not long-term planning (Cummins et al., 2014). This, allied with the greenwashing technics can become a problem for the consumer.

2.4. MARKETING MESSAGES AND GREENWASHING: UNDERSTAND THE ROLE OF COMPANIES WITH THE SINGLE-USE PLASTIC ALTERNATIVES

Although the study aims to focus on the relation between the alternatives and the consumer, it is crucial to speak about the messages the businesses are passing for the customer and how they are being interpreted. More precisely, even though it is not possible yet to know how much greenwashing can contribute to the plastic pollution problem, having inadequate practices derived from purposeful misinformation on a large scale can have a relevant portion of this environmental issue (Viera et al., 2020). Also, during the literature review, it was demonstrated the importance the consumer has on the success of an alternative for single-use plastic. Greenwashing means some company deceives the consumers into making them believe a product or service can potentially be more environmentally friendly than it is or the environmental conduct a company may have. This tactic is used to attract customers interested in living a more sustainable kind of life by wrongly influencing their purchasing decisions (Viera et al., 2020).

Consumers have difficulty understand the importance of the part they play in the environment. That is why the need for business and marketing together to send on that message. However, when associated with business strategy, marketing usually fails to combine environmental concerns with social impacts. The importance of the success of these messages is that they can provide a natural connection between product use, to the environmental outcome it could have. Here is where it is necessary for environmental

advertising. This is meant to help people understand the impact on the environment they could have as individuals (Cummins et al., 2014).

Several companies have developed some type of “green marketing” to promote their image as pro-environmental. However, consumers are still septic regarding this type of advertising. Usually, this happens because of the lack of depth or meaning in the environmental messages. Moreover, the consumer should trust more “green” advertising. Although, companies must move beyond pure profit motives (Cummins et al., 2014). Whereas some companies are changing the way of doing business to meet the needs of the new consumers with environmental concerns, others just want to take advantage of this new market for their own success (Orzan et al., 2018). The main problem is that some companies take advantage of the consumers who are willing to pay extra for a product to be environmentally friendly, it is a common practice (at least in bigger economies like in the American continent) to purposefully label a product incorrectly, like for example claiming a product is made from biodegradable plastic even though it does not show evidence of degradations in the time being. This comes to prove that the plastic industry is showing some resistance in effectively combating the plastic problem (Viera et al., 2020).

Consequently, around the world had happened several cases of greenwashing regarding biodegradable single-use plastics over the years, which led consumers to dispose of false biodegradable single-use plastic into the environment. Nowadays, there are technical standards that establish the biodegradability and composability criteria of the products, to avoid any

intention or not of the incorrect use of the product. However, there is proof that some companies do not follow several regulations, and new ones are created to be more profitable (Viera et al., 2020). It is not easy to change the status quo of the industries and be able to stop using plastic altogether, but as complex as it is, there is the possibility to change the role of plastic in modern society, configure things differently, instead of making the same products but with different materials (Evans et al., 2020, Yurtsever, 2019).

2.5. FINAL REMARKS

The growing interest in sustainability and the consequences of years of using single-use plastics is making consumers seek alternatives and paying attention to different aspects that perhaps usually would not do.

On the other hand, companies play a huge role in creating alternative materials and changing their business model to one that will consider the necessities of the consumer and the environment. However, there is always the shadow of greenwashing lurking around.

Thus, the proliferation of these new alternatives can bring fresh concerns or new ways of pollution that are not mainstream enough to be considered concerning. This way, the study proposes to understand if single-use plastic alternatives are viewed as another trend or a good solution on the lens of the consumer. The investigation is proposing to fill some gaps in the literature about single-use plastic alternatives. Usually, the literature divides the two aspects, the



technical involvement to understand the impact of the different materials and the involvement of the consumer and industries in the process. These gaps will be filled during the following methodology.

3. CONCEPTUAL MODEL

During the literature review was conducted the critical analysis of the articles selected during the systematic literature review. In the 4 subchapters was made a summary of the knowledge that will draw the dissertation.

To do so, this chapter will be organized a conceptual framework. According to (Kivunja, 2018), a conceptual framework is the researcher understanding and identifying the research topic, the questions that need to be asked, the theories, the methodology, in between others, in short, the reflection of the entire operation of the research process.

The main objective of the investigation is to understand if single-use plastic alternatives are viewed as another trend or a good solution on the lens of the consumer.

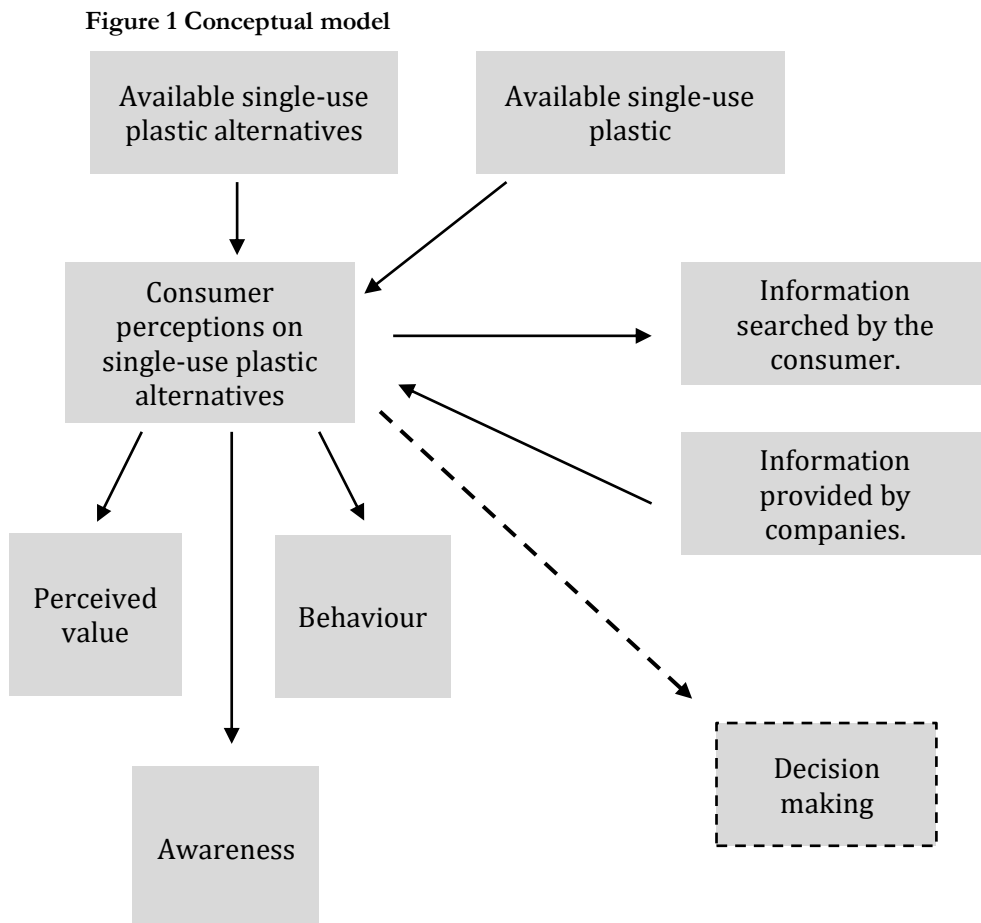
Has a way to best understand and answer this main objective, it will be necessary to proceed to an analysis of the following objectives:

- 1) Identify and understand the main source of environmental impact related to single-use plastics;
- 2) Understand the dimension of the single-use plastic alternatives and their consequences;
- 3) Understand the perception of the consumer regarding environmental responsibility;
- 4) Comprehend the relation of the consumer with the single-use plastic alternatives;

- 5) Perceive the awareness of the consumer to follow a more environmentally friendly lifestyle.

Through the investigation, it is essential to answer these main objectives. To do it, the questions during the interviews were created to answer the different objectives in separate stages.

Subsequently, was elaborated a framework to best illustrate the conceptual model (the labels are summarised for convenience) inspired by the theoretical model of (Thongplew & Kotlakome, 2019) and (Confente et al., 2020) to illustrate the investigation.



Source: Self-elaboration based on (Thongplew & Kotlakome, 2019) and (Confente et al., 2020).

By observing the model, it is possible to understand that the consumer perception is at the centre of the investigation. Some aspects contribute to the consumer's perception, like perceived value, awareness, and behaviour. As seen in the literature review, the availability of products will help shape the perception of the consumer. The arrow from the consumer to the information is the one the consumer search by itself. Every influence, from the external factors or internal ones, will influence the decision making of opting for an alternative. So, this comes to the full explanation of the different dimensions:

- **The influence of available single-use plastic alternatives on consumer perception:** The creators of alternatives think about the consumer need. The alternatives need to have specific characteristics (Harding et al., 2017). Also, appropriate technologies, availability, and the appropriate infrastructures will be influences (Thongplew & Kotlakome, 2019). To conclude, the importance of the price of these new sustainable products (Orzan et al., 2018).
- **The influence of available single-use plastic on consumer perceptions:** Plastic can be found in a vast number of applications and is a durable material (Herberz et al., 2020). Additionally, it is adaptable and affordable (Confente et al., 2020). These characteristics help plastic being so popular and available to everyone.
- **The influence of consumer perceptions on the information searched by the consumer:** The perception of the consumer is shaped by the pre-knowledge or new information that could be introduced by different

sources (Grebitus et al., 2020). As well as some misconceptions regarding of possible ways of disposal of the products by the consumers (Foteinis, 2020).

- **The influence of information provided by companies on consumer perception:** Information provided by companies can be coaxed by the want to make a bigger profit, using terms like “bio” to try to promote the products (Harding et al., 2017, Viera et al., 2020) Some information can be found on the label of products as well (Grebitus et al., 2020).
- **The influence of consumer perceptions on perceived value:** How the consumer sees itself, the self-identity value, will influence how much value is perceived by the consumer that a particular product has when purchasing sustainable products (Confente et al., 2020).
- **The influence of consumer perceptions on behaviour:** The perception the consumer has on the consumption behaviour, how much their consumption is going to have an impact on the environment (Orzan et al., 2018)
- **The influence of consumer perceptions on awareness:** The awareness is inevitably related to behaviour; it represents the perception of awareness regarding the environmental impact they have on their attitudes (Peberdy et al., 2019).
- **The influence of consumer perceptions on decision making:** This last dimension represents a final consequence of all the dimensions. The decision making is the behaviour gap exemplified in the literature, as

even though the consumer could show concern and being informed will not reflect on the buying habits. Even though the consumer wants to change behaviours and decide on a single-use plastic alternative, the financial aspect is a heavy decision-maker (Orzan et al., 2018).

To summarize and understand the explanation conjunct with the research objectives it was created a table (table1).

