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Consumers' perceptions of reusable returnable packaging

By Aline Fort and Michaela Hanusiakova

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Abstract

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Purpose: This thesis aims to explore the extent of consumers' interest in reusable returnable packaging.

Theoretical framework: This study is based on the Theory of Planned Behaviour. Attitudes, subjective norms and perceived behavioural control and their association with the interest in reusable returnable packaging are tested. Additional factors (gender, age, education level, past experience) were added to another framework as they were frequently mentioned in the literature.

Methodology: Deductive research approach, mixed strategy and cross-sectional research design.

Empirical foundations: The empirical data was collected through an online survey created via Google Forms, and distributed through the authors' personal social networks such as Linkedin, Instagram, Facebook and WhatsApp.

Conclusions: The variables associated with the Theory of Planned Behaviour are positively associated with the interest in using reusable returnable packaging. The demographic factors, as well as past experience, are either not associated or weakly associated with the interest in using reusable returnable packaging. Age, education and past experience did not show a significant association with the interest whereas gender showed a weak significant association.

Keywords: reusable returnable packaging, circular economy, Theory of Planned Behaviour, demographic factors

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1. Introduction

1.1. Background

Traditional linear packaging is one of the main sources of waste and has a significant impact on the environment. In 2020, the average amount of packaging waste per inhabitant in the EU was 177.2kg (Eurostat, 2022). Among all the types of packaging used, plastics are the most problematic. At the same time, plastics are the most prevalent type of material that is used for packaging. Since the 1950s, the use of plastic packaging has been growing exponentially (Rhodes, 2018). The packaging sector consumes 40.5% of all plastics produced, which makes it the sector with the largest consumption of plastics in the EU (Fogt Jacobsen, Pedersen & Thøgersen, 2022; Plastics Europe, 2022). The recycling rate of plastics is at 34.6%, with 23% of all plastic waste ending up in landfills (Plastics Europe, 2022). Environmental degradation, to a large extent caused by such waste, is an existential threat to companies and the whole of Europe and the world. Moreover, single-use plastics are not only a threat to the environment but also to human health. For example, particles from packaging end up scattered in the air, and humans risk inhaling them, which is a non-negligible threat to the respiratory system (Amato-Lourenço et al., 2020).

Circular packaging presents a solution to reduce the amount of wasted packaging. Indeed, it is an approach that maximises the lifespan of packaging and reduces waste by involving the use of recyclable, reusable and compostable materials (Corvellec, Stowell & Johansson, 2021). It aims to reduce the negative impact on the planet. Companies have a growing interest in circular packaging, as it helps them to reduce the overall environmental impact and meet sustainability goals. Even major international consumer firms such as Coca-Cola, Unilever and Nestle have committed to use a majority of recycled plastics in their packaging and started to use recyclable and reusable packaging in their portfolio of products (Recycling Magazine, 2022).

The European Commission introduced the European Green Deal in 2020, a set of proposals for making EU policies suitable for reducing greenhouse gas emissions. In fact, its aim is to reduce net greenhouse gas emissions by 55% by 2030 and achieve climate neutrality by 2050 (European Commission, 2020). Companies are, therefore, under great pressure to be more circular. Indeed, the European Green Deal includes the Circular Economy Action Plan and aims for the EU's

transition to a circular economy to minimise waste and maximise the use of resources by using materials and products for as long as possible. Indeed, the Circular Economy Action Plan is a prerequisite to achieving climate neutrality by 2050. The Action Plan focuses on various sectors, with packaging and plastics sectors being identified as sectors with high potential for circularity (Zhu et al., 2022).

1.2. Problem Statement

Circular packaging seems to be promising in lowering the amount of waste, however, its adaptation and success strongly depend on consumers (Miao, Magnier, & Mugge, 2023). To successfully transition to a circular economy, understanding consumers' perceptions and the factors that affect the likelihood of adopting circular packaging is crucial. While much research has been conducted on the application of circular practices on the organisational and industrial level, little is known about the role of different consumer segments in circular business models and how they react to them (Szilagyi et al., 2022; Corvellec, Stowell & Johansson, 2021). While there are many studies on the industrial and organisational levels of circular economy, consumers' perception and interest in engaging in such a system is still an understudied area (Szilagyi et al., 2022). Hobson and Lynch (2016, p.22) mention that "the role, potential and place of the citizen—and indeed the economy as a complex socio-political entity—needs to be subject to further critical consideration, including engagement with more 'radical' ideas about the pathways, aims and roles ascribed to us all within a more circular society." Kirchherr et al. (2018) also identified the lack of consumer awareness and interest as a barrier to the implementation of a circular economy.

Additionally, Szilagyi et al. (2022) conducted a systematic review of over 111 articles and concluded that little study has been done on how to accelerate change at the individual and collective levels in order to facilitate the transition to circular solutions. In their research about the trends in reusable packaging, Coelho et al. (2020) also highlighted that although there are opportunities in both the B2B and B2C segments, the B2B reused packaging systems are more well-known than B2C reusable packaging systems. Thus, this thesis will focus on primary B2C packaging from the consumer perspective.

Moreover, most existing literature on circularity focuses on a specific country and is therefore not truly generalizable. Additionally, it is not focused specifically on the packaging. Indeed, Szilagyi et al. (2022) ran a research project on the factors on an individual level that impact circular purchase behaviour. However, this study was focused exclusively on Romanian citizens, with a majority of respondents being between the ages of 18 to 25. Another paper by Miao, Magnier, and Mugge (2023), which explores consumers' behaviours towards reusable packaging systems, was also only conducted on Dutch citizens. Therefore, there is a need for research on reusable packaging on a broader demographic group.

In addition, previous studies have only addressed the external elements that affect reuse, such as political, economic and social factors, but the psychological influences on consumers' behaviour and expectations have been largely neglected (Suthar, Rayal & Ahada, 2016; Ertz et al., 2017). Hence, this thesis will build upon the Theory of Planned Behaviour in order to understand the impact of attitudinal, normative and perceived behavioural control elements towards reuse.

Finally, past research on circularity has been heavily focused on recycling and reducing, and more attention should be paid to reusable packaging, which is a non-negligible option to mitigate the environmental impact of packaging (Miao, Magnier, & Mugge, 2023). Bradley and Corsini (2023) suggest that unless reusable packaging is socially accepted by consumers, it cannot reach its economic and environmental potential. However, the majority of the studies of reusable packaging focus on the provider perspective and not on the consumer perspective (Bradley & Corsini, 2023). Miao, Magnier and Mugge (2023) also mention that the understanding of consumers' attitudes and behaviours towards reusable packaging systems is limited and calls for further research.

1.3. Purpose Statement and Research Questions

The aim of this thesis is to extend the understanding of consumers' perceptions of reusable returnable packaging by conducting a comprehensive survey. More specifically, the authors aim to explore consumers' interest in using reusable returnable packaging (purchase products in it and return it once empty) on a sample size of at least 100 consumers from various countries. For this thesis, *reusable returnable primary packaging* is defined as packaging that is purchased by

end consumers together with the product and returned once empty to retailers or producers by consumers. The purpose of this study is twofold.

Firstly, the authors aim to fill the gap in the literature on how consumers perceive circularity initiatives, in particular, in connection to reusable returnable packaging. This research builds on existing exploratory studies conducted in slightly different contexts and provides insights into consumers' perspectives, hence contributing to the existing literature on circularity in the packaging industry. The most recurring factors associated with consumers' behaviour identified in the existing literature were demographic factors (age, education level, gender), past experience, attitudes, subjective norms and perceived behavioural control. The relevance of these factors in the context of reusable returnable packaging is examined in this thesis, which complements the knowledge in the existing literature.

Secondly, the study seeks to add to practise by improving the understanding of the perspective of consumers - whether they are interested in using reusable returnable packaging, which variables impact their decision on whether to do so as well as which consumer segments are interested in the reusable returnable packaging the most. This is relevant for companies that are in the process of implementing reusable returnable packaging or that are exploring it as an option for the future. Companies can utilise the research outcomes as guidance on whether, how and for which end consumer segments to implement reusable returnable packaging in their portfolio. To fulfil the proposed research aim, the following research questions are formulated:

1. *To what extent are consumers interested in using reusable returnable packaging?*
2. *Are the factors identified in previous research associated with consumers' interest in reusable returnable packaging?*
3. *Which end consumer segments are the most likely to be interested in reusable returnable packaging?*

1.4. Contributions of the Thesis

As mentioned before, the thesis has contributions relevant to both scholars and practitioners. On the one hand, scholars researching circularity in relation to packaging will obtain new insights into reusable packaging through the lenses of consumers. On the other hand, practitioners will

benefit from the thesis by being able to assess better whether implementing a line of products in reusable returnable packaging is a worthy investment based on the interest of consumers for that type of product. Moreover, companies that are potentially interested in the implementation of reusable returnable packaging will be able to see what factors are associated with consumers' interest in using reusable returnable packaging, which has implications for targeting marketing campaigns. Furthermore, this research will also offer a better understanding of the impact of demographic factors such as age or education on the interest in using reusable returnable packaging. This can also help companies to define their target group better.

Additionally, the study highlights a need for new, innovative companies that would offer returnable packaging solutions. Indeed, moving to a circular business model is a major change for companies that have worked with a linear business model for all their existence, and collaborating with new, innovative actors might help them to make this process smoother.

1.5. Outline

Section *2. Context* contextualises the research questions and defines the key terms of this thesis. Section *3. Literature Review* provides relevant insights from studies and other academic literature. It includes hypotheses that the authors of this thesis formed based on previous research and theories, especially the Theory of Planned Behaviour. These hypotheses are then tested and analysed on a sample population by a survey described in the *4. Methodology* section. The *5. Results* section provides the outcomes of the analysis of the survey responses. The *6. Discussion* section draws conclusions from the collected data and their implications for both academia and practice. The limitations of the study and suggestions for future research are provided in the final section *7. Conclusion*.

2. Context

The following section provides a background in which the thesis is framed. The key terms are defined, and the packaging history, functions, types and materials are described to contextualise the research questions. The section also outlines why authors decided to focus on reusable returnable packaging - not only due to it being an understudied topic in the literature but also because, according to the previous studies, it seems like a promising option with high potential to reduce waste and to be scalable.

2.1. Circularity

Circularity is a burning topic that has been widely discussed by both academia and the industry in the past years. In 2020 the EU adopted the new Circular Economy Action Plan, which aims to decrease the strain on the environment while generating jobs and sustainable growth (European Commission, 2020).

There are different nuances in the definition of the circular economy and some scholars have different definitions for it (Ketelsen, Janssen & Hamm, 2020; Han et al., 2018). Nevertheless, minimising resource exploitation and maximising waste prevention are two things they always have in common (Velenturf & Purnell, 2021). The objective of circularity is to leave behind the traditional linear model of 'take-make-consume-throw away' and to maximise the resources' lifespan. This can be achieved through recycling, reducing or reusing materials. The life cycle of products is extended not only in consumption but also in production. It consists of using less material, developing goods and processes to be less resource-intensive, reusing resources to create new materials and products, choosing lasting products, and minimising resource use (Dagevos & Taufi, 2023).

The most widely accepted definition today is the one from the Ellen McArthur Foundation. It describes circularity as "an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models" (Geissdoerfer & al., 2017, p.759).

In the circular economy, the consumer's role changes greatly (Lazarevica & Valve 2017). Indeed, under the circular economy model, consumers are required to take an active part in the product's lifecycle management. The consumer's role is key in this model, as there is no circularity if they do not recycle the product correctly or bring back the products to the shops in order for them to be reused (Parajuly et al., 2020).

2.2. Packaging

The packaging history dates back to the period when the first humans started using tools (Zhu et al., 2022). The first packaging was probably made of leaves that were used to wrap food (Zhu et al., 2022). Nowadays, we understand packaging as an object that encloses and protects the product during distribution, storage, transport, use and reuse (Coelho et al., 2020). The most important task that packaging has is to protect a product in a secure way (Grönman et al., 2013).

The turnover from the packaging industry in Western Europe represents around 2% of the GDP, with rapid growth every year and the food industry is the major user of packaging, using nearly 60% of total packaging production (Zhu, et al., 2022). To address the packaging industry segment with the greatest impact on the environment, the focus of the current thesis is food packaging and, more precisely, the packaging of groceries.

2.2.1. Packaging types

There are various types of groceries packaging - primary, secondary and tertiary. As outlined by Silva and Pålsson (2022), primary packaging is defined as the packaging that is closest to the product. Secondary packaging contains a number of primary packages, and tertiary packaging includes several secondary packages.

Industrial packaging systems are used in business-to-business settings, and their primary function is to facilitate production, material handling, warehousing and transportation, however, they do not have any promotional or sales value (Silva & Pålsson, 2022). On the other hand, consumer packaging is a business-to-customer system, and its function is not only functional but also promotional and informative. When it comes to industrial packaging, companies have greater control over the packaging life-cycle and therefore are able to implement sustainability and circularity initiatives if they please to do so in a relatively simple manner. Companies can sign

agreements with other companies where industrial packaging can be reused, rented or leased (Silva & Pålsson, 2022). However, when it comes to consumer food packaging, once the product is consumed, packaging turns into waste in the hands of end-consumers. Companies have limited control over how consumers handle and dispose of the packaging. However, in order to reach goals and targets set by the European Union and other authorities, consumer engagement in circularity initiatives is crucial (Silva & Pålsson, 2022). The focus of the current study is, therefore, consumer packaging and consumers' perceptions of circular packaging.

2.2.2. Packaging functions

Lindh, Olsson and Williams (2015), have identified three main functions of packaging as protection, facilitation of handling and communication. The protective function is the most crucial one and has the biggest potential to contribute to or counteract environmental sustainability. Packaging is, indeed, significant when it comes to food waste reduction. If the packaging fails to protect the food in a secure way, the produced waste is not only packaging waste but also food waste. Moreover, packaging has the potential to combat food waste by lengthening the shelf life of food products (Lindh, Olsson & Williams, 2015). For example, the plastic wrap that cucumbers are often packed in prolongs the shelf life from 3 up to 14 days, hence it increases the chance of it being sold and consumed before becoming waste (Turner et al., 2008). Similarly, when broccoli is wrapped in film, its shelf life is increased by up to 20 days (Esturk, Ayhan, Gokkurt, 2014). Hence, even though packaging waste is a significant problem, the packaging is often needed to minimise food waste which has a relatively higher environmental impact than the packaging itself (Lindh, Olsson & Williams, 2015).

The facilitation of handling function also has the potential to enhance environmental sustainability (Lindh, Olsson & Williams, 2015). The features of the packaging that makes it easy to open, pour or reseal also contribute to how much of the packaged food will be consumed before turning to waste.

The last identified function is the communication function of the packaging (Lindh, Olsson & Williams, 2015). The research shows that around 19% to 51% of food shopping is not planned beforehand (Lindh, Olsson & Williams, 2015). This means that consumers rely on information provided on the packaging. Moreover, the material, colours and pictures and text provided on the

packaging may affect consumers' environmental preferences and affect their purchase behaviour (Lindh, Olsson & Williams, 2015). Hence, the communication function of the packaging also contributes to or counteracts environmental sustainability.

2.2.3. Circular packaging

As packaging waste continuously deteriorates the environment, there have been stronger voices requiring packaging to be designed, manufactured and consumed in a more sustainable way (Azzi et al., 2012). Various materials with various environmental impacts are commonly used to package foods that are to reach customers. Steenis et al. (2017) identified glass, bioplastics, liquid cartons (muli-ply cardboard coated with plastics), dry carton sachets (paper), plastics and metal (cans) as the most conventional materials used in food packaging. There are several options on how packaging can be fully or partially 'closed in a loop' and prevented from ending up in landfills - packaging can be designed to be recyclable, reusable, biodegradable, or it can be burned to produce energy. The last option - incineration, is the least circular out of all. The energy is created by burning the packaging waste, however, the valuable materials are lost.

2.2.3.1. Compostable packaging

When it comes to designing and producing food packaging from novel materials that are to be biodegradable, a consensus from the majority of scientific studies has reached that biodegradable packaging often does not equal good for the environment. While assessing the end-of-life of biodegradable plastics, Narancic et al. (2018) concluded that biodegradable plastics are not a solution to reduce plastic pollution. Biodegradable polymer PLA is often regarded and marketed as 100% compostable, however, Rhodes (2019) pointed out that after a year in seawater of 25°C, PLA has not shown significant degradation. PLA does not decompose in a reasonable amount of time under all conditions. To be more precise, highly specific conditions are to be met (e.g. high temperature and humidity) in order for biodegradable packaging to decompose and hence industrial composting facilities are needed for its processing (Rhodes, 2019). The chain of industrial composting facilities is not extensive at the moment, moreover, for different biodegradable polymers, different conditions are to be met, which further complicates the process. Furthermore, Dilkes-Hoffman et al. (2019) pointed out that industrial composting produces methane emissions, which is a greenhouse gas that contributes to global warming. As

the biodegradable packaging option does not seem to be very efficient due to specific conditions that each material needs to decompose, the lack of facilities where such decomposition could occur and the amounts of methane such decomposition emits, the current thesis will not concentrate on biodegradable packaging options.

2.2.3.2. Recyclable packaging

The most widespread practice that has a circularity potential is recycling. However, the rates of recycling in the EU are around 34.6% (Plastics Europe, 2022). The situation is even more worrisome in other parts of the world, such as China and the United States, where the recycling rate is 25% and 9%, respectively (Zhu et al., 2022). The targets and provisions for the recycling of waste are defined by the EU Waste Legislation (European Commission, 2018). According to the Waste Framework Directive 2018/851 (European Commission, 2018), the municipal waste targets for reusing and recycling are set to be 55%, 60% and 65% by 2025, 2030 and 2035, respectively. However, many materials that are used for food packaging are not recyclable, and even if they are, they are often not 100% recyclable. Recycling also often degrades the material to lower quality due to changes in the chemical properties of the materials (Babader et al., 2016). Moreover, recycling requires energy and water for the materials to be cleaned thoroughly, processed, and later, additional energy is needed to ship the recycled material and produce new products from it. Therefore, growing interest is observable in reusable packaging systems. According to Bradley and Corsini (2023), 75 % of articles about reusable packaging have been published within the last decade. Even though it is crucial to continue with the efforts to encourage recycling, however, the current study will not focus on packaging recycling options any further.

2.2.3.3. Reusable packaging

Reusable packaging is defined as packaging that is designed to be used multiple times during its lifetime by being reused or refilled with the same intention for which it was conceived in the first place (Bradley & Corsini, 2023). However, not all reusable packaging performs better in terms of an impact on the environment than single-use packaging (Coelho et al., 2020). As per Castro et al. (2022), the reuse options may be worse off due to increased energy use during reverse logistics transportation, sorting and cleaning. Therefore, designing reusable packaging in a way

that is environmentally superior to single-use packaging is a complex and tricky task. It is estimated that around 80% of the environmental impacts of the packaging are determined in the design stage (Ahmad et al., 2018), and this impact is mostly influenced by the material selection, how the packaging is produced and how many times it has to circulate in order to 'break even'.

To be environmentally equivalent to single-use packaging, reusable packaging often has to achieve a given number of circulations before the end of its life. For example, Zimmermann and Bliklen (2020) found out that when low-density materials, e.g. Polypropylene (PP), are used to manufacture reusable packaging, they result in lower emissions per one cycle in comparison with single-use packaging. Moreover, in addition to the selected material, its weight and the way in which it is produced, the percentage of recycled content in reusable packaging can significantly decrease its negative environmental impact. According to Zimmermann and Bliklen (2020), break-even can decrease from 82 to 32 cycles if recycled content is added.

Another drawback is that reusable packaging systems are very sensitive as they depend on meeting stakeholders' demand. For instance, Tsiliyannis (2007) pointed out that when the return rate of glass bottles drops from 89.5% to 87.5%, the ability to meet demand may already be limited. Therefore, the asset shrinkage - e.g. the return rate, the loss rate, and the deterioration rate is to be reduced to the minimum possible levels. This is where end consumers come to the spotlight - even if reusable packaging is designed in a way that is less deteriorating for the environment than single-use packaging, returnable systems still depend on the end consumers and their willingness and interest to engage in such systems. However, according to Tesco PLC (2022), if reusable packaging is designed and maintained in the correct way, it is superior to recycling. Reusing requires less energy than recycling, and it does not require the continuous addition of new materials (Tesco PLC, 2022).

According to Babader et al. (2016), reusing is environmentally advantageous in a number of ways. Dubiel (1996) pointed out that reusing minimises the companies' costs for recycling, waste disposal and waste management. When designed properly, the increased utilisation of reusable packaging results in an overall reduction in the consumption of materials, which results in financial savings in materials procurement, manufacturing and disposal. Due to its perceived

benefits, its potential to reduce packaging waste and the lack of literature on the topic, the current thesis focuses on consumer perceptions of reusable packaging.

According to Bradley and Corsini (2023), there are three types of reusable packaging: (1) Primary refillable packaging, which is either refilled by consumers in stores (e.g. zero waste shops) or consumers buy pouches that they then refill to their reusable containers at home; (2) Primary returnable packaging, which is returned to the brand/retailer once empty. It is later sorted, cleaned and refilled by manufacturers; (3) Secondary/tertiary packaging, which is used in business-to-business settings. The most of the existing research on reusable packaging concentrates on secondary/tertiary packaging (Bradley & Corsini, 2023). As established earlier, this is not the focus of this study. The literature review on reusable packaging by Bradley and Corsini (2023) has analysed 107 articles, however, only nine were focused on primary refillable options and three on primary returnable packaging. This indicates that primary returnable packaging is a highly understudied topic in academia. Moreover, according to Tesco PLC (2022), when a retailer/brand is responsible for cleaning and refilling the packaging, it is more convenient for customers than a refill option. Reusable returnable packaging is a hygienic system that is not dependent on the number of people touching the same scoop or dispenser. It also prevents incorrect usage of refill stations that normally may lead to spillage and potential food waste. Hence, according to Tesco PLC (2022), reusable returnable packaging has a bigger potential to be scaled than refill options. Due to these reasons, the present thesis focuses on primary reusable returnable groceries packaging.

3. Literature Review

3.1. Process

This section is about reviewing and summarising the previous literature on the proposed topic of circularity and packaging. The authors of this thesis started the literature review by reading some articles on circularity that were kindly provided by their supervisor. These initial articles, one of them a systematic literature review on B2B packaging, led them to other sources. The authors then used the online databases LUBsearch and Google Scholar to find more literature to review. To find relevant articles, the following keywords were used: “circularity”, “consumer perceptions”, “circular packaging”, “reusable packaging”, and “returnable packaging”. The titles and abstracts of search results were screened, and the potentially relevant articles were reviewed in full. Later, the articles that were referenced in the relevant articles found via LUBsearch and Google Scholar were checked, screened and reviewed if found potentially relevant.

3.2. Consumers' interest in using reusable returnable packaging

The objective of the current thesis is to find to what extent consumers are interested in buying products in reusable returnable packaging and returning this packaging back to retailers or manufacturers and what behavioural factors are associated with their decision on whether to do so. As the authors of this thesis explored articles during the literature review, a lot of studies dealing with circular packaging were based on the Theory of Planned Behaviour. Steenis et al. (2017) suggested that research that explains consumers’ choice for sustainable packaging is often built on attitude models, most commonly on the Theory of Planned Behaviour. However, the contexts of the studies were different. For example, Lee (2022) used the Theory of Planned Behaviour to explore whether news consumptions influence the use of circular packaging in online shopping in Taiwan. Due to its popularity and relevance for the current thesis, the Theory of Planned Behaviour will also frame this research. By exploring attitudes, subjective norms and perceived behavioural control of consumers, the authors aim to understand and assess the interest of consumers in using and returning such packaging and find the strength of associations between behavioural factors and interest.

The Theory of Planned Behaviour (TPB) is an extension of the Theory of Reasoned Action (TRA), and it is regarded as one of the most effective socio-psychological theories in understanding, explaining and predicting human behaviour (Oztekin et al., 2017). The theory proposes that human behaviour depends on the intention to perform the behaviour. The intention, in turn, is predominantly determined by three conceptually independent antecedents - attitudes towards the behaviour, subjective norms and perceived behavioural control (Ajzen, 1991).

Attitudes towards the behaviour mean how the person that is going to perform the behaviour evaluates the behaviour and whether the person sees it as good or bad. According to Escario, Rodriguez-Sanchez and Casaló (2020), environmental attitudes are believed to be linked to reuse behaviours. However, according to Babader et al. (2016), the TPB is only concentrated on the attitudes towards that concrete behaviour and not the general attitudes. The subjective norms refer to the pressure from society that the person feels to perform the behaviour based on a belief of what others expect of the individual. Perceived behavioural control indicates how capable the person finds themselves to perform the behaviour and whether they think that they are in control/charge of the behaviour, in other words, whether the intention to perform the behaviour is up to them (Ajzen, 1991).

According to the TPB, these three factors can predict a person's intention to perform a certain behaviour, which subsequently predicts their actual behaviour. The theory has been applied in a wide range of contexts to study behaviours in all kinds of different areas - ranging from environmental, health and customer behaviours (Ajzen, 1991). In general, the findings from previous studies provide evidence that attitudinal factors, normative factors and perceived behavioural control have predictive power for the behavioural intention and the actual behaviour (Ajzen, 1991).

This thesis will examine the interest of consumers in using reusable returnable packaging. The authors will not be able to observe whether the behavioural intention leads to the actual behaviour as the system for reusable returnable packaging is not widely available, and therefore there is no basis for such observation. However, the meta-analysis of 185 studies by Armitage and Conner (2001) found that the TPB accounted for 27% of the variance in behaviour and 39% of the variance in intention. Thus, intentions are reliable predictors of behaviour.

Based on the Theory of Planned Behaviour, the authors have formed the following hypotheses:

H1: Positive attitudes towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging.

H2: Positive subjective norms towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging.

H3: Positive perceived behavioural control towards using reusable returnable packaging is positively associated with the interest in using reusable returnable packaging.

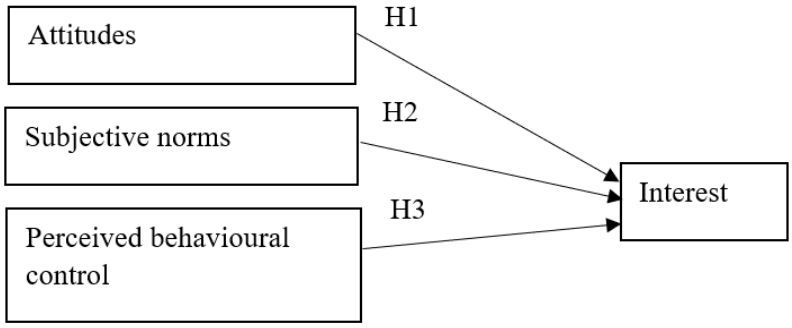

Figure 1 - Hypotheses set 1

3.3. Consumer segments and the interest in using reusable returnable packaging

Consumer segmentation consists of dividing consumers into different groups of individuals based on specific similar characteristics. In order to find which consumer segments would be the best to target for early implementation of reusable returnable packaging, shall the companies be interested to do so, the authors of this thesis have decided to explore the association of a few demographic factors, namely age, gender, and education level, with the interest in using reusable returnable packaging. These factors were chosen because their impact on consumer behaviour as well as recycling and other environmental initiatives in the reviewed studies and articles was mentioned a number of times (Martinho et al., 2015; Miafodzyeva & Brandt, 2013; Nixon & Saphores, 2009; Northen et al., 2023; Jaderna & Volfova, 2020; Deliana & Rum, 2019).

Due to the fact that deposit systems for packaging, mostly for PET bottles and aluminium cans that are collected for recycling, are relatively widespread, the authors have decided to examine whether previous experience with returning packaging (e.g. as part of the deposit systems for

bottles and cans) is associated with interest in using reusable returnable packaging. Hence, the factor of previous experience is also included in the current study.

3.3.1. Age

The research on age and its impact on environmental concerns is contradictory. Some researchers argue that young people are more likely to care about their purchase behaviour's impact on the planet, while others argue that older people act in a more environmentally-friendly way (Gifford & Nilsson, 2014).