Table 1 Organization table

Research Objective	Dimension being studied	Key-Authors
Objective 1	Available single-use plastic	(Herberz et al., 2020), (Confente et al., 2020)
	Awareness	(Peberdy et al., 2019)
Objective 2	Available single-use plastic alternatives	(Harding et al., 2017), (Thongplew & Kotlakome, 2019) (Orzan et al., 2018)
	Information searched by the consumer	(Greibitus et al., 2020), (Foteinis, 2020)
	Information provided by companies	(Harding et al., 2017), (Viera et al., 2020), (Greibitus et al., 2020)
Objective 3	Awareness	(Peberdy et al., 2019)
	Information searched by the consumer	(Greibitus et al., 2020), (Foteinis, 2020)
Objective 4	Behaviour	(Orzan et al., 2018)
	Perceived value	(Confente et al., 2020)
Objective 5	Decision Making	(Orzan et al., 2018)
	Awareness	(Peberdy et al., 2019)

Source: Self-elaboration

4. METHODOLOGY

To answer the research question, it was chosen a qualitative method for the accomplishment of the thesis. This methodology uses small samples, focusing on the subject experience and characteristics of the participants (Crowther & Lauesen, 2017). For a research question that is rather exploratory qualitative method seem a more suitable choice. As some of the papers used to concretise the thesis opt for a quantitative methodology, a significant sample of results can be found, so using a qualitative method can provide a different focus. Also, as it is a study regarding consumer behaviour, a qualitative method is more explorative and observant of the participants.

Having this in consideration, firstly it was elaborated a secondary data analysis by doing a rigorous systematic literature review to collect and analyse the literature, and a primary data collection by conducting semi-structured interviews to gather and analyse the problem under investigation.

4.1. METHODOLOGICAL APPROACH TO BUILD THE LITERATURE REVIEW

4.1.1. Systematic procedures for collecting theoretical data

The systematic literature review was the first method chosen for data collection. The construction was based on manual filtering, which allows the

reviewer to identify and judge the quality and relevancy of the studies (Centobelli, Cerchione, Chiaroni, Vecchio, & Urbinati, 2020). Such a broad theme emerged the necessity to discover the most relevant papers for the study. In this specific case, understand the consumer's perception with single-use plastic alternatives and the dimension of importance given to it. The complete procedures necessary to do the systematic literature review are explained in detail in the next sub-chapters.

4.1.2. Eligibility criteria

This systematic literature review was conducted according to the guidelines defined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. (Moher, Liberati, Tetzlaff, Altman, & Group, 2009)

This method was used to analyse the view of the consumer perception in the new solutions for the single-use plastic waste problem. This approach was chosen after a first research regarding the plastic pollution problem and consumer behaviour-gap regarding that. Most of the findings end up having the same answers and encounter the same problems during the quantitative or qualitative research. Regarding plastic alternatives, the research was too broad, and not conclusive, not existing enough information. Also, the literature presented some gaps when relating the consumer with alternatives. Under such circumstances, it was decided that a creation of a systematic literature review

would be the best option to culminate the gaps in the literature and help develop new research agenda on the topic. The first step was doing an evaluation of which search terms would be included. This consisted of an evaluation of every keyword existent in a pre-research done about the theme. After some relevant keywords were added or modified to fully capture the nature of the scientific literature, this way it was possible to identify both topics included in this study.

4.1.3.Sources and paper selection

The first step done in this systematic literature review was to recognize the pertinent and eligible papers of the topic. The database chosen was Scopus. Previous studies have shown that the coverage of this database includes most of the academic journals and only a small percentage is not covered by Scopus (Centobelli et al., 2020), the retrieve of this materials was done during March 2021. A total of 18 keywords were applied, using different combinations (Table 2). With this method, a bigger range of papers was selected to be analysed and to find relevant studies. Also, the research words were chosen to balance specificity and sensitivity like “Global plastic pollution” to more specific criteria like “Single-use plastics and consumer behaviour”. This was possible because some of the search terms end up gathering new search results during the inspection of some of the articles retrieved. The search terms had in consideration the inclusive and exclusive criteria, which would be explained below. Overall, 395 articles were initially extracted from Scopus. The selection

of keywords was retrieved from a primary search about the theme under study. The keywords selected by the authors of those papers were used or adapted to better fit the topic. While searching it was used wildcards like "\$" to include for example plastic and plastics during the research, this way, it covered a more extensive range of words. Also, it was used "AND" and "NOT" to include two searches simultaneous like marketing and plastic, and to avoid the medical type of topics, respectively. Only peer-reviewed articles were included that are from academic journals, and it restricted exclusively to English.

The 395 papers were subjected to different phases to have the final sample to examine. To begin, the first exclusion criteria started by eliminating any duplicates, this allowed to reduce to 352 papers. To let research papers closer to the topic under investigation, the titles were scanned and, in case of doubt, the abstracts, following (Centobelli et al., 2020) method. This resulted in an elimination of 186 papers, having a total result of 166. Every article found that had as theme plastic surgery, plastics used in medical care, foam, vinyl, or any material used in construction were excluded, having a total of 162 articles. Then 3 articles were excluded for being about covid-19, even though it was related to plastic pollution and alternatives, is a medical and a pandemic problem. Therefore it did not make sense to include alternatives to plastic in terms of a global pandemic problem, and it should be a choice made by virologists. After all that 1 article was eliminated for being in German, even though it was used an initial filter to only select English papers. At the end of this stage, 166 papers went to a more descriptive analysis phase.

Table 2 Search Keywords in the database

Keyword	Total citations ^a
“Global Plastic\$ pollution”	57
“Global Plastic\$ pollution AND marketing”	0
“Marketing AND Plastic\$ NOT Medicine”	155
“Green marketing AND plastic\$”	5
“Plastic\$ alternative\$ AND marketing”	2
“Sustainable marketing AND Plastic\$”	11
“Sustainable alternative\$ AND marketing strategy\$”	6
“Environmental psychology AND plastic\$ pollution”	11
“Environmental sustainability in marketing AND consumer behaviour”	31
“Sustainable consumption AND Plastic\$”	22
“Ethical consumption AND Plastic\$”	1
“Consumer behaviour marketing AND plastic\$”	6
“Consumer perception AND plastic\$ AND marketing”	0
“Single-use Plastic\$”	84
“Single- use plastic\$ alternative\$”	2
“Single-use plastic\$ alternative\$ AND consumer behaviour”	0
“Single-use Plastic\$ AND marketing”	1
“Single-use plastic\$ AND consumer behaviour”	1

Source: Self-elaboration based on (Centobelli et al., 2020) ^a Data collected in March 2021.

At this point, 7 articles were eliminated for missing data, after an extensive research, these papers were not possible to be found in any database. Consequently, they had to be deleted from the research for not having the

corresponding content. So, 159 papers were analysed in detail, considering the criteria of exclusion that was developed to find the articles that most fit the theme under investigation. The excluding criteria consist of the following considerations.

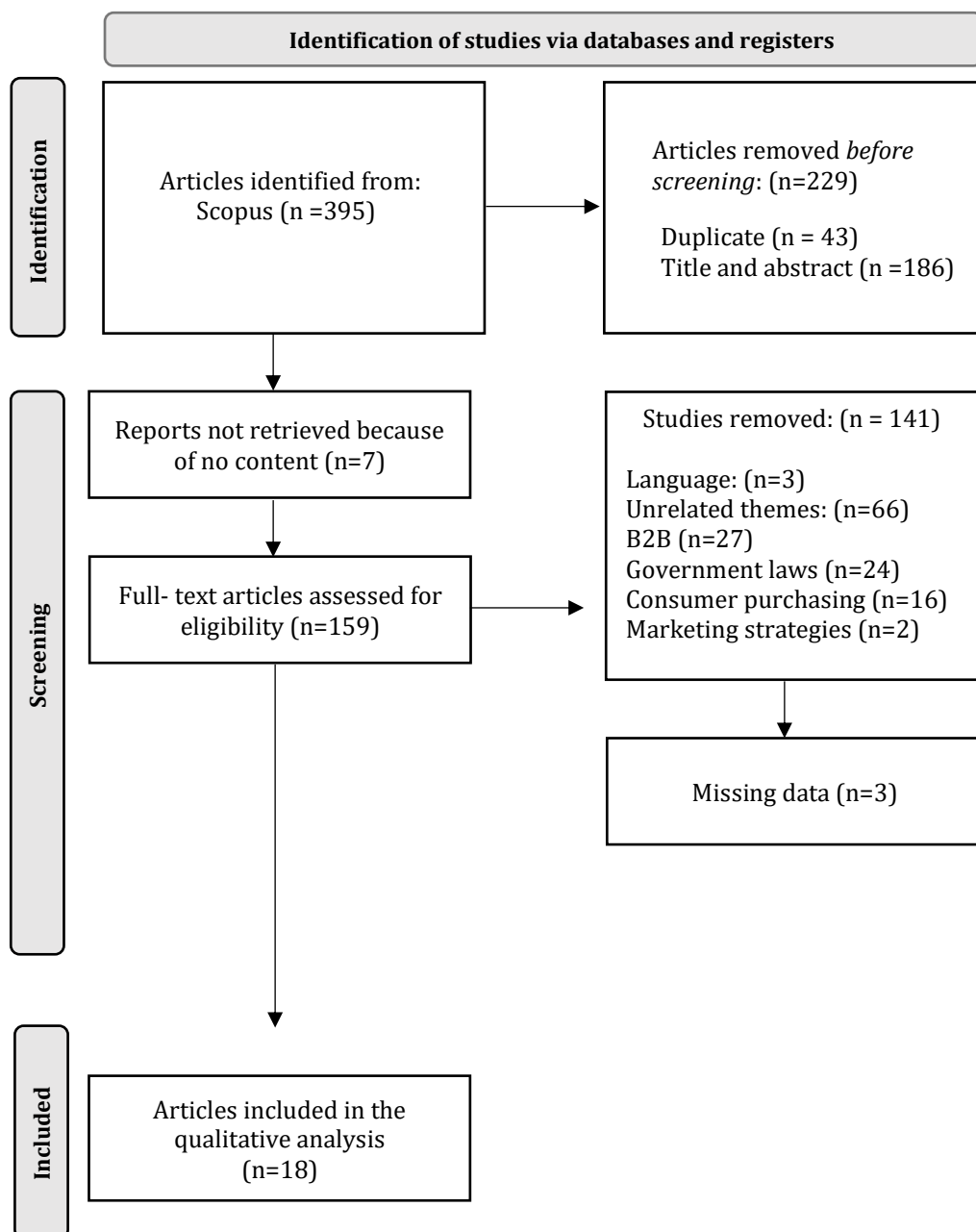
At the beginning of retrieving the articles, 3 were eliminated for being in a foreign language (Germany, Portuguese and Chinese) the title and/or abstract were in English, but the remaining of the document was in the language stated. Additionally, the papers that are irrelevant to the subject like medicine or food engineer, which at the first exclusion passed because the abstract or title was not enlightening, were excluded (6 papers). Marine pollution is among other problems, a consequence of plastic contamination (Simeonova & Chuturkova, 2020). However, this investigation tackles the plastic alternatives and the problems or solutions they can bring and not the plastic pollution per se, so any paper related to marine pollution were eliminated (46 papers). Articles that discuss co2, agriculture or land pollution were also excluded for not being related to the theme (6 papers). Any paper that only discusses measures for reducing the use of plastic, like government laws to implement bans to manage and control plastic pollution or the use of single-use plastics, was excluded because it is not directly related to the theme in question. Reduction does not imply alternatives or does bans. Also, it takes the power of choice from the consumer (24 papers). As the investigation is regarding the consumer behaviour and perspective, articles that were oriented for companies or industries were excluded (27 papers). Additionally, articles where the theme were recycling and

waste management, or clothes and sport equipment made from recycled plastics were eliminated, for not making part of alternatives for every-day single-use plastics, but as a way of minimizing their impact by giving it a new life, or properly dispose of them (8 papers). Marketing strategies that are not at all related to the consumption of alternatives plastics, which were multidisciplinary strategies, were deleted (2 papers). Lastly, concerning consumer behaviour, some papers were eliminated for being too broad regarding the subject, exploring ecological behaviours and responsibility, or emotional responses to images from consumers as an example. Although this topic could be somehow related with the theme in question, it was only selected papers that involve consumer behaviour with alternatives and not reacting to waste or buying more or less plastic products (16 papers).

The inclusion criteria, besides the ones explained above (peer-reviewed, in English and academic journals), were chosen to filter the papers so they could be as specific about the problem under investigation as possible. If a study wrote about single-use plastic alternatives and showed the consumer side and/or perspectives of marketing, they were included for the final stage. Secondly, if it mentions the positive or negative impact of a plastic product (it could show, alternatives to help minimize that said impact), not in a chemical point of view, this means it does not only show the chemistry behind the problem, but it shows it with a marketing or consumer angle, are selected as well. The papers to be carefully chosen had to be relevant direct or in an indirect way with marketing. As a final point, the articles needed to indicate the consumer side or perception (over 18 years old, to have purchasing power).

To conclude, 18 papers were selected as being eligible for the resolution of the work for their relevance to the theme in question. The entire process can be review in the flow chart (figure 2).

Figure 2 Flow chart with the study selection process



Source: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: 10.1136/bmj.n71

4.1.4. Missing data

During the retrieving of the 166 papers selected, 3 articles had to be kindly asked for the authors to make them available for their use. The email was sent on March the third with a limit of 3 weeks of waiting for the document. With no answer, the papers were eliminated.

4.1.5. Descriptive analysis

This subsection of the methodology provides a descriptive overview of the papers selected for eligibility (18 papers). They were analysed considering the following terms:

- Papers and citations thought years and journals.
- Papers by subject area

4.1.6. Paper and citations throughout years and journals

Being such a vast area, which includes marketing, sustainability and consumer behaviour, the distribution of papers over the journals of the 18 papers indicates that there is a connection of the research topics that involve different nature of journals (Table 3). The research was not restricted in terms of years, so, in the beginning of the investigation it was possible to note a big

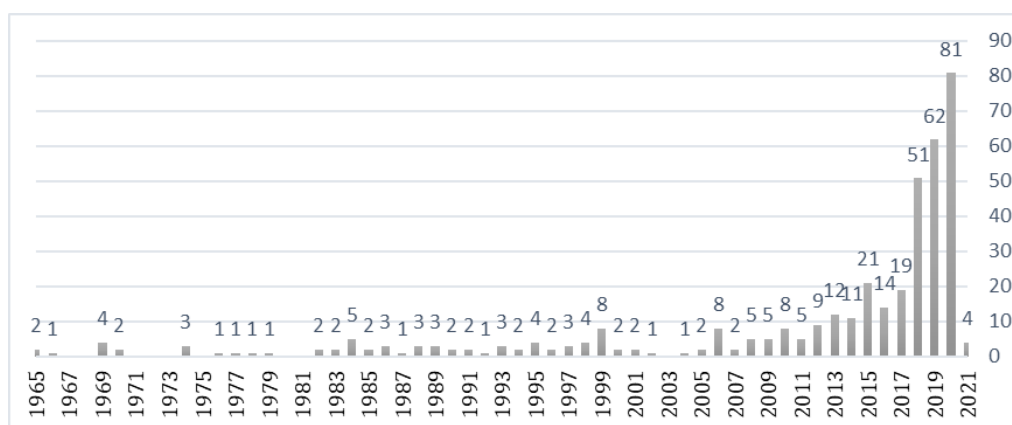
range of different years. Although by restricting the papers, it was noticeable that most of the papers regarding the theme are presented in recent years (graphic 1 and 2).

Table 3 Distribution of papers throughout journals

Journal	Total of papers	Total of Citations^a
International Journal of Consumer Studies	1	40
Sustainable Production and Consumption	2	26
Journal of Business Research	1	18
Journal of Cleaner Production	3	11
Journal of Agricultural and Environmental Ethics	1	12
Journal of Macromarketing	1	25
Sustainability (Switzerland)	3	27
Procedia Manufacturing	1	14
International Journal of Life Cycle Assessment	1	3
Global Environmental Change	1	0
Technological Forecasting and Social Change	1	24
Science of the Total Environment	1	20
Environmental Science and Policy	1	5

Source: Self-elaboration based on (Centobelli et al., 2020)^a Data collected in May 2021.

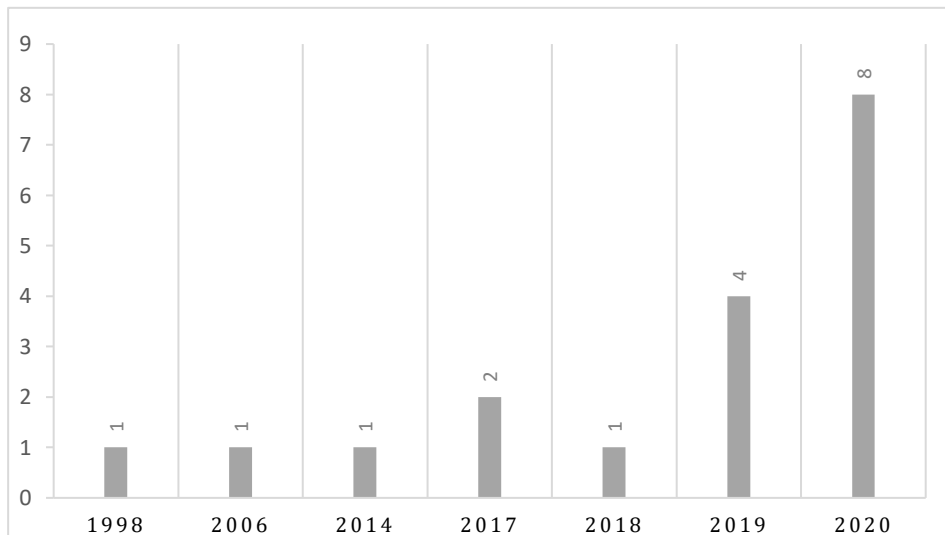
Graphic 1 Papers in years (1st research)



Source: Self-elaboration based on (Centobelli et al., 2020)

In this graphic, it can be observed the different number of years when the first research was elaborated.

Graphic 2 Papers in years (After the criteria were applied)



Source: Self-elaboration based on (Centobelli et al., 2020)

Compared with the second graphic after the exclusion and inclusion criteria, the more relevant papers are focused on recent years.

4.1.7. Papers by subject areas

Regarding the distribution of the papers by subject area of the journal, they were grouped into 10 areas. Although, the attribution of each paper to the subject area does not imply that one paper could not be assigned into more than one area.

This analysis allowed to observe that the vast majority of papers belong

to environmental and sustainable related areas. The areas detected were: Environmental and Sustainability (6 papers); social science (2 papers); business activity (1 paper); interdisciplinary (2 papers); engineering (1 paper); human and policy dimensions of global environmental change (2 papers); life cycle assessment (1 paper); environmental ethics (1 paper); multidisciplinary (1 paper); and lastly social and environmental (1 paper). This categorization helped to show that the topic in study crosses different research areas not only focusing on sustainability (even though it is a great part of it) but also involves other journals.

4.2. METHODOLOGICAL APPROACH TO DATA: QUALITATIVE RESEARCH DESIGN

A research design is a structure to help guide through the research process, to allow the accomplishment of achieving the research objectives.

The research design more fitting to the investigation is a multiple paper design, where multiple papers were studied to identify a theory, in this case, to understand the relation between the consumer and the single-use plastic alternatives and to understand the consumer perception regarding those alternatives (Sondhi, 2011).

The study requires cross-study information, between technical knowledge (understand the alternative materials and how they work) and consumer perception, with the results from the interviews, this approach seems to be the more adequate.

4.2.1. Methods of justification

In a qualitative research, it could be used different methods, such as interviews, focus groups or ethnographic studies. For this particular study, interviews were chosen as the best fitting method because it allows to ask open questions to a small sample and explore the experiences and opinions of the contributors (Seale, 1997).

It would be conducted semi-structured interviews. This way, the interview can follow a different path if needed or be expanded if the researcher found it relevant. This method was chosen because it is a tool suited to gain detailed information, not particularly from a large number of participants. However, it provides an insight into the experience and emotions shown by the interviewees. Although there are papers addressing the theme, the vast majority used quantitative instead of qualitative methods. Consequently, the choice of a qualitative approach will help understand the relationship of the consumer behaviour and practice of what it is believed (Shaw, McMaster, & Newholm, 2016). As the aim of the study is the consumer, it felt natural and relevant to pick this method.

4.3. DATA COLLECTION: SEMI-STRUCTURED INTERVIEWS

Semi-structured interviews help to have some flexibility compared to structured interviews and is more direct than unstructured interviews. This

method allows the participant to talk about the topic freely but always with key questions to help define the area under investigation (Gill, Stewart, Treasure, & Chadwick, 2008). To ensure the trustworthiness of the work it was applied qualitative content analysis to the transcripts of the interviews (Elo, Kääriäinen, Kanste, & Pölkki, 2014). Also, to assist in the realization of the interviews, a small questionnaire was created to gather background information of the participants and simplify the process of interviewing.

The realization of interviews made it possible to understand the consumer on a deeper level, being able to get insights into the interviewee's experience (Shaw et al., 2016).

4.3.1. Interview guide

Before conducting the interviews, a meticulous process of a systematic literature review was made to gather the greatest number of existing literature that would be relevant. This allowed gaining insights to create several questions related to the theme, as well as answering the research objectives, the correspondence can be found in table 4. The questions were thought for not having a bias in their answers and not influence in any way the interviewed. The interview guide can be found in the appendix. The interview will start with simple, broader questions to understand the dimension of knowledge about the theme, as well as a sort of contextualization.

Due to the semi-structured characteristic of the study, the interviewees

had the possibility to answer without constraints about everything they wanted. This made possible the addition of new questions. The clarifications of questions were possible, to make sure the participants fully understood, and the interviewer gets the answer right.

After developing the interview guide, it had to pass for approval, by the thesis advisor to make sure the questions are appropriate or need to be reformulated or suffer changes for improvement. The strategy pass by not elaborating a very extensive discussion, to maintain the attention of the participant, and to not seem too confusing or broad. Due to the cultural background of the interviewees, the questions had to be made in the mother language of the participants and later translated to English. This allowed the interview to flow more fluently and without misconceptions. Also, it must follow a methodological coherence to ensure that between the research question and the method have congruence (Morse, Olson, & Spiers, 2002).

It is important to highlight that the interviews were conducted before the implement of the directive on single-use plastics by the European Union that took effect on 3rd July 2021.

Additionally, a questionnaire was elaborated to gather background information of the participants, for example, name, age, education, and email for being contacted for the interview. Providing this information, it was possible to have a quick overview of the person profile and avoid asking these questions during the interview and go directly for the more relevant questions. The questionnaire and results can be found in the appendix.