For instance, on the one hand, a case study was conducted about consumers' perception and behaviour towards Single Use Plastic Products (SUPPs) in Portsmouth, UK (Northen et al., 2023). The study found that individuals aged 50 and over cared more about where their waste ends up, purchased less single-use plastics and reused bags more often than their younger counterparts (Northen et al., 2023). They were also more willing to make efforts to take sustainability and ease of recycling into account in their purchase decisions, while the younger generation said that recycling is too inconvenient (Northen et al., 2023).

Another study was conducted on 2487 Spanish residents over 17 years old on how environmental attitudes and perceived effectiveness affect a person's reported waste-related behaviour. Contrary to most studies that focus on only one of the 3Rs (reduce = purchasing minimally packaged goods, reuse = purchasing goods with reusable packaging and recycle= sorting recyclable materials), this study examined the 3Rs together (Escario, Rodriguez-Sanchez & Casaló, 2020). The results showed that people aged between 54.1 and 59.6 are the most likely to use reusable packaging, and people aged between 81.2 and 90.2 years old are the most likely to sort paper and plastic (Escario, Rodriguez-Sanchez & Casaló, 2020). Thus, 3R behaviours (reducing, reusing and recycling) are more prevalent in the older generation.

Another study by Chirilli, Molino and Torri (2022) also showed that older people are more concerned about the environmental impact of packaging components and are also more willing to pay extra to minimise it. Saphores and Nixon (2009) concluded as well that people aged between 18 and 29 years are less likely to recycle than people aged between 45 and 59 years, and that the presence of someone aged over 65 years old in the household positively impacts the

recycling rate. Another study conducted by Vining and Ebreo (1990) on the different characteristics of people who recycle and people who do not also highlighted that older people recycle more.

On the other hand, some studies argue that younger people are significantly more aware of the need to preserve the environment for the future, more ecologically educated, and more interested in environmental issues than older people (Jaderna & Volfova, 2020). Another study by Deliana and Rum (2019, p.361) has found that "young generations have higher levels of green behaviours, that is, they are characterised as being highly adaptive to their choices on environmentally friendly products."

Currently, researchers do not provide any explanation to why older generations are more or less likely to pay more attention to sustainability in their purchase habits. Therefore, more research is needed to fill this gap in the literature.

Even though there is mixed evidence, most of the research seems to agree that older people are more likely to behave in an environmentally friendly way. Hence, the current research sets the following hypothesis:

H4: Age is positively associated with the interest in using reusable packaging.

3.3.2. Education level

Rasmussen (1984) did a study of New Yorkers after the so-called bottle bill was passed in the 80s but before it was implemented. Bottle-bill required all soft-drinks containers to carry at least 5 cents deposit. This policy was estimated to increase the price of a case of soft drinks and beer from 50 cents to 60 cents, which is a 20% increase. This was due to the storekeeper's handling and transport of the empty containers to collection points. One of the questions in Rasmussen's (1984, p.37) survey was the following: "In other states which have five-cent deposits on bottles and cans, less litter is found in parks and along roads because the containers are returned to the store. Because the storekeeper must handle and transport the empties, the price of soda or beer goes up a little. In addition to the five-cent deposit, would you be willing to pay an extra ten cents per six-pack of soda or beer to reduce litter or not willing to pay an extra ten cents per six-pack of soda or beer?" The survey resulted in 75% of respondents being willing to pay ten

cents more and hence engaging in such a returnable system. Higher-income and higher-education respondents were more willing to answer that they would pay 10 cents more. Rasmussen explained this by them valuing marginal improvements in environmental quality more.

The study by Miao, Magnier and Mugge (2023) provided a comprehensive understanding of consumers' perceptions towards reusable packaging systems (RPSs). However, in contrast to the current thesis that focuses on reusable returnable packaging, they focused on refillable options and explored consumers' attitudes and concerns connected to such systems. They found that reactions towards the refilling stations were predominantly positive, which shows that consumers' acceptance of such systems at scale is promising. However, as a limitation of the study, the authors pointed out that it was done solely on Dutch consumers who have a high level of education and environmental awareness. This, once again, implies that participants with a higher level of education are more likely to engage in RPSs.

Therefore, the hypothesis for the current study is the following:

H5: Education is positively associated with the interest in using reusable returnable packaging.

3.3.3. Gender

The research conducted on the impact of gender on the interest in reusing packaging and concern about the environment has been inconsistent. Some researchers argue that women are more sensitive about environmental issues (Martinho et al., 2015; Johnson, Bowker & Cordell, 2004; Schultz, Oskamp & Mainieri, 1995; Stern et al., 1995), and others argue that gender does not have a significant impact (Do Valle et al., 2004; Domina & Koch, 2002; Gamba & Oskamp, 1994; Saphores & Nixon, 2014).

On the one hand, Johnson, Bowker and Cordell (2004) showed that women generally score higher on the New Ecological Paradigm, which is a metric used to measure environmental concern (Anderson, 2012). Zelezny, Chua and Aldrich (2000) examined 9 studies and discovered that 6 of them showed that women have higher environmental concerns than men. Another study conducted in Spain on the impact of environmental attitudes on recycling, reducing and reusing packaging by Escario, Rodriguez-Sanchez, and Casaló (2020) found that women are more likely

than men to purchase goods in reusable packaging. They argue that this is due to the fact that women are in general still the ones responsible for going grocery shopping most of the time, and are more used to it. Therefore, women might be more concerned about buying eco-friendly products. Another study on green consumerism drivers also concluded that the motivations behind customers' green purchase intentions are higher among women than among men (Chekima et al., 2015). This may be due to differences in socialisation, personality traits and roles. Indeed, women are taught to have more empathy, a higher sense of ethics and a higher sense of responsibility towards others (Casaló & Escario, 2016; Zelezny, Chua & Aldrich, 2000). Therefore, they tend to act in a more ecologically friendly way (Arnocky and Stroink, 2011).

On the other hand, several studies have concluded that gender is not a significant variable (Miafodzyeva & Brandt, 2013; Saphores & Nixon, 2014). The case study about consumers' perception and behaviour towards Single Use Plastic Products (SUPPs) that was conducted in Portsmouth also showed that gender only impacted awareness of zero waste stores (Northen et al., 2023). Chen and Chai (2010) conducted a study on the attitudes towards the environment and green products from a consumer perspective and also concluded that there is no difference between men and women when it comes to environmental attitudes.

Since there is more evidence supporting the idea that women are more environmentally conscious than men than the evidence supporting the idea that there is no association between gender and environmental concern, the authors decided to set the following hypothesis:

H6: Gender (female) is positively associated with the interest in using reusable returnable packaging.

3.3.4. Past experience

In numerous places in the world, deposit schemes for some types of packaging exist. The collected packaging is later recycled and not reused. Most of the time, these schemes are dedicated to PET bottles and aluminium cans for beverages. Such systems ask consumers that buy beverages in PET bottles or cans to return the packaging at collection points in order to get their deposit back. The packaging is then sorted, cleaned and recycled. In 2020, 40 countries had deposit systems for bottles (McCarthy, 2020). In Europe, Sweden was the first to launch a

Deposit Return System (DRS) in 1984 (TOMRA, 2022), and currently, over 85% of PET bottles and cans are returned (Zero Waste Scotland, 2021). Consumers pay a deposit of 1 SEK for cans and small PET bottles and 2 SEK for big PET bottles (Pantamera, n.d.). The deposited packaging is then recycled into plastic or aluminium that is suitable for use in food. Germany has also used a similar system since 2003, where consumers pay a deposit of 25 cents for plastic bottles (McCarthy, 2020).

This system has been widely successful and led to a recycling rate of about 90% in the countries that implemented it (Recykal, n.d.). Additionally, it has also helped to reduce littering, as now people have a financial incentive to dispose of their empty bottles correctly instead of littering. Moreover, it makes consumers more aware of the impact of their consumption habits on the planet. Indeed, having to take the time to return bottles and cans can encourage them to be more mindful of their consumption (AcoRecycling, 2023). Additionally, studies have demonstrated that only a 15 cents deposit would be good enough to motivate consumers to return their bottles (Rear, 2018).

Additionally, in some countries around the world, certain types of packaging are being collected from consumers, not with the intention of recycling them but reusing them. The packaging is returned by end consumers, washed, sent back to producers and reused. This system is most commonly working with glass bottles. For example, since 2003, in Slovakia, certain glass bottles are part of the deposit system and can be returned in the wide network of grocery stores (Bottle Bill Resource Guide, 2022). These are then cleaned, refilled by producers and reused.

Moreover, some companies have already taken the step to offer reusable returnable packaging to consumers for products reaching beyond beverages. For example, the company Loop offers a wide range of products in reusable packaging, collaborating with major brands and retailers, such as Unilever, Tesco, Coca-Cola, etc. (Loop, n.d.). Loop collects empty packaging from consumers and cleans them before returning them to manufacturers. Glass and stainless steel, two durable materials, are used to make the packaging. They are currently present in the United Kingdom, the United States, Canada, France and Japan (Loop, n.d.).

Due to the fact that similar systems to what authors aim to observe in this thesis currently work around the world, the option of extending the Theory of Planned Behaviour and adding past or

current experience with returning packaging as the factor that predicts behavioural intention was explored. In fact, the literature review provided a couple of studies and articles that considered the exclusion of past behaviour from the theory as its weakness (e.g. Perugini & Bagozzi, 2001). Ajzen (1991, p.199), who developed the TPB, stated that: "The theory of planned behaviour is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behaviour after the current variables of the theory have been taken into account." However, he did not see specifically the past behaviour as the causal factor in its own right (Ajzen, 1991, p.203). Therefore, for this thesis, the authors decided to explore past experience and its possible association with the interest in using reusable returnable packaging to see whether this factor could be included in the theory.

The following hypothesis was formed:

H7: Previous experience with returning packaging is positively associated with the interest in using reusable returnable packaging.

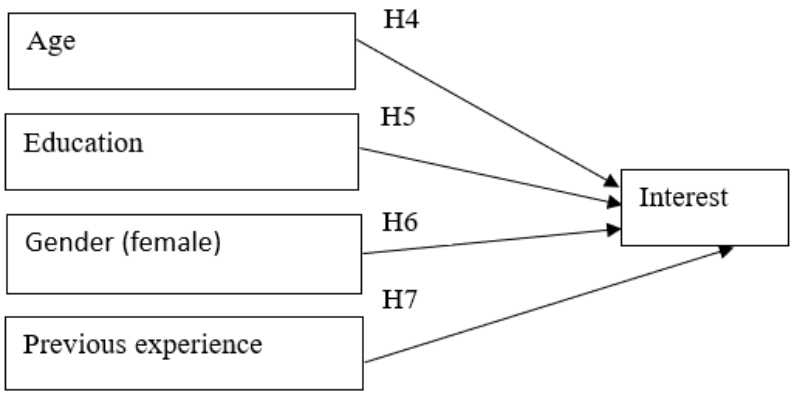

Figure 2 - Hypotheses set 2

4. Methodology

The following section explains how the current research is conducted and why it is done in such a way. During the duration of the thesis, the authors of the study attended two conferences in Malmö, Sweden, organised by Packbridge AB, which is a cluster that connects the packaging ecosystem in Skåne, Sweden (Packbridge AB, n.d.). These conferences provided the authors with valuable knowledge connected to the packaging industry. The authors also managed to have informal conversations with representatives of the biggest actors in the packaging industry in Skåne, and such insights helped them to shape the research questions and develop the methodology for this thesis.

For example, before joining the first conference, the authors aimed to focus on circular packaging from the companies' perspective rather than consumers; however, packaging industry leaders expressed an interest in seeing the consumers' perspective. Moreover, the conference included input from Loop company that successfully piloted reusable returnable packaging in certain stores in Tesco UK mentioned before, which narrowed down the authors' focus from circular packaging as a whole to reusable packaging in particular. The subsequent literature review provided further indications that consumers' perceptions and reusable packaging are understudied areas. The following section of the thesis starts with an explanation of philosophical assumptions that guide the study, continues with the method and considerations that were taken into account during the survey creation and data collection procedure and concludes with the data analysis.

4.1. Positivist epistemological considerations

This paper draws from the positivist epistemological position. Positivism holds that “because reality exists objectively and externally, the appropriate way to gather data is to observe phenomena directly or to measure them using surveys and other instruments” (Bell, Bryman & Harley, 2019, p.30). In the positivist approach, the role of research is to develop testable hypotheses that will enable explanations of laws to be evaluated, which is also known as the principle of deductivism (Bell, Bryman & Harley, 2019). It also states that “science must (and presumably can) be conducted in a way that is value-free” (Bell, Bryman & Harley, 2019, p.30).

Indeed, this paper aims to test hypotheses on consumers' interest in using returnable reusable packaging based on the Theory of Planned Behaviour, which is in line with positivism.

4.2. Deductive logic

The logic behind this study is deductive. The current research was driven by the knowledge already known about the topic of packaging and its reusability. Through the theoretical considerations within the topic, the authors deduce hypotheses that consequently have to be empirically tested. Such logic counts with hypotheses being tested and later rejected or not rejected via data collection. The last step of the deduction is a revision of the theory.

The opposite of deductive logic is inductive logic, where the theory is developed through observations (Bell, Bryman & Harley, 2019). Hence, while the research driven by deductive logic starts with the theory and draws hypotheses, the study guided by inductive logic observes the concepts with the goal of developing a theory (Bell, Bryman & Harley, 2019).

At the very beginning of the current study, the authors designed the research to be inductive and exploratory as there was a belief that there is no literature, findings and theories to deduce hypotheses from. However, during the process of a literature review, the authors found that even though the topic of consumers' perceptions of reusable returnable packaging is understudied, there was enough knowledge and theories to build the hypotheses. A couple of previous studies explored during the literature review used the Theory of Planned Behaviour (eg. Lee, 2022) as a starting point, and hence authors of the thesis rethought the research logic.

To assess consumers' interest in reusable returnable packaging and answer stated research questions, deduction was ultimately chosen as a preferable logic in guiding the current study. This change allows authors to test hypotheses derived from previous research on a large scale via a survey.