Table 4 Correspondence table

Research Goal	Interview Guide	Supporting Authors
General questions		
Objective 3	What do you think is someone sustainable concern?	(Confente et al., 2020)
	Do you see yourself as a sustainable concerned person? If yes, why? /If not, why?	(Thongplew & Kotlakome, 2019)
	In your perspective, who should be taken responsible for being more environmentally friendly?	(Evans et al., 2020)
Objective 1	Do you regularly use any type of single-use plastic?	(Yurtsever, 2019); (Chitaka et al., 2020)
	Do you know the impact those plastics can have on the environment?	(Chitaka et al., 2020)
	Do you believe that single-use plastic pollution can have a negative outcome on your health? If yes, why? / If not, why?	(Yurtsever, 2019); (Civancik-Uslu et al., 2019)
Understanding the dimension alternatives have in the life of the consumer		
Objective 3	When purchasing a product, do you have into consideration the impact is going to have on the environment?	(Thongplew & Kotlakome, 2019); (Orzan et al., 2018)
Objective 2	If you had to choose between a single-use plastic product (for example, plastic bag) or an alternative which, would you choose and why?	(Harding et al., 2017); (Confente et al., 2020)

	Do you usually pay attention to that type of choices? (Being supposedly a more environmentally friendly product)	(Confente et al., 2020)
Objective 4	In general, when hearing about alternatives do you see it as a good solution? Can you tell why? / Why not?	(Evans et al., 2020)
	What are your main concerns about alternatives?	(Confente et al., 2020)
Objective 2	When choosing alternatives do you believe some can have less impact than others?	(Changwichan & Gheewala, 2020); (Evans et al., 2020)
Objective 5	Do you feel like an informed consumer regarding alternatives for single-use plastics?	(Greibitus et al., 2020)
Who is responsible for being environmentally friendly? Understand consumer behaviour		
Objective 5	Do you feel responsible, or do you feel influenced to make more sustainably friendly decisions?	(Cherrier, 2006); (Orzan et al., 2018); (Cummins et al., 2014)
	When purchasing a product what do you pay more attention to? (Example like price, if it is made of alternatives materials, quality...)	(Orzan et al., 2018)
Objective 2	Do you read the label when it says a product has some component that makes it more ecologically friendly? (For example, use of biodegradable plastic)	(Harding et al., 2017)

Objective 5	Do you believe your consumption decisions can have an impact on the environment? If yes, why? / If not, why?	(Cummins et al., 2014)
	How do you feel about recycling?	(Foteinis, 2020)
	Do you usually recycle?	(Herberz et al., 2020); (Yurtsever, 2019)

The consumer perception

Objective 3	Do you feel keener to go for a brand that you know is environmentally responsible?	(Cummins et al., 2014)
	Do you believe in brands that state that are environmentally conscious?	(Cummins et al., 2014); (Viera et al., 2020)
	Do you try to be informed by your own means, or do you believe when a brand says something is sustainable?	(Viera et al., 2020)

Source: Self-elaboration

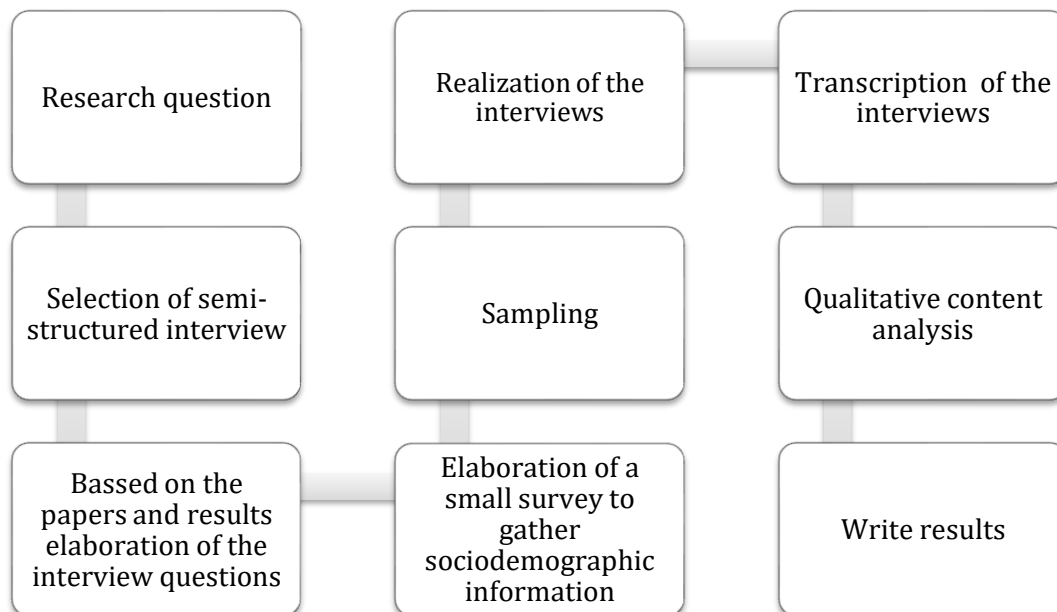
4.3.2. The interview process

For the purpose of the study, 12 people were interviewed. The participants were approached through a digital channel. The sampling was chosen to have in consideration the characteristics presented during the small questionnaire. Also the participants must be consistent and represent or have

knowledge regarding the research topic (Morse et al., 2002). For the present study, it was important if the participants knew about the theme, but for the veracity of the research, it is crucial if the interviewees are not influenced in any way to answer the questions in order to have a positive or negative outcome about that theme. All the interviews were conducted in Portuguese and later translated to English to be transcribed as well as voiced recorded with the permission of the participator. All the interviews took place via digital media (zoom call) because of the current pandemic situation (covid-19) and took between 15 to 20 minutes.

The stages of the entire process to accomplish the interviews are illustrated in figure 3

Figure 3 Stages of the interview process



Source: Self-elaboration based on (Young et al., 2018)

4.4. METHODS FOR DATA ANALYSIS: QUALITATIVE CONTENT ANALYSIS

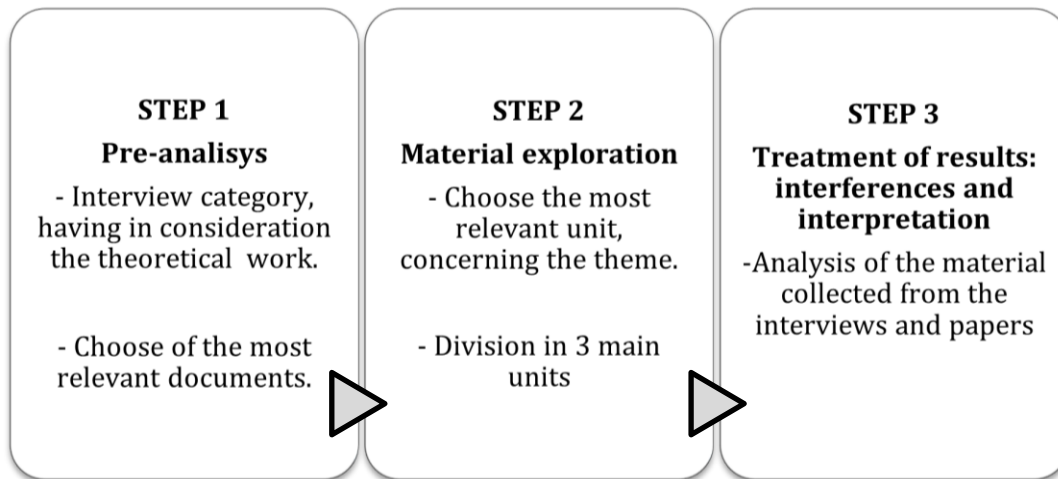
The interviews were transcribed to pass them into a process of qualitative content analysis. This process is essential to ensure the trustworthiness of the data collection and sampling strategy (Elo et al., 2014). The method chosen was the qualitative content analysis by Laurence Bardin (Bardin, 2009).

The Bardin approach for the qualitative content analysis is based on 3 steps (Figure 4). The first step is pre-analysis, this phase is developed to systemise the initial ideas. It starts with the entire reading of the material collected (in this case the semi-structured interviews) and the organization of the relevant topics.

The second step is material exploration, which is when the codification begins, a unit needs to be chosen as a criterion, this means the text, needs to be “cut” in different units, every paragraph needs to be part of a unit. These first units are grouped having in consideration the themes in discussion and are the first categories. After that, the first category is grouped in a thematic formatting the intermediate category, and this one is grouped considering the occurrence of the theme and is the final category.

The third phase is the treatment of results: interferences and interpretation, at this phase, the researcher need to use all the material collected, interviews, papers and observation and understand where are crossing of information, or the differences shown (Silva, Ivete, & Fossá, 2015).

Figure 4 Categories for qualitative content analysis



Source: Self-elaboration based on (Bardin, 2009)

In order to get a more detailed explanation of how the interviews were transferred into analysable content, the next subchapters will describe the 3 steps according to (Silva et al., 2015) that uses the (Bardin, 2009) method.

4.4.1. Pre-analysis

The first step is the pre-analysis, for this category, the researcher read the transcript and highlighted what seemed relevant at first glance. Every interview needs to be selected together with the information collected by the first survey.

During the process of the interviews, it was underlined some observations done by the researcher. One had to do with a particular question:

Do you believe in brands that state that are environmentally conscious?

This question made people a little uncomfortable and doubtful of their own choices. Some of the participants had a nervous laugh before answering it or answered in a way that suggested an obligation in believing in brands but were not entirely sure. It was witnessed as one of the hardest questions to answer during the interview. Some examples are transcribed below (represented with the N and the number of the interview). The content of the answers will be analysed later with the results of the content analysis in chapter 5.

- *“The magic question, I do not believe, I believe companies had to make money...” N-6*
- *“But this, is a really ethical question, it is like, I have to believe...” N-7*
- *“No, I mean *silence* ok, I do not know which brands we will be talking about, but none can it says is 100% ecologic...” N-11*
- *“I think so, I mean, if they say it, we hope so.” N-2*
- *“I have to believe, I do not have a way to prove, unless that there is something that shows me the opposite...” N-5*
- *“Yes, let us say yes, although I know that probably there are some that are not so conscious of what they are doing...” N-8*

The remainder of the interview went effortlessly. Some questions were visibly harder than others. However, it changed according to the participant and the different lifestyles or experiences they had.

4.4.2. Material exploration

This step started the coding process. Everything that included statements that represented consumer behaviour, opinions, and concepts were coded. It was paid attention to patterns in the answers and similarities in between interviews. The process of coding had into consideration units of frequency like a word or expression that made sense with the literature like the following example:

- *"...I do not know..." N-11*
- *"...I have attention to that..." N-12*
- *"... Because I watch documentaries..." N-10*
- *"... for the future generations..." N-4*
- ...

Different participants manifested disinformation regarding a topic or expressed doubt, so the expression *"I do not know"* was regularly used. Another example and opposite to the first one are *"I have attention to that"* this was often used while explaining the shopping experience. *"Because I watch documentaries"* was used by some of the participants to represent knowledge in a specific topic. And *"For the future generations"* was often represented regarding the concern for the planet's future if the rhythm of pollution remains the same.