4.3. Cross-sectional research design

The research design “provides a framework for collection and analysis of data” (Bell, Bryman & Harley, 2019, p.45). The research method is: “a technique for collecting data” (Bell, Bryman & Harley, 2019, p.45). There are various research designs and methods that researchers can choose

based on the objectives and goals of their research. As the objective of this thesis is to find the extent to which consumers are interested in using reusable returnable packaging, results have to be drawn from more than one case (more than one consumer) as the variation in respect of consumers is what the authors of this thesis are interested in (Bell, Bryman & Harley, 2019). Moreover, the authors of this thesis are curious about the extent to which consumers are interested in reusable returnable packaging currently, at this one single point in time. Therefore, a cross-sectional research design, which is characterised by more than one case and a single point in time, was chosen as a suitable design to reach the objectives of the thesis. Cross-sectional research design "comprises the collection of data in the form of observations on a series of variables at a single point in time" (Bell, Bryman & Harley, 2019, p.61). Such research design is often called the social survey method, as the method of collecting data is often via surveys and questionnaires.

However, the cross-sectional research design is not without limitations. The con of such a design is that it only allows for the examination of relationships between variables. As the variables are not time-ordered because they are all collected at the same time, the establishment of the direction of causal relationships is problematic (Bell, Bryman & Harley, 2019). Once the relationship between two variables is found, one cannot be sure that the relationship is causal. It is possible to draw some causal inferences with such research design; however, such findings are rarely on the same level of credibility as when, e.g. experimental research design is implemented (Bell, Bryman & Harley, 2019). As a result, the internal validity of such research design is typically weak. Cross-sectional research design, therefore, uncovers associations and not causations (Bell, Bryman & Harley, 2019). Hence, the findings of the current research will focus on associations between variables but will not establish any causal relationships.

4.4. Survey method

The survey method of data collection was chosen as appropriate for the objectives of this thesis. For the full survey used in this thesis see Appendix A. When compared to interviews, surveys have advantages as well as disadvantages. These were thoroughly considered before choosing the method that would be the most suitable to answer the research questions and reach the objectives of the thesis.

The advantages that surveys have over structured interviews are, for example, that they are completed without the presence of an interviewer; hence they are self-completed (Bell, Bryman & Harley, 2019). As the interviewer is not present, surveys have a lower probability of leading to social desirability bias, especially when anonymity is ensured (Bell, Bryman & Harley, 2019). Self-completion questionnaires are cheaper and easier to administer, especially when done online. Online self-completion surveys can reach a much greater population, even geographically dispersed, than structured interviews can (Bell, Bryman & Harley, 2019). Surveys are also convenient for respondents as they can fill them out in their free time anytime they wish, whereas interviews have to be carefully planned and scheduled beforehand.

On the other hand, surveys also have a number of disadvantages when compared to structured interviews. The authors have taken these into account and tried to mitigate them during the survey creation process for this thesis.

One of the disadvantages of a self-completion survey is that there is no one that can prompt respondents and help them in case they do not understand the question (Bell, Bryman & Harley, 2019). It is, therefore, important to ask questions that are understandable and that are unambiguous in surveys. The authors conducted a pilot test on five individuals from different backgrounds, aged from 25 to 64, from high school education to doctorate degree, with a balanced gender representation to answer the survey questions before the survey was administered on a scale. The input from the pilot test helped the authors to see whether the questions were understandable. As a result, some questions were rephrased; hence the face validity improved, and the disadvantage of no interviewer being present was mitigated. However, it cannot be entirely ruled out that respondents understood the questions in a different way.

Another disadvantage pointed out by Bell, Bryman and Harley (2019) is that questionnaires can be read as a whole, and therefore, the questions are not truly independent of each other, and respondents may answer them in a different order than the one that was intended by the authors. The authors of this thesis have taken this issue into account and separated the online questionnaire into two independent sections; respondents were not able to see *Section 2* without first completing *Section 1*. Hence, the authors mitigated the impact of this disadvantage of surveys during the questionnaire creation process.

An additional disadvantage of a self-completion questionnaire is that it is difficult to ask a lot of questions due to respondents' fatigue. According to Bell, Bryman and Harley (2019), long surveys are feasible only very rarely, and the propensity to answer shorter surveys is higher. Moreover, the objective of this thesis is to maximise the number of responses and gather input from as many respondents as possible. Therefore, the authors of the survey decided to keep the questionnaire short and included twelve questions. The information about the number of questions as well as the indication of how much time the survey would take (at most 5 minutes), was mentioned in the survey instructions provided to the respondents before starting the survey. Hence, the authors recognise that the scope of the questions is limited.

While interviewing, it is harder for the individual to skip the question or simply not provide an answer to a question. However, skipping questions is a common practice for surveys. Collected surveys often miss data, as respondents left out the question that they, for various reasons, did not want to answer. This is identified by Bell, Bryman and Harley (2019) as another shortcoming of the survey method. However, during the creation of the survey for this thesis, authors enabled the functionality of required questions, and hence, the survey could not be submitted without all questions being answered. Thus, this limitation of surveys was completely eliminated.

The last disadvantage of surveys identified by Bell, Bryman and Harley (2019) is that surveys may not be appropriate for certain kinds of respondents. For example, surveys are not an appropriate measure for respondents that have literacy problems or have difficulties understanding the language in which the survey is conducted (Bell, Bryman & Harley, 2019). The survey created by the authors is in English; therefore, the authors recognise the limitation this possesses - only respondents that are able to speak English can answer the survey. The survey for this thesis was created via Google Forms. During the pilot study, the authors realised that the person that was 64 years old had trouble opening the survey as sign-in to the Google account was requested. The respondent did not have a Google account. However, as the thesis does not only aim to explore the extent of interest in reusable returnable packaging of young generations but older ones as well, the input from the older generation is crucial to test the hypotheses proposed in this thesis, especially *H4*. As the older generation is less technologically proficient, authors have realised that reaching the older generation via an online survey may be problematic. This issue was mitigated by removing the obligation to sign in to the Google

account before filling out the survey. Therefore, the survey could be completed by anybody with a computer or smartphone and an internet connection without requiring them to register or create an account.

According to data from Eurostat (2021), 88% of people aged 16-74 years used the Internet at least once in the last three months. Whereas 98% of people aged between 16 and 24 use the Internet regularly; however, only 61% of those aged between 65 and 74 use it. Therefore, the authors realise that reaching this age group may be harder via online surveys. Nevertheless, due to the limited time frame in which this thesis was produced, an online survey was chosen as the method for data collection while taking this limitation into consideration. An online survey is a tool that allows the authors of this thesis to reach the greatest population in the shortest time, which aligns with the objectives and goals of this thesis.

4.4.1. Operalization and survey creation

The hypotheses presented in the literature review section had to be tested through the method chosen by the authors as the most appropriate one to achieve the objectives of the thesis and answer the research questions - online survey (see Appendix A). The authors have deduced two sets of hypotheses. For each hypothesis, null-hypothesis will also be tested. In hypothesis testing, the null hypothesis is a statement that there is no significant relationship between two or more variables, while the alternative hypothesis is a statement that there is a significant difference or relationship between the variables (Bell, Bryman & Harley, 2019).

The first set of hypotheses is connected to consumers' interest in using reusable returnable packaging and is guided by the Theory of Planned Behaviour (H1, H2, H3 and $H_0$1, $H_0$2, $H_0$3). The second set focuses on consumer segments and the interest in using reusable returnable packaging (H4, H5, H6, H7 and $H_0$4, $H_0$5, $H_0$6, $H_0$7).

The survey (see Appendix A) is divided into two sections, corresponding to the two sets of hypotheses, and it includes twelve closed questions. The option to include more questions was explored; however, as the objective of the survey and thesis is to maximise the number of responses, the authors decided to minimise the number of questions.

Furthermore, the dilemma of whether to ask questions in an open or closed format arose during the process of survey design. Open-ended questions have advantages such as allowing for unusual responses, letting respondents express their ideas in their own words, and such questions do not suggest any answers (Bell, Bryman & Harley, 2019). Open-ended questions are useful when a new area is being explored (Bell, Bryman & Harley, 2019). However, answers to such questions must be coded after collection, which is more time-consuming for researchers, and they require greater effort to fill out from the respondents. On the other hand, closed questions are easy to process as they are pre-coded, they enhance the comparability of the answers, and they are easy to answer for the respondents (Bell, Bryman & Harley, 2019). As the objective of the thesis is to gather as many responses as possible to test the hypotheses, the authors have decided to only use closed questions.

The closed questions were designed with the general consideration of dos and don'ts for creating survey questions identified by Bell, Bryman and Harley (2019). The authors avoided using ambiguous or overly technical terms, double-barrelled questions, leading questions or questions including negatives and made the questions short.

The first section of the survey is focused on the demographic factors and past experience with returning packaging, and hence the set of hypotheses concerned with consumer segments. The section consists of four questions that ask the respondents to provide personal information; thus, they are personal factual questions (Bell, Bryman & Harley, 2019).

The question about the variable - *age* (Q1) - is a multiple-choice question and provides six different ranges of age from which respondents can choose. The authors explored the option of asking for age in the form of an open question, where respondents would type their age as a numerical value. This would lead to more precise data collection. However, during the pilot test of the survey, it was pointed out that it was more time-consuming and felt too personal to share the age. The authors were also worried that some respondents would not insert a number but would write their age either in words or would skip the question by typing something unrelated to the allocated text field. Hence, the option to provide a range of categories to choose from was chosen as more viable. The age categories used for the survey are standard and were adopted from (Kirklees Council, n.d.). As the age is grouped to different categories, the variables that are

generated by this question are ordinal. Ordinal variables are "variables whose categories can be rank ordered but where the distances between the categories are not equal across the range" (Bell, Bryman & Harley, 2019, p.317). The age is collected so that possible association between age and interest in using reusable returnable packaging can be observed and analysed. This data is used to either reject or not reject the H4 and $H_0$4.

The question about the variable - *level of education* (Q3) - includes six options. The options were created by the authors of this thesis. The standard ways of asking a question about education are often country-based and very country specific. As education systems across countries vary significantly, an option to include general terms and levels of education that would be understandable by respondents across different socio-cultural backgrounds was explored. As the authors come from different backgrounds and studied in various countries, they agreed on six categories that are believed to exist across various cultural spectrums - No diploma, High school diploma (equivalent to A levels), Professional/vocational diploma, Bachelor's degree, Master's degree, and Doctorate degree. The variables this question generates are also ordinal, meaning that they can be rank ordered. The data about education is collected to reject or not reject the hypothesis about education being associated with the interest in using reusable returnable packaging (H5 and $H_0$5). However, using formal education as a measure of the level of education has its cons. The authors are aware of the shortcomings of this measure, as one can be highly educated without having completed a high level of formal education. Non-formal education and other types of education are not collected nor included in this thesis.

The question about the variable - *gender* (Q2) - includes four options - male, female, other, and prefer not to say. The options were chosen with the ethical considerations of diversity and inclusion of members from the LGBTQ+ community, allowing for self-identification. The type of variables that will be generated by this question in the course of the study is nominal. Nominal variables are "variables whose categories cannot be rank ordered; also known as categorical" (Bell, Bryman & Harley, 2019, p.317). This data is collected with the purpose of analysing consumer segments based on gender in order to reject or not reject the possible association between gender and interest in using reusable returnable packaging (H6 and $H_0$6).

The question about the variable - *past experience* (Q4) - generates dichotomous variables that are "variables containing data that have two categories" (Bell, Bryman & Harley, 2019, p.317). The

question only has two options - yes and no. It is collected to reject or not reject the hypothesis about past experience and its association with an interest in using reusable returnable packaging (H7 and $H_0$7).

The second section of the survey deals with attitudes, subjective norms and perceived behavioural control. The section starts with an explanation of what reusable returnable packaging is. It includes the following text for respondents to imagine the shopping experience with reusable returnable packaging: "Imagine you go to the supermarket and you purchase jam in a glass jar, ice cream in a steel container and oats in a plastic container. You then consume the products, and once the packaging is empty, you bring it back to the collection point, which can be located at the retailers or producers' premises." This short text was added based on the pilot testing of the survey, where one respondent pointed out that they were not sure how the shopping experience with reusable packaging would work and which products/materials would be included; therefore, they had trouble answering the questions.

The questions/statements in this section were partially taken from and adapted from the sample questionnaire developed by Icek Ajzen, the developer of Theory of Planned Behaviour (Ajzen, 2006). This allowed the authors to use questions/statements that have already been pre-tested and their validity and reliability has been measured before.

In the survey adapted for this thesis, the variables - *attitudes, subjective norms and perceived behavioural control* - are measured by multiple first-person statements; more precisely, attitudes are measured by three statements (Q5, Q6, Q7), subjective norms by two statements (Q8 and Q9) and perceived behavioural control by two statements (Q10 and Q11). This reduces the measurement error, hence increasing the reliability and predictive validity of the study.

The variable - *interest* - is measured by one statement (Q12). The authors explored the option to include more statements; however, due to potential difficulties with analysing the survey outcomes if multiple statements yielded very different results, the authors have decided to include only one clear statement about respondents' interest in using reusable returnable packaging.

A five-point Likert scale is used for the measurement of all the statements, with 1 meaning *strongly disagree* and 5 *strongly agree*. Such a method is also recommended by Ajzen (2006). The meaning of each number was explained to respondents in the accompanying text of the survey in the following way - 1 - Strongly Disagree, 2 - Disagree, 3 - Neither Agree Nor Disagree, 4- Agree and 5- Strongly Agree. The variables that are generated by these questions are ordinal, as they are rank-ordered via the Likert scale. The intention behind measuring the statements is to uncover possible associations between attitudes (H1 and $H_0$1), subjective norms (H2 and $H_0$2), perceived behavioural control (H3 and $H_0$3) and the interest in using reusable returnable packaging.