These examples are only a few that appear during the coding process, every phrase of which interview was, analysed and correlated. The interviews were summarised to find additionally touchpoints and to have the main results.

The coding process also selected a larger amount of text with information, which had similarities between interviews like the example:

- "Yes, for example here at home, we have done a tone of changes, for example, we do not use a sponge to wash the dishes, we bought a loofah, that is basically a sea sponge, for example there are certain practices that we do to save water, we practically do not use plastic bags, we use reusable bags or paper and so on"

N-9

This example represented the code "*small changes*", where the participants explained changes that were made in their daily lives to be more sustainable or advocate for the need to adapt for a different day to day lifestyle, this was possible to categorise by having the summaries of the questions. Some answers had the words "*routine adaptation*", others had the description of routines that started to be part of the daily life of the participants, all of them had something in common, so, they were coded.

Additionally, some questions have a greater importance than others which were created to only know general information's, for this, a deeper coding level was created having into consideration some meanings behind the words, like the following example:

- "... the shopping habits can have a bigger sustainable attitude, by avoiding products with a lot of packages, because it is kind of hard to buy stuff without the plastic packaging..." N-11

This excerpt of a participant interview exemplifies the category for “*lack of attainability*”, which was created to represent thoughts shared by the respondents concerning problems with difficult accessibility to be successful. Most of these concerns were regarding the power of a third party, like governments that need to reinforce new regulations, companies that need to adapt their products and lastly initiatives to encourage different behaviours. For this code, it was not necessary to be said a specific word.

All codes were developed using a rigorous process. Every interview was analysed, and no element was put aside, no matter the reason. All interviews were recorded with the consent of the respondent, this allowed if needed, the interviews to be studied and reviewed countless times if necessary for the analysis to be more meticulous. Having these recordings, every pause, silence or laugh could be evaluated by the researcher if relevant for the study (Silva et al., 2015). At the end of the interviews, most participants dialogued with the interviewer about concerns and ideas they have, however, these conversations will not be taken into consideration for the studies because the recording was off and cannot be entirely accurately transcribed, also it could be influenced in any way by the research knowledge for these reasons and to avoid any bias, these conversations will remain out of the investigation. The coding process was done with the app Delve tool to make the process more effective.

After concluding the coding process, it was developed the first categories. The first category had in consideration the first impressions after the coding of the transcribed interviews, and the literature found previously, as well if it made

sense with the proposed objectives of the study. Which category selected is based on lines spoken by the participants (represented with the N and the number of the interview) and the theoretical work made previously.

A total of 14 initial categories were selected (Table 5).

Table 5 Content analysis initial categories

Initial Categories	
1) Lack of attainability	<p><i>"...there are few supermarkets, that have the option to buy bulk..." N-11</i></p> <p><i>"... More information and awareness are also needed..." N-3</i></p>
2) Behavioural analysis	<p><i>"... when I am going grocery shopping, I pay attention to the price, but also the environmental impact, for example the water, transportation how it is packaged I have all that into consideration." N-10</i></p> <p><i>"...I have never research about that, but I believe so, because if it is bad to the environment..." N-1</i></p>
3) Product characteristics	<p><i>"...If I really need it, and then the price, material and quality." N-3</i></p> <p><i>"... bigger packaging and certain brands ..." N-5</i></p>
4) Environmental concern	<p><i>"... how much time single-use plastic takes to deteriorate, and automatically impacts the air quality..." N-3</i></p> <p><i>"...I am worried about my childrens future..." N-12</i></p>
5) Information dissemination	<p><i>"...I watch documentaries..." N-10</i></p> <p><i>"...if I know a certain brand is linked to sustainable initiatives..." N-5</i></p>
6) Disinformation	<p><i>"No, I never read the labels." N-11</i></p> <p><i>"...I could be more informed, and I would like to be more informed." N-5</i></p>
7) Routine adaptation	<p><i>"...ended up being embedded in our routines..." N-11</i></p> <p><i>"...maybe just that one person really made a difference..." N-7</i></p>

8) Greenwashing or distrust	<p><i>"...There are companies that says are one thing, when they are not." N-8</i></p> <p><i>"Yes, we live in a time when that symbol is printed out too easily..." N-9</i></p>
9) Governmental and corporative responsibility	<p><i>"... Specially the government and the big companies, because I believe there is a tendency to blame the individual..." N-3</i></p> <p><i>"... There is no big investment, I know the European union is going to force the organic waste collection..." N-10</i></p>
10) Personal responsibility	<p><i>"Yes, I feel responsible, I feel that is my duty..." N-10</i></p> <p><i>"...I believe everyone should be responsible for their actions..." N-6</i></p>
11) Specific topics of concern	<p><i>"...the human price and the ecological price, that a person has to pay to reach us ..." N-9</i></p> <p><i>"Especially marine level, to the marine animals because the microplastics..." N-4</i></p>
12) Communication	<p><i>"...I will influence other people with my decisions..." N-10</i></p> <p><i>"... because the information I have and my values..." N-3</i></p>
13) Use or avoidance of single-use plastic	<p><i>"...the less plastic used is going to be better..." N-2</i></p> <p><i>"...in each house there is always a package of swabs..." N-1</i></p>
14) Positives and negatives consequences	<p><i>"...I believe there is always a bad and good impact..." N-11</i></p> <p><i>"...long-term if we see the environmental impact is much smaller..." N-10</i></p>

Source: Self-elaboration based on (Bardin, 2009)

The intermediate category is established on the subjective perspective of the researcher to identify the concept having as based the first category and the narratives of the interviewees. It was selected 5 intermediate categories by gathering in groups the initial categories created. Table 6 shows the first

intermediate category created was “*Social and environmental commitment*” this category describes the actions and attentions the participants shown on a personal level.

Table 6 Intermediate category. Social and environmental responsibility

Initial category	Guiding concept	Intermediate category
2) Behavioural analysis	It points out the attention of certain behaviours of the consumer, as more or less worried about sustainability.	1) Social and environmental commitment
7) Routine adaptation	The adoption of new routines or change of personal behaviours to be more sustainable.	
10) Personal responsibility	The feeling of personal duty to contribute to a change.	

Source: Self-elaboration based on (Bardin, 2009)

Table 7 represents the “*Dimension of sustainable concern*”, which represents a collection of problems the participants find and brings them worry in their lives. It could be specific topics or more general, or it could be related to how much they want to avoid plastic, but it is still an arduous task. These apprehensions are related sometimes to decisions from the government that need to be made for improvement.

Table 7 Intermediate category. Dimension of sustainable concern

Initial category	Guiding concept	Intermediate category
4) Environmental concern	Reference to the concern about the future of the environment and decisions that are being made.	2) Dimension of sustainable concern
11) Specific topics of concern	A collection of environmental pollution problems and its consequences.	
13) Use or avoidance of single-use plastics	Report the need to avoid single-use plastics or how it is still so easy to choose plastics.	

Source: Self-elaboration based on (Bardin, 2009)

The third intermediate category represents “*Consumer awareness*”, how the information is perceived, treated, and selected by the participants and later used in different scenarios it can be found in table 8.

Table 8 Intermediate category. Consumer awareness

Initial category	Guiding concept	Intermediate category
12) Communication	How it is perceived the influence one can have in other.	3) Consumer awareness
5) Information dissemination	It shows how the interviewee collects information and explain to others.	
6) Disinformation	Represents the lack of some knowledge in certain themes for different reasons	

Source: Self-elaboration based on (Bardin, 2009)

Table 9 represents the “*Action, responsibility, and marketing communication*”. It is related to how the company or government communicates the responsibility they are accounted for and actions taken to help the environment, using the perception and opinions of the interviewees.

Table 9 Intermediate category. Action, responsibility, and marketing communication

Initial category	Guiding concept	Intermediate category
8) Greenwashing or distrust	Denotes recognition of some distrust of the ones in power, the fear to be misled.	4) Action, responsibility, and marketing communication
9) Governmental and corporative responsibility	Reference to the importance to help make a change, or even attribution of responsibility.	
1) Lack of attainability	Explains the interviewee perception and the therefrom arising conflicts.	

Source: Self-elaboration based on (Bardin, 2009)

Lastly, the final intermediate category is the “*Choice’s indicators*” created by the combination of characteristics looked for in a product, and it shows the awareness the participants have about the impacts they could have in the environment with their behaviours (Table 10).

Table 10 Intermediate category. Choice's indicators

Initial category	Guiding concept	Intermediate category
3) Product characteristics	Explains the perception of the respondent about the main characteristics when choosing a product.	5) Choice's indicators
14) Positive and negative consequences	Denotes the recognition of impacts	

Source: Self-elaboration based on (Bardin, 2009)

The final category represents the results from the first and intermediate categories. It is basically a summary of the 2 categories to find the common denominator in this case. It was found 2 final categories.

The first final category, "*Internal and external influences of buying behaviour*", is a collection of all subjects consumer-related, talked about by the participants of the interviews, it gathers different ideas of what influences their lifestyles, and mostly their buying behaviour (Table 11).

Table 11 Final category. Internal and external influences of buying behaviour.

Intermediate category	Guiding concept	Final category
1) Social and environmental commitment	Represents the perception of the participants about behaviours, and adaptations.	1) Internal and external influences of buying behaviour
3) Consumer awareness	Represents information or lack of it, all the external factors, or when a participant can help be an influence.	
5) Choice's indicator	Explains the process of choosing a product, and the resulting impacts, from their behaviours.	

Source: Self-elaboration based on (Bardin, 2009)

Lastly, the second final category is “*Management and ethic responsibility*” it explains the concern of the respondents regarding the position and power of the big organizations or government associated with environmental concerns they showed (Table 12).

Table 12 Final category. Management and ethic responsibility

Intermediate category	Guiding concept	Final category
2) Dimension of sustainable concern	Indicates the concerns and information regarding pollution.	2) Management and ethic responsibility
4) Action, responsibility, and marketing communication	It shows a collection of apprehension and actions need to make a change.	

Source: Self-elaboration based on (Bardin, 2009)

4.4.3. Treatment of results: interferences and interpretation

Based on the (Bardin, 2009) method, this qualitative content analysis was created with the intention of describing in a systematic way an analysis to a qualitative research.

At this last phase, the findings from the material exploration category, plus the outcomes discussed during the literature review, were compared and interpreted by the researcher, the results can be found in chapter 5.

5. FINDINGS AND DISCUSSION

To complete the findings and discussion, the analyse was split into the 2 final categories. In order to support the analysis of the findings and discussion the transcripts will be whenever possible compared with the literature.

5.1. INTERNAL AND EXTERNAL INFLUENCES OF BUYING BEHAVIOUR

According to the literature, the consumer is crucial for the alternatives to be a success, after all, the consumer is the one that is going to purchase them (Confente et al., 2020). Focusing on that, this chapter is going to discuss the part of the interviews examined by the content analysis related to behaviour.

One of the problems discussed in the literature is attitude- behaviour gap is when the positive attitude regarding sustainable alternatives will not be reflected directly into action (Orzan et al., 2018). During the interview, it was possible to see this factor.

- "... it is obvious that each one of us should have that in attention, because step by step, we can improve, but obviously, it has to start somewhere." N-1

This participant knows about that something must be done, however in the course of the interview shows no intention of doing it. When asked about taking new measures that are considered more sustainable for example.