The hypotheses, corresponding survey questions, provided options as well as types of variables generated in the course of the study are summed up in the table below. *Table 1* also includes the type of analysis that will be used to reject or not reject the hypotheses, the reasons for this choice are explained in section *4.9 Data analysis.*

Hypothesis	**Questions**	**Options**	**Type of variables generated in the course of the research / Scale**	**Analysis**
H1: Positive attitudes towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging.	5 6 7	Likert scale from 1 (strongly disagree) to 5 (strongly agree)	Ordinal	Spearman's rho
H2: Positive subjective norms towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging.	8 9	Likert scale from 1 (strongly disagree) to 5 (strongly agree)	Ordinal	Spearman's rho

H3: Positive perceived behavioural control towards using reusable returnable packaging is positively associated with the interest in using reusable returnable packaging.	10 11	Likert scale from 1 (strongly disagree) to 5 (strongly agree)	Ordinal	Spearman's rho
H4: Age is positively associated with the interest in using reusable packaging.	1	18-24 25-34 35-44 45-64 65 and over	Ordinal	Spearman's rho
H5: Education is positively associated with the interest in using reusable returnable packaging.	3	No diploma High school diploma (equivalent to A levels) Professional/vocational diploma Bachelor's degree Master's degree Doctorate degree	Ordinal (because formal education can be viewed as a scale)	Spearman's rho
H6: Gender (female) is positively associated with the interest in using reusable returnable packaging.	2	Female Male Other Prefer not to say	Nominal	Cramér's V and Chi-square
H7: Previous experience with returning packaging is positively associated with the interest in using reusable returnable packaging.	4	Yes No	Dichotomous	Cramér's V and Chi-square

Table 1 - Summary of the survey options and corresponding hypotheses

4.5. Data collection - Convenience sample

The authors of this thesis have chosen to create a survey via Google Forms. This platform was chosen due to it being the common and traditional tool for survey creation, which is trusted by the general public (Vasantha Raju & Harinarayana, 2016). The survey was shared on authors' personal social media platforms such as LinkedIn, Facebook, WhatsApp, and Instagram, and also

directly through private text messages. The authors aimed to receive at least a hundred responses in order for the sample to be analysable. In the end, 302 responses were collected.

The authors decided to have a convenience sample approach. It consists of sharing the survey with the researcher's own social network (Bell, Bryman & Harley, 2019). This approach was chosen mainly to ensure a high number of responses, as it is crucial in order to guarantee a high level of precision. Bell, Bryman & Harley (2019, p.195) indeed state that "increasing the size of a sample increases the likely precision of a sample." The authors are aware of the downfall associated with this approach, such as the limited representativity of the sample, as there is no way to ensure diversity in respondents. Indeed, when most of the respondents are part of the researchers' networks, they generally are relatively homogenous and share a significant number of characteristics. However, the authors did their best to ensure diversity in age, education and gender by sharing the survey with various acquaintances. Additionally, the authors come from different countries, namely Switzerland and Slovakia, which also helps to ensure some diversity.

In addition, there were also time and resource constraints that made the convenience sample the best option. Indeed, this paper had to be written in two months, and the authors did not have access to any database from which a more representative sample could be randomly selected and reached out to. The authors are aware that a more representative sample, which "represents the population accurately so that it is a microcosm of the population" (Bell, Bryman & Harley, 2019, p.188), would have been a better representation of the reality, but, due to the aforementioned time and resources constraints, it was not feasible, and the convenience sample was, hence, chosen.

Moreover, if the authors decided to use other data collection methods, such as focus groups or in-depth interviews, they would have likely faced the same kind of representativeness issues, as the people who would have agreed to participate would have likely been connected to the authors in some ways.

Since the survey was shared on various social media platforms and also reshared by the authors' network, it was not possible to know how many people it reached and, therefore, to calculate the response rate, which is concerned with the percentage of people who agree to participate (Bell, Bryman & Harley, 2019).

4.6. Mixed strategy

The research strategy of this paper is of mixed nature. Indeed, the majority of the collected data is ordinal, which can be seen as an inbetween of qualitative and quantitative data (Bell, Bryman & Harley, 2019). Additionally, most of the data collected in the survey is qualitative, because they consist of words and not of numbers. However, the data is analysed via statistical methods by using non-parametric correlations and descriptive analysis. In addition, this research aims to understand the perception of the general public towards reusable returnable packaging, therefore it is necessary to have as many answers as possible in order to have data that can be applied to larger populations. Thus, a survey filled by as many participants as possible is a more appropriate research approach than in-depth interviews or focus groups. The aim of the research is also to test hypotheses on consumers' interest in reusable returnable packaging, which is characteristic of quantitative research (Bell, Bryman & Harley, 2019). Indeed, quantitative research is more concerned with the testing of theories whereas qualitative research is more concerned with generating theories on phenomena that are not yet well-studied (Bell, Bryman & Harley, 2019). Since there was already some literature on circularity in the packaging industry, it was possible to build hypotheses and research of qualitative nature was, therefore, not needed. Hence, the strategy for this study resembles quantitative, with qualitative non-parametric data being collected and pre-coded to numerical values, which allows this data to be analysed by statistical methods.

4.7. Validity and reliability

The measures that are commonly used for the evaluation of business research are reliability and validity. The following section deals with the explanation of what these are and what measures the authors of this paper made to maximise the reliability and validity of the current research.

4.7.1. Validity

Validity is often regarded as the most crucial measure (Bell, Bryman & Harley, 2019). It is concerned with "whether or not a measure of a concept really measures that concept" (Bell, Bryman & Harley, 2019, p.174). There are several types of validity, such as measurement

validity, internal validity, external validity, ecological validity and face validity which will be further discussed in the following section.

Measurement validity, often called construct validity, is concerned with “whether a measure captures the phenomenon which it intends to capture” (Bell, Bryman & Harley, 2019, p.46). When assessing the measurement validity, the relevant questions include: Do the chosen measures represent the concepts that they intend to? To be certain of the validity of their measures, the authors of this paper decided to base their hypotheses on the Theory of Planned Behaviour, which is a well-known and recognised theory in academia. Moreover, questions/statements in the questionnaire were partially taken from and adapted from the sample questionnaire developed by Ajzen (2006), the author of the Theory of Planned Behaviour. Hence, their measurement validity was tested and confirmed before.

Internal validity is closely related to the issue of causality. It is concerned with “understanding whether a conclusion that incorporates a causal relationship between two or more variables holds” (Bell, Bryman & Harley, 2019, p.47). Internal validity questions whether the causal relationship suggested by the study is indeed caused by the factor in question or whether something else influences it. The factors that are believed to have a causal impact are often referred to as independent variables (Bell, Bryman & Harley, 2019). In contrast, the variable that is affected is often referred to as a dependent variable. As established earlier, internal validity in cross-sectional research design is often weak as the direction of causal relationships is difficult to establish. Nevertheless, the cross-sectional nature of the research was chosen for the reasons mentioned earlier.

When forming the first set of hypotheses, the Theory of Planned Behaviour, which claims that attitudes, subjective norms and perceived behavioural control are the predictors of behavioural intention, was chosen as a framework. Therefore, the direction of the causal relationship was established and tested before. However, the authors are aware that the current study, due to its design, cannot confidently claim this causal direction. Therefore, the current research only aims to find the association between variables and infer causality based on the established theory rather than confidently claim that one variable causes the other.

For the second set of hypotheses concerned with age, gender, education, past experience and their association with the interest in using reusable returnable packaging - it seems logical that age, gender, education and past experience came earlier in time than the interest in using reusable returnable packaging. For example, suppose the relationship between age and interest in using reusable returnable packaging is found. In that case, it is quite impossible that age is influenced and changed by the interest in using reusable returnable packaging. Hence, even though the authors will not be able to claim that age is truly an independent variable that confidently influences the interest in using reusable returnable packaging, they will be able to claim that age being an independent variable is highly plausible.

External validity is concerned with "whether the results of a study can be generalised beyond the specific research context" (Bell, Bryman & Harley, 2019, p. 47). This type of validity is closely related to the method of how the sample of respondents was chosen and whether such a sample is representative of the population. In the cross-sectional study, the external validity can be strong if the random sample technique is used. When non-random techniques are used, the external validity lowers. As mentioned before, the sampling method for this research was convenient. Hence, the external validity is not as strong as it would have been if the sample had been chosen randomly. This is a limitation of the current study, and the authors acknowledge this. The convenience sample was chosen because of the time and resource constraints surrounding this thesis. However, in order to get a sample that is the most representative of the population in a convenient way, the authors aimed to collect as many responses as possible and hence increase the likelihood of collecting answers from diverse respondents and thus enhancing the external validity. In the end, 302 responses were collected.

Ecological validity is concerned with "the question of whether or not social scientific findings are applicable in everyday, naturally occurring settings" (Bell, Bryman & Harley, 2019, p.47). The ecological validity is often weak in cross-sectional research designs as the method of collecting data, in this case, a self-completion questionnaire, is unnatural as it disrupts the natural habitat in which people usually operate (Bell, Bryman & Harley, 2019, p.47). Hence, the authors acknowledge that the findings of this study have limited ecological validity.

Face validity consists of "asking other people whether or not the measure seems to be getting at the concept that is the focus of attention" (Bell, Bryman & Harley, 2019, p.174). Face validity was enhanced by conducting a pilot test. The participants in the pilot test were given a brief explanation of the scope of the thesis and asked to fill in the questionnaire. Afterwards, they provided feedback on whether the questionnaire was clear and captured what it aimed to capture. Additionally, they provided suggestions on how to improve the clarity of the questions. The questionnaire was then adjusted according to this feedback. For example, one respondent pointed out that it was not mentioned anywhere in the questionnaire that consumers would get their deposit back. It was thus added to the questionnaire. The pilot test, therefore, improved the face validity of the survey.

4.7.2. Reliability

Reliability refers to "the question of whether the results of a study are repeatable" (Bell, Bryman & Harley, 2019, p.46). It is used to determine whether or not a measure is stable and will not fluctuate throughout different studies. Three factors are commonly considered to check whether a measure is reliable or not. These are stability, internal reliability and inter-rater reliability (Bell, Bryman & Harley, 2019).

The first one is stability, which questions whether a measure will vary or not over time (Bell, Bryman & Harley, 2019). The test that is commonly used to assess the stability of a measure is called the test-retest method. As the name suggests, the same measure is used on two different occasions on the same sample. In case the measure is stable, results in both occasions should be highly correlated. Due to the short period of time in which this thesis was conducted, it was not possible to do the test-retest method to ensure the reliability of the data over time. Moreover, with the current research design and the anonymous convenient sampling method, it would be impossible to administer a test-retest as the identities of the respondents in the current sample are not known to the researchers.

The second factor is inter-rater reliability, which measures consistency when more than one rater is assessing the same set of data (Bell, Bryman & Harley, 2019). Inter-rater reliability is more relevant when raters have to access interviews or open-ended questions. The current research deals mostly with pre-coded outputs, so the discrepancies between raters were insignificant.

However, to ensure the same numerical coding, both authors agreed on assigning the same numerical values to the same variables (e.g. 1= Female, 2 = Male). The coding scheme, which was agreed upon by both authors, is presented in more detail in section *4.9. Data Analysis*.

The third factor is internal reliability, which is concerned with whether or not "respondents' score on any one indicator tends to be related to their scores on the other indicators associated with that concept" (Bell, Bryman & Harley, 2019, p.172). The authors included at least two questions to measure the same concept in order to enhance internal reliability. To verify the internal reliability of the study, a test to determine whether the questions actually measured the same notion was needed.

To measure internal reliability, the authors decided to use Cronbach's alpha because it is one of the measures traditionally used in research (Bell, Bryman & Harley, 2019). Bell, Bryman and Harley (2019, p.173) state that "it essentially calculates the average of all possible split-half reliability coefficients." It measures how related a set of items is as a group and whether the items measure the same underlying construct. According to Pallant (2016), the Cronbach's alpha value should ideally be above 0.7 to be considered reliable. However, according to Taber (2016), Cronbach's alpha above 0.73 is considered high; one above 0.67 is reasonable, and one above 0.58 is satisfactory.

The authors of this thesis administered the test in the statistical program SPSS described in more detail in section *4.9. Data Analysis*. The Cronbach's alpha for attitudes measured by questions 5, 6, and 7, is 0.67, which means that it is *reasonable*. The subjective norms, which are measured by questions 8 and 9, have a Cronbach's alpha of 0.74, which is *high.* The perceived behavioural control, which is measured by questions 10 and 11, has a Cronbach's alpha of 0.6, which is *satisfactory*. The authors acknowledge that the values for attitudes and perceived behavioural control are not ideal (>0.7); however, Pallant (2016) suggests that Cronbach Alpha values are very sensitive to the number of items in the questionnaire. Therefore, it is common to find lower Cronbach's alpha values for short scales with less than ten items (Pallant, 2016). As the authors only included two or three statements to measure each category, slightly lower Cronbach's Alpha values were to be expected.

To further test the internal reliability of the study, the authors divided the sample into two equal parts. The sample of 302 participants was divided randomly in the statistical program SPSS. The whole analysis in this thesis is done on 'Dataset 1', which consists of 151 participants, 'Dataset 2', which consists of the other 151 participants and the 'Total Dataset', consisting of 302 participants. This is done to increase the reliability of the study further and to see whether the findings hold true across different subsets of the population. Such a measure allows for a greater degree of generalizability and mitigates the negative consequences of choosing a convenience sample as the appropriate measure for this study, discussed in detail previously in section *4.5. Data Collection*. Hence, the authors have run the calculation for Cronbach's Alpha, not only on the whole sample, as described above, but also on split sample 'Dataset 1' and 'Dataset 2'. The values differed only very mildly, which suggests that patterns across the two datasets are similar. Thus, as all of the obtained values are at least *satisfactory*, internal reliability is ensured. The results are the following:

	N of items (questions)	**Cases**	**Cronbach's Alpha**
Attitudes 'Dataset 1'	3	151	0.635
Attitudes 'Dataset 2'	3	151	0.706
Attitudes 'Total dataset'	3	302	0.67
Subjective norms 'Dataset 1'	2	151	0.768
Subjective norms 'Dataset 2'	2	151	0.713
Subjective norms 'Total dataset'	2	302	0.736
Perceived behavioural control 'Dataset 1'	2	151	0.595
Perceived behavioural control 'Dataset 2'	2	151	0.623
Perceived behavioural control 'Total dataset'	2	302	0.599

Table 2 - Cronbach's Alpha results

4.8. Ethical considerations

Ethics in business research is particularly important and must be taken into consideration throughout the entirety of a study (Bell, Bryman & Harley, 2019). This thesis respects the four

ethical principles cited by Bell, Bryman and Harley (2019), namely 1) avoidance of harm, 2) informed consent, 3) respect of privacy, and 4) preventing deception.