- "... I know if in every home you take some action to not harm the environment we can get there however, here at home we do not do anything, because we are used to that, and we do not want to change N-1

The price, was something referred during all the interviews as an obstacle to choose alternatives, even the literature, put that as a “problem” however, in this interview the obstacle per se, was the dependence on the same routine, this attitude-behaviour gap was detectable again in another interview, for the same reason, although, this one complained about the importance of price as well, and shown that, as being one of the main obstacles.

- "... usually, there are quite big (referring to choose to purchase shopping bags whenever goes to the supermarket because it uses for garbage instead of using a reusable bag or buying garbage bags), they never are, how should I explain, that type of bag that we want. There it is, maybe I am trying to excuse, but maybe it is a little negligence, instead of saying it does not work for me, in reality maybe it is neglect than anything else" N-7

However, during this answer, the participant started to see that maybe the explanation does not sound coherent or made much sense. This participant has shown real interest in the environment throughout the interview, by watching documentaries and be informed until certain extent, unlike **N-1**, who admit to not research about the sustainable problem, only knew basic information and the fact that the use of single-use plastics is bad, and something

must be done. Although the participant show interest in the environment, it is not directly reflected in the purchasing (Orzan et al., 2018). That is why these two interviews reflected in an attitude-behaviour gap, both participants choose not to change their habits even though they defend that something must be done, they prefer to justify their actions or, in the case of **N-7**, believe some of the answers are actually excuses.

*- "... I do not differentiate the type of products I purchase, if I have to buy plastic I buy, it is sad, but it is true." **N-1***

*- "... at the supermarkets normally, they have those expensive plastics, they are not even plastics, they are reusable bags, it is always a good alternative, but for example, I normally use the grocery bags as garbage bags are practical for me, I am "reusing" the bag, but at the end is not a good excuse I know... "**N-7***

This problematic is related to the value of self-identity, talked about in the literature review. This value is how the person sees itself, and the decisions it takes to have the sense of belong for example in a group (Confente et al., 2020). Although, in this case, the participant does not feel keener to buy a sustainable product, instead, disapprove their own actions. It could be interpreted as a way of self-validation, they are validating their behaviour as something negative and being, in a sense moulding their behaviour for social approval, in this case not affecting their actions, only their speech. Which in a way rebut and approve the theory explained by (Cherrier, 2006) because in the case of this interview did not encourage the participants to lead to choose alternatives.

As stated previously, in almost every interview, the price was an important decision-maker when purchasing an alternative.

- *"Price/ quality" N-2*
- *"... if at the moment I could opt for the alternative and have the money for that ..." N-3*
- *"I should have more, a lot of times we go looking for the price..." N-4*
- *"I always try to choose the alternative unless it has an absurd price..." N-5*
- *"... if I have a sustainable option that is not the double the price, for example I choose that." N-6*
- *"...normally the alternatives are too expensive..." N-7*
- *"I have to be honest, of course, the first thing I notice is the price ..." N-10*
- *"Here we have the problem that is the price, we try to go for sustainable options unless the price seems a little different, I try to go for the most sustainable unless monetarily the actual price does not pay of..." N-11*
- *"... first are the price, that are more expensive. I am not seeing any disadvantages except the costs." N-12*

Even though the question would not be directly about the price, the respondents will explain the discrepancy of prices between a traditional product and an alternative. Even with different monthly salaries (observed in the survey), the price is something all the interviewees have in consideration when looking for an alternative and point to that as an impediment. During the literature review, the authors also put the finances as a heavy decision-maker.

Defending that even people that are considered environmental conscious will opt for the cheapest option (Orzan et al., 2018).

Regardless, informed consumers are predicted to choose environmentally choices because it is believed they will go to a process of considering specific characteristics (Grebitus et al., 2020). During the interviews that was in fact happening, the more, the consumer was informed of the impacts and consequences their choices had the more, they prefer a different routine and lifestyle.

- "... when I buy a chocolate, I try to have into consideration where it was produced if it has all the sustainable certifications and if they do slave work ..."

N-10

- "At impact level, it is only final impact. ... If we have a cookie package, I choose the one that only has one plastic wrap and is not subdivided into little packages..." **N-11**

The first example, the person works as a marine biologist and give that explanation as why it is so informed about the environmental problems and all the changes done in the day-to-day life, to contribute to a better world.

- "... it is very present in my head, if I was an engineer, or worked at a pingo doce supermarket, maybe I was not so worried about that, but as my work requires it, it is always really present in my head." N-10

The second example sees documentaries and television shows, about the topic, and the different between the two is that the first one is concerned about

the life cycle assessment of the product, when the second one also knows of the existent of that, and the different impacts a product could have during the production, however, it only worries with the final impact. The final impact is the one, the consumer has a say in it, by recycling or, reuse it if possible.

The life cycle assessment and the proper disposal of the products are referred to by researchers as an essential contributors to reduce pollution (Changwichan & Gheewala, 2020; Yurtsever, 2019).

Furthermore, the level of information the respondents show along the interview, the more habit change and the use of alternatives was recurrent. The most common among the interviewee was the elimination of plastic bags, to reusable bags, the use of straws made of another material, and water bottles, made of something other than plastic, this last one although when used the plastic one is reuse for several times before discarding them.

Similarly, is the knowledge exhibited regarding single-use plastic alternatives and the consumer perception related with the impacts these “new technologies” could bring, or some difficulties connected to them.

- “... I heard people say sometimes the alternatives, for example, paper is only viable used a determined number of times because of the water it takes to produce...” N-3

- “I believe are a good solution, but could be better and could be more accessible and in more quantity...” N-4

- “I do not have any massive concerns regarding the alternatives, because is not something mass-sold has not emerged problems about them yet.” N-5

- *"They are (a good solution) for the simple fact of not being plastic ..."* N-9

- *"Yes, I believe the alternatives are a good solution, I believe having a variety of things is good, because we are not depending on one option. And how should I say this, the alternatives are a good solution because they are still developing..."*

N-10

- *"It depends, there are alternatives that are a good solution, if is there a solution for a less sustainable problem, it ends up being positive..."* N-11

- *"...I am not seeing any disadvantages unless the price."* N-12

The general perception is that the alternatives are a good solution because are a swap of something that is common knowledge of being harmful, the plastic. However, only a few of the consumers interviewed, knew that some alternatives, could end up having different levels of impacts when used, though the use of some plastics could end up having a smaller impact than used paper for instance. Although, the literature, also defends for that to happen the consumer has to reuse the plastic material for a certain number of times, before disposing it, which usually does not happen (Civancik-Uslu et al., 2019). A practical example, of the weight knowledge has, is the perception of one of the interviewees that have acquire knowledge from sister influence, and once again the participant that has information regarding the theme because it is related with the work it does on a daily basis.

- "... The simple fact of using a paper bag instead of one of plastic, we are doing a big difference. Because a paper bag takes 2 days I think to decompose, when a plastic one takes several years..." N-9

- "The alternative without a doubt, because single-use plastic is not a solution at the moment. I would choose as an alternative paper, or biodegradable plastic, if the single-use plastic was 100% recyclable I considered instead of paper, because paper has a big ecological footprint because of the use of water..." N-10

Once more, the consumer is concerned over life cycle assessment instead of only thinking about the final stage of a product's life. Of course, both have different importance and impact levels, the problem of relying on recycling (thinking on the end of the product) is the improper disposal, of some products (Chitaka et al., 2020). Some plastics, including the alternatives, could end up being improperly disposed. The biodegradability of some of the alternatives need to have some specific atmospheric conditions to be able to deteriorate. Consequently, even with the best of intentions, the consumer could end up polluting (Viera et al., 2020).

In other words, this interest and knowledge of the consumer end up encourage positive behaviours and ultimately the change or adaptations of routines.

- "... at my workplace, at the beginning we used to buy plastic coffee cups, and from a given point we started to take our own cups and wash them..." N-2

- "... I also look for biodegradable products, here at home we have that concern like the case of the cotton swab." N-4

- "... I try to opt for packages that I see are less harmful to the environment, bigger packages and certain brands that have started to adopt another type of packages without plastic, I always try to buy that..." N-5

- "... if I go out to eat with my family and take the rest of the food home, we never throw away the takeaway boxes, we always reuse them." N-6

- "...if we educate ourselves, and start doing things we were not used to do, it is always a matter of habit for having a better future globally..." N-8

- "... I prefer to use my reusable straw, I like to reuse, I like to always use the same stuff go shopping with the same bag..." N-9

- "...it is easier to go to the cabinet and take a plastic water bottle, but the fact of washing the bottle and fill it with water, its starts to become a routine..." N-11

For some, it starts to become a habit, they do it automatically, and do not dispense too much time and energy doing the change to an alternative product or change behaviour to not dispose so much single-use plastic. Most of the respondents, answer positively to this change of routines in their daily lives to alternatives, even with the facilitation of single-use plastics. In one of the interviews, it was referred the creation of alternatives that are not entirely needed.

- "... the sustainable straws from my point of view are kind of useless" N-6

- "... I am not in real favour of sustainable straws, it could be used only if it was an Ucal or Compal because has a cartoon box, other than that people can drink by the glass." N-6

It was the only person to question the existent of some alternatives instead of encouraging the reduction or elimination of a product like (Herberz et al., 2020) refers, for example, the creation of legislations (like plastic bags ban and straws ban), sometimes stimulate a shift of material and not an exact solution. This could raise the question if the consumer is really changing routines or the industries are only swapping product materials for ones apparently considered more environmentally friendly.

Hereupon, it was found during the interviews the assignment of responsibility not only to the consumers but also to the government and industries, for being entities with power.

5.2. MANAGEMENT AND ETHIC RESPONSIBILITY

During the course of the interviews, the concern over the future of the planet and some difficulties found to be more sustainable were appellant. The consumers, shown apprehension and the need to take measures to help improve the process of becoming more sustainable. In other words, the government's lack of support to encourage recycling, the lack of diversity with alternatives, or the lack of trust in the industries are some of the complaints.

The consumer knows it is not discharged of guilt, against what (Evans et al., 2020) referred, but believe the weight of the industry will have a more significant impact than small changes they could do in their routines.

- *"... maybe who has the biggest consumption, like the industries, that are bigger and have a bigger dimension, but obviously every one of us..." N-1*

- *"...it is not only the politicians, but people also have a bigger part in society..."*

N-2

- *"Mostly the government and the industries, because I believe there is a tendency to blame the consumer..." N-3*

- *"All of us should be careful with the environment, although our politicians should create policies that help people to easily create sustainable habits, and also the teachers at school..." N-4*

- *"Us individually with the different attitudes but also our government and non-governmental institutions..." N-5*

- *"All of us..." N-6*

- *"Without a doubt the government and the big industries..." N-7*

- *"... I believe is 50-50 with the industries." N-8*

- *"...it is a really small percentage compared with the big industries." N-12*

The answers are unanimous, the participants know they hold responsibility however, the government is the one that can provide the tools to help. Can be to deliver a recycling bin for every home like one of the interviewees said the city council provide.