Firstly, harm entails different facets: physical pain, stress, and negative impact on self-esteem or career prospects (Bell, Bryman & Harley, 2019). It is the responsibility of the researchers to minimise the potential harm done to a study's participants as much as possible. To ensure that no harm was done in the conduct of this research, participation in the survey was entirely voluntary, and participants were free to opt-out at any time. This was indicated in the accompanying text provided to the respondents before starting the survey. Moreover, all the respondents were aged 18 and over in order to ensure their fully informed consent. Underaged children are much more vulnerable since it can be difficult to ensure that they fully comprehend the implications of taking part in the study.

Secondly, informed consent, which requires that participants receive all the information on a study in order to decide whether they wish to take part in it or not (Bell, Bryman & Harley, 2019), was ensured by disclosing complete information about the scope of the survey and mentioning that the collected data would only be used for academic purposes. The information about the estimated time the survey takes was also included. Hence, the potential participants had all means to voluntarily make an informed decision on whether to participate in the study or not.

Thirdly, privacy, which may feel threatened by questions deemed too intrusive by the participants (Bell, Bryman & Harley, 2019), was guaranteed as the survey was entirely anonymous and the collected data is stored in an encrypted form. Moreover, the participants always had the option to stop answering the survey if the questions made them feel uncomfortable.

Fourthly, deception, which happens when researchers give a misleading idea of their research objectives (Bell, Bryman & Harley, 2019), was prevented by being clear and honest about the aims of the study. This aim was also described in the accompanying text of the survey.

Lastly, out of consideration for the LGBTQ+ community, and as mentioned before, for the question "What is your gender?" in addition to the traditional male and female options, the participants had the possibility to choose "Other" or "Prefer not to say".

4.9. Data analysis

The following section is concerned with the analysis of the collected data. The data gathered for the purpose of this thesis is primary. In this paper, the primary analysis is performed, meaning that the researchers that collected the data also conducted the analysis (Bryman, Bell & Harley, 2019).

As the data was collected via convenience sampling, it is harder to compare to other studies that collected more representative data. In order to mitigate this bias and limitation of the study and increase the study's internal reliability, the authors have decided to split the samples of 302 respondents into two equal, randomly selected datasets. Both datasets were then analysed in the same way by using the same statistical methods in order to see whether the patterns that they produce are the same.

4.9.1. SPSS variables

The authors of this thesis have decided to use SPSS (Statistical Package for the Social Sciences) software to run all the statistical analyses. SPSS is a widely used software for statistical analysis in various research domains. After the data collection was completed, the data sheet was downloaded from Google Forms in Excel format. The data was then copied to SPSS and coded, and the scale of measurement was chosen for each variable *(see Table 3)*.

In order to understand the attitudes of consumers towards reusable returnable packaging, three questions were asked (questions 5, 6 & 7). To understand consumers' perceived behavioural control and subjective norms, two questions per concept were asked (questions 8 & 9 for subjective norms, and 10 & 11 for perceived behaviour control). However, it was necessary to group these questions together in one variable in order to conduct the analysis. To do so, two methods were chosen.

The first chosen method consisted of computing the variables according to the mean, which is a commonly used procedure. The variables 'Attitudes', 'Subjective_norms' and 'Perceived_behavioural_control' were formed by combining the scores for all questions related to the same concept and calculating a mean out of them. This is a standard way of combining multiple variables into a single variable (Pallant, 2016).

However, even though combining variables based on the mean is a common solution, the authors acknowledge that the mean significantly reduces the accuracy of the information provided by the respondents. Hence, a second method to combine variables, factor analysis, was explored. The factor analysis is a “data reduction technique” (Pallant, 2016, p.182). It examines a large sample of variables to see if the data can be condensed or summarised in a smaller group of variables (Pallant, 2016). For this method to be successful, it is important to have a relatively large sample size. Tabachnick and Fidell (2013) recommend at least 300 cases. Since the survey got 302 answers, this criterion is respected.

The by-product of the factor analysis is the factor scores, which are “composite measures that can be computed for each subject on each factor” (Burns & Burns, 2012, p.459). The factor scores were essentially what the authors of this thesis were interested in. Separate factor analysis was done for the set of 3 questions regarding attitudes, two questions regarding subjective norms and two questions regarding perceived behavioural control. This was done on both datasets as well as the total dataset. For the purpose of the factor analysis, KMO and Bartlett's of sphericity, Scree plot and Varimax rotation were used. The KMO and Bartlett's test "measures the sampling adequacy, which should be greater than 0.5 for a satisfactory analysis to proceed" (Burns & Burns, 2012, p.454). This condition was satisfied in all factor analyses performed in this research. By applying Kaiser's rule and the scree test, in the factor analysis for attitudes, subjective norms and perceived behavioural control, only one factor was extracted, and hence the solution could not be rotated. Nevertheless, the factor scores were computed and used as an alternative to computing variables based on the mean. The following SPSS variables were created by the factor analysis 'Attitudes_fac_analysis', 'Sub_norms_fac_analysis', and 'Perc_beh_control_fac_analysis'.

The variables were computed using two different methods to maximise the results' validity and reliability. The following table summarises how the data was entered into SPSS software.

Question number	*SPSS name*	*Type*	*Coding instructions*	*Scale of measurement*
1	Age	Numeric	1 = 18-24 2 = 25-34 3 = 35-44	Ordinal

			4 = 45-54 5 = 55-64 6 = 65 and over	
2	Gender	Numeric	1= Female 2 = Male 3 = Other 4 = Prefer not to say	Nominal
3	Education	Numeric	1 = No diploma 2= Vocational/professional diploma 3 = High school diploma 4 = Bachelor's degree 5 = Master's degree 6 = Doctorate degree	Ordinal
4	Past_experience	Numeric	1 = No 2 = Yes	Nominal
5	Att_Good_environment	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree 4 = Disagree 5 = Strongly disagree	Ordinal
6	Att_Good_me	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree 4 = Disagree 5 = Strongly disagree	Ordinal
7	Att_Good_shopping	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree 4 = Disagree 5 = Strongly disagree	Ordinal
8	Sub_norm_People_import	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree 4 = Disagree 5 = Strongly disagree	Ordinal
9	Sub_norm_People_identify	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree	Ordinal

			4 = Disagree 5 = Strongly disagree	
10	Perc_beh_cont_Able_to_use	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree 4 = Disagree 5 = Strongly disagree	Ordinal
11	Perc_beh_cont_in_control	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree 4 = Disagree 5 = Strongly disagree	Ordinal
12	Interest	Numeric	1 = Strongly disagree 2 = Disagree 3= Neither agree nor disagree 4 = Disagree 5 = Strongly disagree	Ordinal
5,6,7	Attitudes	Numeric	N/A	Scale
8,9	Sub_norms	Numeric	N/A	Scale
10, 11	Perc_beh_control	Numeric	N/A	Scale
5,6,7	Attitudes_fac_analysis	Numeric	N/A	Scale
8,9	Sub_norms_fac_analysis	Numeric	N/A	Scale
10,11	Perc_beh_control_fac_analysis	Numeric	N/A	Scale

Table 3 - Coding instructions (SPSS)

4.9.2. Statistical methods

The nonparametric measures were to be used as the collected data is either dichotomous, nominal or ordinal. Nonparametric statistics are used when the data does not involve numerical values and does not follow an interval/ratio scale (Pallant, 2016). Instead, these statistics rely on rankings and order. Consequently, traditional parametric measures and methods such as mean,

Pearson correlation, variance, and standard deviation were not applicable for analysing the data gathered in this research. Nonparametric statistical methods are utilised when the data does not adhere to conventional models like the normal distribution or linear regression models (Pallant, 2016). Nonparametric statistics do not assume a normal distribution for the data; instead, the shape of the distribution is estimated using nonparametric calculations (Pallant, 2016). Hence, the primary techniques employed in this research for data analysis were descriptive statistics (frequencies and cross-tabulations) and nonparametric bivariate correlations (Spearman's rho).

Using non-parametric statistics comes with limitations. For example, one of the fundamental limitations is that they have low statistical power and efficiency, often requiring large sample sizes to achieve confidence levels comparable to traditional parametric counterparts (Pallant, 2016). However, the sample size achieved during this thesis's duration is relatively big, and therefore, this limitation is mitigated to a certain extent. The non-parametric tests are useful and appropriate when the data distribution is unknown or when it violates assumptions needed to use parametric statistical techniques (Pallant, 2016); however, such tests may result in the loss of efficiency if a reasonable parametric distribution can be assumed. Furthermore, once researchers rely on ranks and categories, this inevitably leads to a loss of information by discarding precise numerical values, e.g. when a respondent chooses an option of an age category, researchers lose the precise information about the respondent's age. Hence, non-parametric statistical methods have limitations that the authors acknowledge.

4.9.2.1. Spearman’s correlation

To uncover relationships that lead to rejecting or not rejecting the hypotheses proposed in this thesis, a correlation analysis had to be conducted. The correlation analysis is used to: “describe the strength and direction of the linear relationship between two variables,” (Pallant, 2016, p.132). There are a variety of measures of correlations that can be used, depending on the nature of the collected data. The most common measure is Pearson correlation, which is used for interval/ratio data, which is not the case in this thesis. If the criteria for using Pearson correlation are not met, Spearman’s correlation can be used (Pallant, 2016). Spearman’s rho is a nonparametric measure of correlation that can be used when both variables are ordinal, or one variable is ordinal, and the other is interval/ratio (Bell, Bryman & Harley, 2019). As most of the

collected data fit these categories, Spearman's correlation coefficient was used to test the majority of the hypotheses proposed in this thesis.

Spearman's rho assesses the strength and the direction of the relationship between two variables. It ranges from -1 to 1, where negative values reflect a negative relationship (when one variable increases, the other decreases), 0 means no relationship, and positive values signal a positive relationship (when one variable increases, the other increases as well) (Pallant, 2016). "The size of the absolute value (ignoring the sign) provides an indication of the strength of the relationship" (Pallant, 2016, p.132). The closer to -1 or 1 the resulting value is, the stronger the relationship between the two variables. If the value equals -1 or 1 exactly, this signifies the perfect correlation when the value of one variable "can be determined exactly by knowing the value of the second variable" (Pallant, 2016, p.132). According to Cohen (1988), the values of correlations can be interpreted as follows: rho = 0.1 to 0.29 is considered *a small correlation*, rho = 0.30 to 0.49 is considered *medium*, and rho = 0.5 to 1.0 is considered *large*.

Another aspect to consider while working with Spearman's correlation is the significance level. "The level of statistical significance does not indicate how strongly the two variables are associated, but it indicates how much confidence we should have in the results obtained," (Pallant, 2016, p.138). According to Pallant (2016), the significance is influenced by the sample size; for smaller samples, there may be moderate correlations uncovered that do not reach the level of significance that is traditionally requested to be seen as credible *($p<0.05$)*. However, that is often not the case in samples with more than 100 participants. As the authors of this thesis have managed to collect 302 responses, the calculation of significance levels should not be problematic.

4.9.2.2. Chi-square and Cramér's V

The chi-square test is used to examine relationships between two nominal variables or one nominal and one ordinal variable (Bell, Bryman & Harley, 2019). It is applied to cross-tabulations, and it shows the confidence in which a relationship between the variables can be claimed. "The test works by calculating for each cell in the table an expected frequency or value - that is, one that would occur on the basis of chance alone. The chi-square value is produced by calculating the differences between the actual and expected values for each cell in

the table and then summing up the differences" (Bell, Bryman & Harley, 2019, p.329). The Chi-Square measures the discrepancy between observed and expected frequencies (Pallant, 2016). The higher the Chi-Square is, the higher the discrepancy is. To prove that there is a relationship between two variables, the results of the Chi-square test have to be statistically significant ($p<0.05$) (Pallant, 2016).

Cramér's V is also traditionally employed in bivariate analysis to understand the link between a nominal and ordinal variable or two nominal variables (Bell, Bryman & Harley, 2019). It measures the strength of the relationship between two variables and ranges from 0 to 1. This measurement only takes a positive value. Therefore, it only examines the strength of the relationship between two variables, but it does not provide information about the direction of the relationship. Cramér's V below 0.2 is considered *weak*, one between 0.2 and 0.6 *moderate*, and one above 0.6 *strong* (IBM, 2023).

5. Results

The following section will outline the findings of the empirical research. A brief overview of the results of the survey will be provided, followed by an in-depth analysis.

5.1. Frequencies

The first test that the authors ran in the SPSS was part of the descriptive statistics package, related to frequencies of answers. 302 people filled out the questionnaire, all the responses were valid, no missing responses were recorded.

5.1.1. Interest

The questionnaire showed that 47.7% of the respondents *strongly agree* that they are interested in buying products in reusable packaging and returning them, 32.8% *agree*, 13.2% *neither agree nor disagree*, 4.6% *disagree* and 1.7% *strongly disagree*.

	Frequency	**%**
Strongly disagree	5	1.7
Disagree	14	4.6
Neither agree nor disagree	40	13.2
Agree	99	32.8
Strongly agree	144	47.7
Total	302	100.0

Table 4 - Interest (frequency)

5.1.2. Age

The survey sample mainly consisted of young people. 30.8% were between 25 and 34 years, 30.5% were between 18 and 24 years old, 15.6% were between 35 and 44 years old, 13.6% were between 45 and 54 years old, 7% were between 55 and 64 years old, and only 2.6% were 65 and over.

	Frequency	%
18-24	92	30.5
25-34	93	30.8
35-44	47	15.6
45-54	41	13.6
55-64	21	7.0
65 and over	8	2.6
Total	302	100.0

Table 5 - Age (frequency)

5.1.3. Gender

Among these 302 participants, 54.6% were female, 44% were male, 0.3% selected the option "other", and 1% selected the option "prefer not to say".