- "... because my city has provided that, because if I have to remember where the common bin for the building is, I had to walk a long way to be able to recycle, and maybe it would not work to do it every single day..." N-10

Alternatively, it could be by creating legislations to prevent the use of some single-use plastics. The reality is that the consumers think the government must take measures, so some sustainable actions are complied.

The participants showed genuine concern regarding the use of single-use plastics and the impacts that products bring to the planet's future. The interest in watching documentaries already referred gave these consumers precious information's that made them more aware of the plastic problem. So, it can conclude that the interest in the government's action and the industries' responsibility is to see something actually start to be done.

- "...I say this because I work at a company that I know the plastic use is excessive." N-7

- "... people are like lambs, I'm sorry the use of words. But it means if it says in the law, people do it, and understand why they do it..." N-10

The majority of the participants admitted not using single-use plastics daily unless it cannot be avoided, even though it is such a cheap and versatile material (Herberz et al., 2020). Also, some of the respondents additionally demonstrate knowledge of the problem of microplastics and what that can represent to the public health.

- "... I believe what they say the microplastics are implements in the fish, this means the fish ends up absorbing the plastic ..." **N-7**

- "... in reality they never disappear, they transform in really small particles of plastic almost like sand, or something similar, and are always present..." **N-11**

This extended concern makes the consumer avoid some type of consumption habits. The documentaries are being a positive impact on the fight against plastics, and as referred by the researchers, these messages passed to the consumer helps them have a different perspective and change behaviours, opting for something possibly more sustainably friendly (Greibitus et al., 2020). This newfound knowledge also makes the consumer look for answers within organizations with more power, like the government.

Beyond the government is the importance of the industries since they are the creators or resellers of the single-use plastic alternatives. During the interview process, the perspective is the lack of confidence the consumer has in the industries and companies, so much in the part of promoting the products, or as discussed in the previous sub-chapter, the practised price. As found during the research, the problem is the fear of greenwashing together with the solo profit motives of some companies (Cummins et al., 2014).

- "... A company has to make a profit, so it has to sell what the consumer wants. If the consumer wants sustainable products, we must give him/her that, so we made sustainable choices, and not exactly because they want to be environmentally friendly." **N-6**

- *“Basically, I do not believe until I have proof, because we saw too many examples where they put a nice label saying is environmentally friendly, or this animal had a happy life, and we came to a conclusion is not true” N-9*
- *“This question of environmental responsibility it is still a very fine line, in which sense they really have environmental responsibility...” N-11*

These answers result from the “problematic” question, previously explained during the qualitative content analysis as the hardest to answer. It was denoted some discomfort in answering, possibly because the former question was:

Do you feel keener to go for a brand that you know is environmentally responsible?

Where even though the participants show some hesitancy, they answer it positively. They believe it is necessary to do their own research beforehand. However, when questioned, if they read the product labels when it says it has some environmentally friendly component, only 3 of the interviewees answered it positively. This proves that some sustainability messages between the consumer and the industries are failing, although they are important so the consumers understand the type of impact they could have (Cummins et al., 2014).

However, seeing the results of the interviews, and the suspicious, concerning the industries, the fear of greenwashing is too much present, and the

tactic of some industries to take the consumer to be wrongly advised does not help the marketing of the ones who are really trying to make a difference. The own companies creating different regulations instead of using the ones existent also contribute to the consumer's mistrust (Viera et al., 2020). Two of the participants of the interviews also referred to that fact.

- "... has a certification in how it does not mistreat children, or do slavery work. However, they were the ones who created the certification, therefore what validity does this certificate has? But I only know this, because I like to see documentaries, and like to be informed about these subjects..." **N-10**

- "...we live in a time that the symbol is easily stamped, but then explain what that symbol means, is something that the products still fails a lot..." **N-9**

Most importantly, the consumer is looking for answers from part of the ones in power. They could present some attitude-behaviour gap in some aspects of their speech versus their actions. However, the truth is, this consumer has demonstrated to be informed and looking for solutions and at the moment are seeing single-use plastic alternatives as a possible one. They do not discharge themselves of responsibilities, on the opposite, most of them show a positive mindset to change their habits in favour of a better future. Although, they want to see initiative from the entities that have the authority to make decisions for the majority of the population.



6. CONCLUSION

This chapter concludes the dissertation, aiming to answer the objectives proposed in the beginning and present the investigation's contribution.

6.1. RESPONSE TO THE RESEARCH OBJECTIVES

The dissertation had as principal objective to understand if single-use plastic alternatives are viewed as another trend or a good solution on the lens of the consumer.

To perform the investigation, different people were selected, who had different levels of knowledge because it is important to understand how different consumers perceive the alternatives. Some of the respondents were in fact very informed about the theme and knew all kinds of information while others had the type of information of easy access like television or internet and finally also the ones with basic information. With this was possible to study different perceptions and enrich the investigation.

To answer the main objective, 5 objectives were created and will be answered in the points below.

- 1) Identify and understand the main source of environmental impact related to single-use plastics**

Legislations or bans are being created to decrease the use of single-use plastics, for being a product only used once and for a short period of time, which end up being problematic (“Single-use plastics,” 2019).

The participants saw single-use plastics as a massive problem for the environment, and something they believe should be eliminated or reduced to the maximum. They knew the sources of it, like cups from coffee machines that they cannot avoid them, although the majority answered it negatively to use the material. Furthermore, most of the respondents associated using single-use plastics with the development of microplastics and marine pollution.

Thus, to answer the main objective, the consumer knows some of the sources of single-use plastics are several products that end up appearing every day.

However, there is a disinformation regarding single-use plastics that are not associated so directly, like the plastic bags when buying vegetables or fruits. Though, the single-use plastics identified, were associated to end up contributing to marine pollution or could be eaten by the animals that are part of the human food chain.

2) Understand the dimension of the single-use plastic alternatives and their consequences

The consumer needs are essential when developing products that have as objective to be purchase by them, so the creation of alternatives for single-use plastics had to have similar characteristics to the ones made of plastic to succeed (Harding et al., 2017). From the perspective of the consumer interviewed, single-

use plastic alternatives are still far to achieve the characteristics needed. It was possible to identify the consumer's difficulty to make the swap from single-use plastic to more sustainable alternatives. The price is continuously identified as the big deal-breaker and the marketing of the product.

The consumer is receptive to make a change because they believe even though there is not too much information of what impacts these new products may have. For them, if it is not plastic, it is a good solution. However, the lack of choices still presented at the big supermarkets and the fear of the brand not telling the truth about the product's sustainable characteristics take the consumer's confidence to rely on some of those products. However, the most common ones, like water bottles made from something other than plastic or even reusable bags, are pleasing the consumer.

While alternatives are only seen as direct substitutes of plastics, instead, the actual reduction of consumption, as examined during the dissertation, can generate another problem (Herberz et al., 2020). The mentality of "it is good if is not plastic" can become problematic in the long run. Also, the consumer with basic to medium information, has less knowledge regarding the impact of some of the alternatives compared with the plastic products they are trying to substitute. The life cycle assessment of a product is still taken into little account.

3) Understand the perception of the consumer regarding environmental responsibility

The consumer demonstrated that even though they could not comply with changing to alternatives or leading a more environmentally friendly life, they had

almost perfect knowledge of their responsibility. Additionally, even though the companies and the government's responsibility was pointed out, the consumer never believed was released of any responsibility and know that the change of behaviours, even if small, can be a contribution.

4) Comprehend the relation of the consumer with the single-use plastic alternatives

This objective is an extension of the second one. It represents the changes made by the consumer and the adoption of single-use plastic alternatives.

As discussed previously, the alternatives that could be considered more mainstream, that usually are more widespread, like water bottles or cotton swabs, shopping bags or even straws, apparent were well received by the consumer. The simple act of adapting the routine, like instead of grabbing a bottle for example, to wash and to fill it, become the new normal. The ones who shown the most drastic life changes to alternatives, also explained this as something natural and easy to do, only pointing out the lack or difficulty to find some of these new alternatives. It is also something perceived by the consumer that is here to stay and that it needs to be in continuous development.

It is possible to observe that the human being is adaptable and if their values and beliefs defend something they can make the change, as defended by (Confente et al., 2020), appealing to the values of the consumer could be a way for brands to advertise this type of products. Although, as previously stated, the

messages need to be genuine and not only driven by profit, because this consumer has shown to be cautious.

5) Perceive the awareness of the consumer to follow a more environmentally friendly lifestyle

The attitude-behaviour gap (Orzan et al., 2018) continues to be a matter presented in “green” consumption. Although it was less presented than initially expected after the creation of the literature review, it is something that needs to be considered in this type of studies and it is important to understand what it is needed to change that “gap”. The consumers were in their majority, complied to adopt this more sustainable kind of lifestyle. However, only one admitted avoiding or not buying something completely for being potentially harmful to the environment.

Although every person admitted that little changes in their lifestyle could help the environment, even if small, they will not avoid purchase something they want, or for a brand, they are used to, because of that reason. On the other hand, one of the consumers acknowledged not buying any brand that does experiments on animals even if they previously liked it, so again the values of the consumer have a significant impact on their purchasing power.

6.2. CONTRIBUTIONS OF THE STUDY

The theme of understanding the consumer's perception with the single-use alternatives is still sparsely explored together with the perception of their impacts. Hence the reason for this investigation.

The dissertation is looking to contribute to the area of “green marketing” of the companies by understanding the perception the consumer has of alternative products. Although the fact that was not applied a quantitative methodology is not possible to generalise the results, so the contributions are regarding the level of the sample.

In terms of theoretical contributions, this investigation contributed to the literature relative to “green marketing”, focusing on 3 sides of single-use alternatives (bad/ good or only considered a trend) and mostly the perception and behaviour of the consumer.

The investigation also contradicted the previous study developed by (Cummins et al., 2014), where it says the consumer has difficulty understanding the importance they play on the environment. And of (Evans et al., 2020) because they do not believe in being discharged of the blame on environmental sustainability. On the opposite, during the interviews, the consumers were well aware of their importance.

The dissertation also wants to enhance the visibility of single-use alternatives, and as currently done with electric vehicles, the science world to continue to study the long-term impact these alternatives could represent on the planet.

In practical terms, through the obtained results, there was observed a necessity for companies to be more genuine and transparent in their marketing, as a need to obtain new strategies to get closer to the consumer, appealing to their values, or changing the price strategy. Also, it is necessary for the government to be more involved in information diffusion and awareness of the less informed consumers to mostly help on the disposable part of the process.



7. LIMITATIONS AND FUTURE RESEARCH

Due to the subject's size under investigation being alternatives and consumer perception, the present dissertation can only contribute with a small insight. Saying this, the investigation had met some limitations.

Firstly, the methodology approach chosen, even with all the potential to observe the consumer and have their thoughts more explored than with a survey, create the impossibility to have a generalized result which can be a limitation.

Secondly, even though there is almost unlimited literature regarding the plastic problem, the same does not happen with the alternatives, existing a limited number of studies that compare the use of single-use plastic alternatives with the consumer and its importance in the success or not of them. This does not happen when researching other types of alternatives like electric cars, for example, where an extensive range of literature appears, being about positive or negative impacts.

Considering this, it is suggested to future research to make a quantitative approach to understand the generalization of the results, it should be used type-questions related with the perception of the consumer and the behaviour with the alternatives.