	Frequency	%
Female	165	54.6
Male	133	44.0
Other	1	0.3
Prefer not to say	3	1.0
Total	302	100.0

Table 6 - Gender (frequency)

5.1.4. Education level

Concerning the level of education, most of the survey respondents were highly educated. Indeed, 42.1% had a masters' degree, 33.8% had a bachelor's degree, 15.9% had a high school diploma, 3.6% had a doctorate degree, 3.6% had a professional/vocational diploma and only 1% did not have a diploma at all.

	Frequency	%
No diploma	3	1.0
Professional/vocational diploma	11	3.6
High school diploma	48	15.9
Bachelor's degree	102	33.8
Master's degree	127	42.1
Doctorate degree	11	3.6
Total	302	100.0

Table 7 - Education level (frequency)

5.1.5. Past experience

An overwhelming majority had past experience with returning packaging (70.9%). Whereas 29.1% reported no previous experience with returning packaging.

	Frequency	%
Yes	88	29.1
No	214	70.9
Total	302	100.0

Table 8 - Past experience (frequency)

5.1.6. Attitudes

Concerning the attitudinal factors, for the question about returning packaging being good for the environment, 69.9% strongly agreed, 25.5% agreed, 3% neither agreed nor disagreed, 1% disagreed, and 0.7% strongly disagreed. For the question about returning packaging being good for them, 38.4% strongly agreed, 32.1% agreed, 19.9% neither agreed nor disagreed, 7.3% disagreed, and 2.3% strongly disagreed. Only 23.8% of respondents strongly agreed that

returning packaging would be a good shopping experience, while 28.5% agreed, 29.8% neither agreed nor disagreed, 12.3% disagreed, and 5.6% strongly disagreed.

	Good for the environment		**Good for me**		**Good shopping experience**	
	Frequency	*%*	*Frequency*	*%*	*Frequency*	*%*
Strongly disagree	2	0.7	7	2.3	17	5.6
Disagree	3	1.0	22	7.3	37	12.3
Neither agree nor disagree	9	3.0	60	19.9	90	29.8
Agree	77	25.5	97	32.1	86	28.5
Strongly agree	211	69.9	116	38.4	72	23.8
Total	302	100.0	302	100.0	302	100.0

Table 9 - Attitudes (frequency)

5.1.7. Subjective Norms

Concerning the questions relating to subjective norms, 38.1% of respondents agreed that people that are important to them would be interested in buying returnable packaging, 29.8% neither agreed nor disagreed, 20.5% strongly agreed, 8.3% disagreed, and 3.3% strongly disagreed. Furthermore, 39.4% agreed that people they identify with would be interested in buying products in reusable packaging and returning them, 27.8% strongly agreed, 27.2% neither agreed nor disagreed, 4.3% disagreed, and 1.3% strongly disagreed.

	People that are important to me		**People I identify with**	
	Frequency	*%*	*Frequency*	*%*
Strongly disagree	10	3.3	4	1.3
Disagree	25	8.3	13	4.3

Neither agree nor disagree	90	29.8	82	27.2
Agree	115	38.1	119	39.4
Strongly agree	62	20.5	84	27.8
Total	302	100.0	302	100.0

Table 10 - Subjective norms (frequency)

5.1.8. Perceived Behavioural Control

Concerning perceived behavioural control, 42.7% of the participants strongly agreed that they were confident that they would be able to buy products in reusable packaging and return them, 41.4% agreed, 9.6% neither agreed nor disagreed, 6% disagreed, and 0.3% strongly disagreed. Moreover, 38.7% of the respondents strongly agreed that they would be in control of deciding whether to buy products in reusable packaging and return them, 38.4% agreed, 17.5% neither agreed nor disagreed, 4.3% disagreed, and 1% strongly disagreed.

	Able to use		**In control**	
	Frequency	*%*	*Frequency*	*%*
Strongly disagree	1	0.3	3	1.0
Disagree	18	6.0	13	4.3
Neither agree nor disagree	29	9.6	53	17.5
Agree	125	41.4	116	38.4
Strongly agree	129	42.7	117	38.7
Total	302	100.00	302	100.00

Table 11 - Perceived behavioural control (frequency)

5.2. Hypotheses - consumers segments

5.2.1. Age

H4 is concerned with whether there is an association between age and the interest in using reusable returnable packaging. To establish whether there is an association, the authors of this

thesis have run Spearman's rho correlation. It was calculated on both datasets as well as the total dataset. It resulted in a Spearman's rho coefficient of 0.087 on dataset 1, 0.057 on dataset 2 and 0.067 on the total dataset, which signals that the relationship between age and interest is *negligible* (see Table 12). P-values for all both datasets as well as for the total dataset suggest that the relationship is not statistically significant. These results demonstrate that there is no noticeable trend in which older people are more interested in adopting reusable packaging than younger people and vice versa.

The results were further supported by the generation of a cross-tabulation (see Table 13) and the calculation of the percentage of responses associated with each age group. Indeed, it appears that the results do not fluctuate much with different age groups.

Therefore, H4, "*Age is positively associated with the interest in using reusable packaging",* **is rejected**.

Age, Interest	**Dataset 1**	**Dataset 2**	**Total dataset**
Spearman's rho	0.087	0.057	0.067
P-value	0.289	0.489	0.249

Table 12 - Age, Interest (Spearman's rho & P-value)

*Age * Interest*	**Strongly disagree**		**Disagree**		**Neither agree nor disagree**		**Agree**		**Strongly agree**		**Total**	
18-24	2	2.17%	6	6.52%	16	17.39%	25	27.17%	43	46.74%	92	100.00%
25-34	2	2.15%	5	5.38%	10	10.75%	35	37.63%	41	44.09%	93	100.00%
35-44	0	0.00%	2	4.26%	6	12.77%	12	25.53%	27	57.45%	47	100.00%
45-54	0	0.00%	1	2.44%	5	12.20%	16	39.02%	19	46.34%	41	100.00%
55-64	0	0.00%	0	0.00%	3	14.29%	7	33.33%	11	52.38%	21	100.00%

65 and over	1	12.50%	0	0.00%	0	0.00%	4	50.00%	3	37.50%	8	100.00%
Total	5		14		40		99		144		302	

*Table 13 - Age * interest (cross-tabulation)*

5.2.2. Education level

H5 is concerned with whether the level of education is associated with the interest in using reusable returnable packaging. In order to measure the association between education and interest, Spearman's rho was calculated on both datasets 1 and 2 and the dataset as a whole (see Table 14). It resulted in a Spearman's rho coefficient of -0.068 for dataset 1, -0.008 for dataset 2 and -0.038 for the dataset as a whole. This is extremely weak and, therefore, *negligible*. The P-values suggest that this negligible correlation is also statistically insignificant.

To obtain more details about this result, a crosstab was generated, and the percentage of each answer per education level was calculated. The responses were similarly distributed and did not demonstrate any significant difference among categories. Therefore, H5, *"Education is positively associated with the interest in using reusable returnable packaging",* **is rejected**.

Education, interest	**Dataset 1**	**Dataset 2**	**Total dataset**
Spearman's rho	-0.068	-0.008	-0.038
P-value	0.409	0.923	0.509

*Table 14 - Education level * Interest (Spearman's rho & P-value)*

*Education * interest*	**Strongly disagree**		**Disagree**		**Neither agree or disagree**		**Agree**		**Strongly agree**		**Total**	
No diploma	0	0,00%	0	0,00%	0	0,00%	1	33,33%	2	66,67%	3	100,00%
Professional / vocational diploma	0	0,00%	1	9,09%	2	18,18%	4	36,36%	4	36,36%	11	100,00%
High school	1	2,08%	2	4,17%	8	16,67%	15	31,25%	22	45,83%	48	100,00%

diploma												
Bachelor's degree	1	0,98%	4	3,92%	12	11,76%	27	26,47%	58	56,86%	102	100,00%
Master's degree	2	1,57%	7	5,51%	18	14,17%	49	38,58%	51	40,16%	127	100,00%
Doctorate's degree	1	9,09%	0	0,00%	0	0,00%	3	27,27%	7	63,64%	11	100,00%
Total	5		14		40		99		144		302	

*Table 15 - Education level * Interest (cross-tabulation)*

5.2.3. Gender

H6 is concerned with whether gender is associated with the interest in using reusable returnable packaging. As gender is a nominal variable and interest is an ordinal one, to calculate the association between gender and interest, chi-square and Cramér's V were used. In order to be able to calculate the Cramér's V and the Chi–square, it is necessary to have at least five answers per cell in the cross-tabulation. For example, at least five males must have chosen "strongly disagree". Since it was not the case, the authors decided to group the answers "strongly agree" and "agree" as well as "strongly disagree" and "disagree" together. Therefore, there are only three responses left for the analysis - "disagree", "neither agree nor disagree" and "agree". It is also important to note that the answers of the survey participants whose response to the question about gender was either "Other" or "Prefer not to say" had to be disregarded for this specific hypothesis, as not enough answers from these gender categories were collected, and therefore the sample was not significant enough to be analysed. Additionally, it was not possible to calculate the Cramér's V and Chi-Square for the two halves of the sample (dataset 1 and dataset 2) in order to compare them, as the minimum count of five per cell would not have been respected even if only three options - 'agree', 'neither agree nor disagree' and 'disagree' - were to be analysed.

In the case of gender association with interest, the Cramér's V value is 0.155, with a significance of 0.028, as shown in Table 16. It shows a weak correlation between the two variables. The Chi-Square is 7.157 with a significance of 0.028, which indicates that there is a relatively high

level of discrepancy between the observed and expected frequencies. This supports the presence of an association between gender and interest in reusable packaging. The asymptotic significance of 0.028, which is below the commonly used significance level of 0.05, means that the correlation is statistically significant. Therefore, even though the association between gender and interest in reusable returnable packaging is weak, the Chi-Square and asymptotic significance show that there is some association between these two variables.

To understand the direction of this association, the authors decided to calculate Spearman's rho and examine the cross-tabulation. Spearman's rho can also be calculated when one variable is ordinal and the other is dichotomous (Bell, Bryman & Harley, 2019), as is the case with gender and interest. The Spearman's rho is -0.115. Females were coded as "1" and males as "2" in the dataset, hence, the negative correlation shows that females are slightly more interested in reusable packaging than men. Spearman's rho is also statistically significant, as the P-value is 0.047.

Moreover, as shown in Table 17, on average, 80.54% of the respondents "agree" that they are interested in purchasing reusable returnable packaging. Nevertheless, this number is higher for females (84.24%), and lower for males (75.94%). Additionally, on average, 6.38% of all respondents disagree with the statement "I am interested in purchasing reusable returnable packaging". However, this number is higher for males (10.53%) and lower for females (3.03%).

In conclusion, even though the association is weak, it is statistically significant and therefore H6 *"Gender (female) is positively associated with the interest in using reusable returnable packaging"* **is not rejected.**

Gender, interest	**Value**	**Degree of freedom**	**Asymptotic significance**
Pearson Chi-Square	7.157	2	0.028
Cramer's V	0.155		0.028
Spearman's rho	-0.115		0.047

Table 16 - Gender, Interest (Chi-Square and Cramér's V)

*Gender * interest*	**Disagree**		**Neither agree nor disagree**		**Agree**		**Total**	
Female	5	3.03%	21	12.73%	139	84.24%	165	100 %
Male	14	10.53%	18	13.53%	101	75.94%	133	100%
Total	19	6.38%	39	13.09%	240	80.54%	298	100%

*Table 17 - Gender * interest (cross-tabulation)*

5.2.4. Past experience

H7 is concerned with whether past experience is associated with interest in using reusable returnable packaging. To examine the relationship between these variables, the Chi-Square and Cramér's V were calculated. This was done because one variable (interest) is measured on the ordinal scale, while the other (past experience) is measured on the nominal scale. Hence, the most appropriate test is Cramér's V. This test was not possible to administer on each dataset separately, as the conditions to run it were not fulfilled; there were less than five respondents per each cell even when the answers 'agree' and 'strongly agree' & 'disagree' and 'strongly disagree' were combined. Hence, only the value for the whole dataset was calculated while adhering to the test's assumptions. The results are in Table 18. The relationship between past experience and interest in using reusable returnable packaging is 0.121, which means that it is weak. The significance at the level of 0.111 is greater than 0.05. Hence the weak association is statistically insignificant. To further check for more detailed results, a cross-tabulation was generated (see

Table 19), and it indeed seems like the level of interest between people with previous routine experience with returning packaging and people without such experience does not significantly differ. Therefore, H7, "*Previous experience with returning packaging is positively associated with the interest in using reusable returnable packaging*", **is rejected.**

Past experience, interest	**Value**	**Degree of freedom**	**Asymptotic significance**
Pearson Chi-Square	4.396	2	0.111
Cramér's V	0.121	-	0.111

Table 18 - Past experience, Interest (Chi-Square and Cramér's V)

*Past experience * interest*	**Disagree**		**Neither agree nor disagree**		**Agree**		**Total**	
Without past experience	9	10.23%	14	15.91%	65	73.86%	88	100%
With past experience	10	4.67%	26	12.15%	178	83.18%	214	100%
Total	19	6.29%	40	13.25%	243	80.46%	302	100%

*Table 19 - Past experience * interest (cross-tabulation)*

5.3. Hypotheses - Theory of Planned Behaviour

5.3.1. Attitudes

H1 is concerned with whether attitudes toward reusable returnable packaging are associated with interest in using reusable returnable packaging. As mentioned previously, the attitudes towards reusable returnable packaging were observed through questions 5, 6 and 7. These were computed to a single variable by two different methods. First, they were computed by a mean, and second, they were computed by the factor analysis. The Spearman's rho for both datasets as well as the total dataset, and both methods of computation of the variables were calculated (see Table 20).