Also, as shown during the findings and discussion, understand the dimension of the habit changes of the consumers regarding alternatives and reduction, understand if they are only changing materials or adopting a new way

of thinking. Also, try the inverse study and understand the perspective side of the companies regarding single-use plastic alternatives and the relation with the consumer's buying behaviour. As well as to understand the use of marketing to pass a message to the consumer, and how it can improve the “green” image of the brand. Also, as referred sporadically during the research, the need to understand how companies can improve their products by rethinking them to avoid creating some alternatives altogether, to this way, contribute to the reduction instead of only changing materials.

In summary, the theme of alternatives is normally study, to understand the advantages of the new materials to replace plastics instead of focusing on the “dark” side of it. Facing the conclusion of the study it is important to give a follow up to the investigation, since these alternatives are becoming more and more a presence in the consumers’ lives.

The urgent necessity of wanting to reduce the plastic material cannot be an impediment to understanding if the alternatives created are in fact the best ones.

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APPENDICES

Appendix 1- Interview guide:

- The interviews are planned to have on average 20minutes.
- It was asked for permission to record the interview.
- It will be assured anonymity.

General questions:

- What do you think is someone sustainable concern?
- Do you see yourself as a sustainable concerned person?
 - o If yes, why? /If not, why?
- In your perspective, who should be taken responsible for being more environmentally friendly?
- We are going to speak specifically about single-use plastics. Single-use plastics are, according to the official website of the European Commission, products used only once, or for a short period of time, and then are thrown away, some examples are cotton bud sticks, plates, cutlery, straws...
- Do you regularly use any type of single-use plastic?
- Do you know the impact those plastics can have on the environment?
- Do you believe that single-use plastic pollution can have a negative outcome on your health?

- If yes, why? / If not, why?

Understand the alternatives dimension in the life of the consumer.

- When purchasing a product do you have into consideration the impact is going to have on the environment?
- If you had to choose between a single-use plastic product (for example a plastic bag) or an alternative which, would you choose and why?
- Do you usually pay attention to that type of choice? (Being supposedly a more environmentally friendly product)
- In general, when hearing about alternatives do you see it as a good solution?
 - Can you tell why? / Why not?
- What are your main concerns about alternatives?
- When choosing alternatives do you believe some can have less impact than others?
- Do you feel like an informed consumer regarding alternatives for single-use plastics?

Who is responsible for being environmentally friendly? Understand consumer behaviour.

- Do you feel responsible, or do you feel influenced to make more sustainably friendly decisions?

- When purchasing a product what do you pay more attention to? (Example like price, if it is made of alternatives materials, quality...)
- Do you read the label when it says a product has some component that makes it more ecologically friendly? (For example, use of biodegradable plastic)
- Do you believe your consumption decisions can have an impact on the environment?
 - o If yes, why? / If not, why?
- How do you feel about recycling?
- Do you usually recycle?

The consumer perception

- Do you feel keener to go for a brand that you know is environmentally responsible?
- Do you believe in brands that state that are environmentally conscious?
- Do you try to be informed by your own means, or do you believe when a brand says something is sustainable?

Appendix 2- Questionnaire example and results:

The survey aimed to collect basic information of people interested in participating in the interviews.

Beyond the questions presented below, there were 2 open questions, one for the participant's name, and another for the email to be able to be contacted for the interview.

Characteristics	Share in the sample
Age group	18-24 Years
	25-34 Years
	35-44 Years
	45-54 Years
	55-64 Years
	Over 64 Years
Education	Elementary
	Highschool
	Bachelor
	Master
	PhD
Residence	Rural area
	Urban area

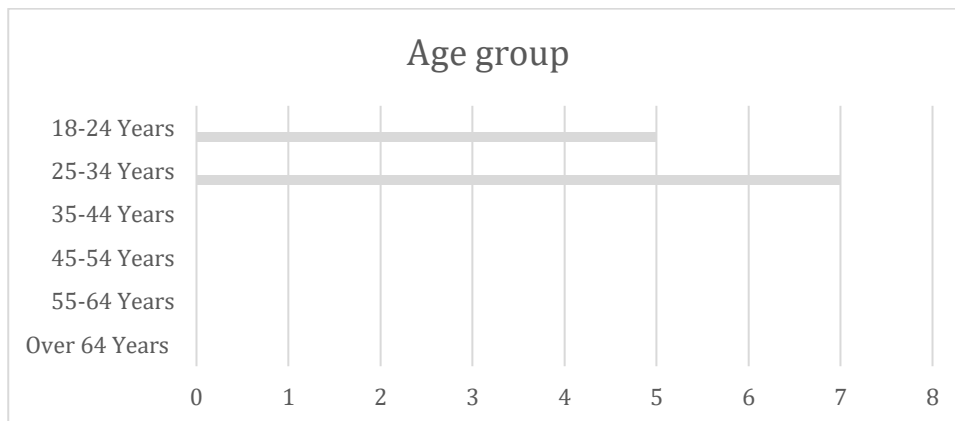
Monthly net salary	Without payment
	Less than 500€
	Between 500€ and 750€
	Between 750€ and 950€
	Between 950€ and 1150€
	Higher than 1150€
Gender	Female
	Male
	Other
	Do not respond
Do you usually pay attention while shopping, to do it in a more sustainable way?	Yes
	No
Are you available to participate in a master thesis interview?	Yes
	No

The purpose of this survey was to collect some basic background information from the participants of the interviews. The survey also had open questions for the name and email so that the participant could be contacted.

This survey allowed to demonstrate that even though the age group of the respondents and education are similar, the answers and opinions during the interviews were distinct. All the interviewees come from an urban area, and it was interviewed 6 females and 6 males.

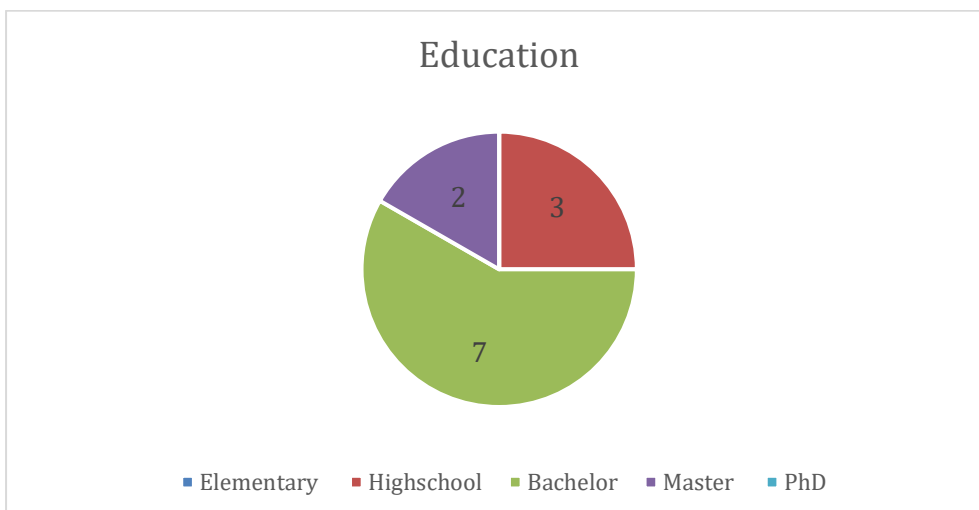
The age background and education can be found in Graphic 3 and 4, respectively.

Graphic 3 Age group



Source: Results provided by google forms

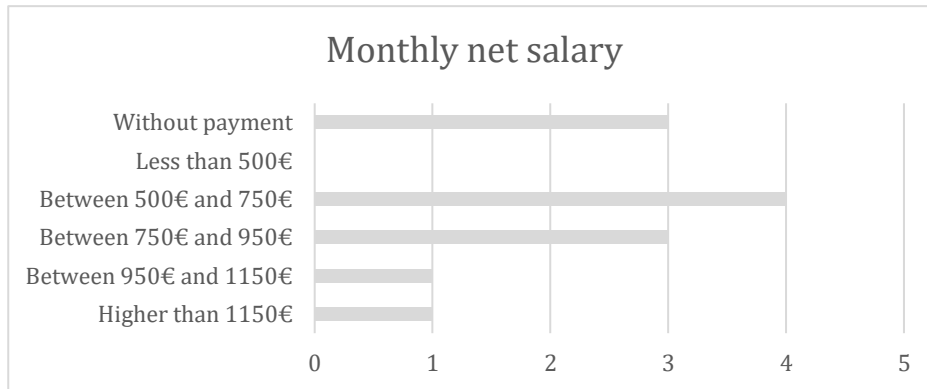
Graphic 4 Education level



Source: Results provided by google forms

In terms of net salary, it had different answers, however during the interview results, it would be possible to see, that price has a heavyweight during decisions, it does not reflect precisely in the answers of the survey (Graphic 5). Some of the respondents have not payment at the moment or have a lower salary and still made sustainable changes in their lifestyle, even though they claim the price is an important factor. The intention is not to generalize but to understand what happened during the study, and explore the participants' experiences (Niaz, 2007).

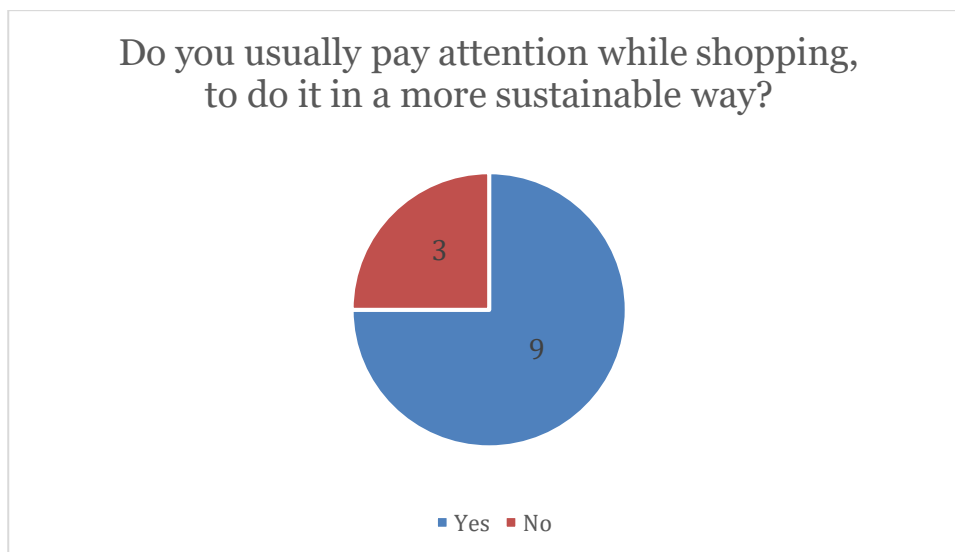
Graphic 5 Monthly net salary



Source: Results provided by google forms

During the survey, it was made only one question regarding sustainability. For the purpose of the study, it was essential to have different perspectives, from people considered more sustainable and others less, to have an explanation from both sides (Graphic 6).

Graphic 6 Sustainable question



Source: Results provided by google forms

Only 3 people answered negatively although, 2 of them had some knowledge and understood the importance sustainability has, only they do not reflect that every time they purchase a product, on the other hand, the other participant has little knowledge and only knew general information about the theme.