The calculated values of the rho coefficient vary slightly between different datasets and the method of computation; however, they are all greater than 0.5, which suggests that the correlation between attitudes and interest is *large.* The direction of the relationship is positive, which means that the greater the positive attitudes towards reusable packaging, the greater the interest in purchasing it. Moreover, the P-value of <0.001 shows that the correlation is statistically significant. Indeed, a P-value of <0.001 means that the likelihood of obtaining this correlation by chance alone is very low, at less than 0.1%. One can, therefore, be confident in the existence of a significant association between interest and attitudes. H1, ”*Positive attitudes towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging “* **is not rejected.**

	Dataset 1	**Dataset 2**	**Total dataset**
Spearman’s rho based on variable computed by mean	0.706	0.660	0.684
P-value	<0.001	<0.001	<0.001
Spearman’s rho based on variable computed by factor analysis	0.710	0.661	0.687
P-value	<0.001	<0.001	<0.001

Table 20 - Attitudes (Spearman’s rho and P-value)

5.3.2. Subjective norms

H2 is concerned with whether there is an association between subjective norms and the interest in reusable returnable packaging. The subjective norms on reusable packaging were observed in questions 8 and 9 of the questionnaire. Similarly to attitudes, these two questions were computed to a single variable based on the mean as well as the factor analysis.

The Spearman’s rho was calculated for both datasets as well as the total dataset, and for both methods of computing the variables (see Table 21). Even though the values mildly differ, all are positive and greater than 0.5, which indicates *a large positive relationship.* Therefore, subjective norms are indeed associated with the interest in reusable packaging. Moreover, the P-value is again <0.001, which means that the correlations are statistically significant. Therefore, H2,

"Positive subjective norms towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging", **is not rejected.**

	Dataset 1	Dataset 2	Total dataset
Spearman's rho based on variable computed by mean	0.511	0.572	0.541
P-value	<0.001	<0.001	<0.001
Spearman's rho based on variable computed by factor analysis	0.529	0.571	0.552
P-value	<0.001	<0.001	<0.001

Table 21 - Subjective norms (Spearman's rho and P-value)

5.3.3. Perceived Behavioural Control

H3 is concerned with whether perceived behavioural control towards reusable returnable packaging is associated with interest in using reusable packaging. Similarly to attitudes and subjective norms, questions 10 and 11 from the questionnaire were computed to a single variable via two methods - by the mean and by the factor analysis.

The Spearman's rho was calculated for dataset 1, dataset 2 and the total dataset; both methods of computing the variable were used (see Table 22). Again, the resulting values differ slightly, but all are above the 0.5 level, which shows a *large positive relationship* between perceived behavioural control and interest. This means that perceived behavioural control is associated with the interest in using reusable packaging. Moreover, the P-value is again <0.001, which indicates that the correlation is statistically significant. Therefore, H3, *"Positive perceived behavioural control towards using reusable returnable packaging is positively associated with the interest in using reusable returnable packaging",* **is not rejected.**

	Dataset 1	Dataset 2	Total dataset
Spearman's rho based on variable computed by mean	0.535	0.609	0.569
P-value	<0.001	<0.001	<0.001
Spearman's rho based on variable computed by factor analysis	0.567	0.586	0.594
P-value	<0.001	<0.001	<0.001

Table 22 - Perceived Behavioural Control (Spearman's rho and P-value)

5.4 Results summary

Hypotheses	**Result**
H1: Positive attitudes towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging.	Not rejected
H2: Positive subjective norms towards using reusable returnable packaging are positively associated with the interest in using reusable returnable packaging.	Not rejected
H3: Positive perceived behavioural control towards using reusable returnable packaging is positively associated with the interest in using reusable returnable packaging.	Not rejected
H4: Age is positively associated with the interest in using reusable packaging.	Rejected
H5: Education is positively associated with the interest in using reusable returnable packaging.	Rejected

H6: Gender (female) is positively associated with the interest in using reusable returnable packaging.	Not rejected
H7: Previous experience with returning packaging is positively associated with the interest in using reusable returnable packaging.	Rejected

Table 23 - Summary of the results

6. Discussion

The following section aims to discuss the findings. It compares and positions them with the previous literature that was identified in the literature review. It builds on the analysis from the previous chapter. Moreover, it highlights the contribution of the thesis to the understanding of consumers' interest in reusable returnable packaging.

6.1. Interest

The study results showed that the questionnaire participants were generally interested in using reusable returnable packaging. In the survey, 80.5% of respondents stated that they either strongly agree or agree with the statement: *'I am interested in buying products in reusable packaging and returning it'*. On the other hand, only 6.3% of respondents indicated that they either disagreed or strongly disagreed with the same statement. Hence, the overarching research question '*To what extent are consumers interested in using reusable returnable packaging?'* was answered. Consumers seem to be highly interested in adopting reusable returnable packaging, which has implications for both academia and practice.

As the interest seems to be substantial, there is a need for more research on the topic of consumers' perceptions of reusable returnable packaging. As discussed in the literature review, the topic of reusable returnable packaging as well as what consumers think about it is highly understudied. This thesis produced results that can be built upon in future research. The ideas on what future research could be focused on are summed up in the section '*7.2. Suggestions for future research*'.

Regarding practical implications, the high percentage of respondents expressing interest in reusable returnable packaging suggests growing market demand for sustainable packaging solutions. However, the sample responses collected in this thesis indicate that there is a business opportunity for companies. Additionally, there is an opportunity for new companies to enter the market with innovative reusable returnable packaging solutions. Firms can capitalise on it by developing and promoting reusable returnable packaging options. Investing in research and development to create innovative, functional, aesthetically pleasing and, most importantly,

environmentally superior reusable packaging can give companies a competitive edge. Embracing reusable returnable packaging can also enhance a company's brand image as environmentally conscious and socially responsible, which can, in turn, help companies differentiate themselves from competitors and attract environmentally conscious customers. Furthermore, businesses that explore the options on how to prepare to comply with the European Green Deal and other existing regulations on reducing the negative environmental impact of their current packaging should consider the possibility of implementing reusable returnable packaging.

6.2. Attitudes

The findings of the study, regarding attitudes, were in line with the Theory of Planned Behaviour and previous literature. Indeed, consumers whose attitudes towards reusable returnable packaging were more positive were more likely to express interest in purchasing such packaging. This holds important implications for both theory and practice. Nevertheless, it is vital to note that since the findings are based on a convenience sample, they are not generalizable.

On the theoretical level, these results support the Theory of Planned Behaviour by confirming that attitudes are associated with behavioural intention. Indeed, according to this theory, attitudes represent a person’s evaluation of a behaviour. In the context of reusable returnable packaging, people with more positive attitudes towards reusable returnable packaging are more likely to be interested in it. Therefore, by demonstrating that attitudes are associated with the consumers’ interest in such packaging, this study supports the validity of the theory.

On the practical level, the positive association between attitudes and interest in reusable packaging holds important implications for marketers. Indeed, they can leverage this insight to create effective strategies to develop or promote such packaging. Companies can increase consumers’ interest in reusable returnable packaging by focusing on improving their positive attitudes through educational campaigns, rewards and persuasive communication tactics.

6.3. Subjective norms

The findings of this study revealed a significant positive association between subjective norms and interest. This suggests that consumers are more likely to be interested in reusable packaging when they feel greater social pressure and influence from their social group, which is in line with

previous literature and the Theory of Planned Behaviour. This carries implications both for theory and practice. However, it is important to note that the findings are based on a convenience sample and are not necessarily generalisable.

From a theoretical perspective, the results support the Theory of Planned Behaviour by showing that subjective norms are significantly associated with consumers' interest in reusable returnable packaging. Subjective norms are a person's perception of social norms and the degree to which an individual feels pressure to those norms.

From a practical perspective, the positive association between subjective norms and interest in reusable returnable packaging highlights the importance of leveraging social pressure and influence in order to promote reusable returnable packaging solutions. For example, companies could create social marketing campaigns that emphasise the widespread acceptance and positive outlook on reusable packaging in order to increase its adoption.

6.4. Perceived behavioural control

The results of this study showed a significant positive association between perceived behavioural control and consumers' interest in reusable returnable packaging, which aligns with the Theory of Planned Behaviour. This suggests that consumers are more likely to show interest in reusable returnable packaging options when they perceive a greater degree of control over the decision. These findings have theoretical and practical implications for both academia and business practice. Nevertheless, it is important to note that since the findings are based on a convenience sample, they are not generalizable.

On the theoretical side, the results support the Theory of Planned Behaviour. Perceived behavioural control refers to a person's perception of the ease or difficulty of performing a specific behaviour. In the context of reusable packaging, consumers who feel a higher sense of control believe that they have the skills, resources, knowledge and access necessary to purchase reusable returnable packaging.

On the practical side, the positive association between perceived behavioural control also holds significant implications for strategies that aim to promote reusable packaging. Indeed, by removing the barriers that negatively impact consumers' perceived behavioural control over

purchasing reusable packaging, companies can effectively increase consumers' interest in such packaging. Businesses could, for example, improve accessibility and convenience, and educate consumers on the benefits of reusable packaging. In conclusion, the positive association between perceived behavioural control and interest highlights the importance of making access to reusable packaging as easy and convenient as possible.

6.5. Age

The results of the questionnaire conducted as part of this thesis showed only a negligible and insignificant association between age and interest in using reusable returnable packaging. Hence, hypothesis H4 was rejected. While examining the previous literature, the authors of this thesis realised that the research on the impact of age on environmental concerns is contradictory. However, more literature seemed to be leaning towards older generations being more likely to behave in an environmentally friendly way. The results of this thesis, however, do not suggest that older generations could be more interested in reusable returnable packaging. Hence, drawing from the sample data gathered within this thesis, the implication for businesses is that there may exist more effective factors, beyond age, for companies to consider when targeting specific consumer segments for the successful implementation of reusable returnable packaging initiatives.

However, it is essential to note that the sample used in this research is not truly representative of the population, as most of the respondents were young. Indeed, 76% of the respondents were below the age of 45. Hence, further research that would confirm these results on a more representative sample is desirable.

6.6. Education level

The results of the survey showed a statistically insignificant and very weak (negligible) association between education and the interest in buying products in reusable returnable packaging and returning it. Therefore, the hypothesis H5 was rejected. This is in contrast with the previous literature, which suggested that consumers with higher levels of education are more likely to engage in reusable packaging systems. The questionnaire in this thesis did not provide any indication that this would be the case. Therefore, based on the sample of responses collected

in this thesis, it seems that businesses should not target a specific consumer segment based on the level of education. There are likely no significant differences in consumers' interest in reusable returnable packaging related to education level.

The results may differ from the previous research due to the fact that the previous studies were not focused on reusable *returnable* packaging in particular. Moreover, when it comes to education levels, the sample used in this thesis is not truly representative of the population as a whole. Indeed, 79.5% of the respondents had at least a bachelor's degree. Thus, further research investigating this relationship on a sample representing society more closely is desirable.

6.7. Gender

The results of the study showed a weak association between gender and interest in reusable packaging. In the literature review, it was discovered that even though there are mixed observations, women are generally considered to be more concerned about the environment than men. This was also revealed by the sample in this research, even though the association is weak. The weak association suggests that while gender may play a minor role in influencing consumers' interest in reusable returnable packaging, it is not a determining factor. However, it should be noted that since the association is weak, this finding must be interpreted with caution. Moreover, the results are based on a convenience sample, which is not generalisable.

The findings have practical implications for companies. This indicates that marketers should not necessarily rely solely on gender to create marketing campaigns to increase interest in reusable packaging. Nevertheless, it might still be relevant to consider gender differences when creating marketing strategies. For instance, knowing the underlying cause of the slight difference in interest between genders could help to create tailored approaches that appeal more to certain genders. This can entail emphasising certain advantages of reusable packaging that appeal more to one gender or addressing potential barriers that are more common among one gender.

In conclusion, while a weak but positive association between gender and consumers' interest in reusable returnable packaging was found in this study, it should be interpreted as a supplementary factor rather than a dominant influence. The practical implications of this finding suggest the importance of considering gender differences in marketing and communication

efforts while recognizing that other individual factors and beliefs likely have a more substantial impact on consumers' interest in reusable returnable packaging options.

6.8. Past experience

The results from the questionnaire uncovered only a negligible link between the past/current experience with routinely returning the packaging and the interest in using reusable returnable packaging. Thus, hypothesis H7 was rejected. Such a finding contrasts previous literature claiming that past experience should be added to the Theory of Planned Behaviour as another predictor of behavioural intention. However, it is in line with the current version of the Theory of Planned Behaviour and the comment from (Ajzen, 1991), the author of the aforementioned theory, who did not see past experience as a suitable extension of the Theory of Planned Behaviour.

Hence, based on the sample of respondents in this thesis, the implications for the practice are that past experience is not a very useful factor based on which to target consumers in the early stages of the implementation of reusable returnable packaging. Past experience does not seem to impact consumers' interest in engaging in reusable returnable packaging systems. The implication for academia is that the relationship between past experience and behavioural intention and the potential extension of the Theory of Planned Behaviour should be tested further, perhaps in different contexts.

7. Conclusion

The purpose of this thesis was to extend the understanding of consumers' perceptions of reusable returnable packaging. To do so, the following research questions were formulated:

1. *To what extent are consumers interested in using reusable returnable packaging?*
2. *Are the factors identified in previous research impacting consumers' decisions on whether to use reusable returnable packaging?*
3. *Which end consumer segments are the most likely to be interested in using reusable returnable packaging?*

To answer these questions, a cross-sectional research design with a survey method on a sample of 302 individuals was conducted. The results have implications for both theory and practice. The study added to practice by improving the understanding of the perspectives of consumers by revealing a significant interest of consumers in reusable returnable packaging. Indeed, further studies in academia are needed to better understand this phenomenon.

It was discovered that, in line with previous literature, the factors identified by the Theory of Planned Behaviour, namely attitudes, subjective norms, and perceived behavioural control, are associated with interest in reusable returnable packaging. However, the factors identified in previous literature (age, gender, education and past experience) were not always associated with interest in reusable returnable packaging in the context of our sample. Indeed, age, education and past experience did not show a significant association with the interest in reusable returnable packaging, and gender (female) only showed a weak positive association with the interest.

As mentioned above, in the sample that was used to conduct this research, demographic factors are not or only weakly associated with interest in reusable packaging. Hence, it was not possible to discover a specific demographic group, consumer segment, that would be more interested in reusable returnable packaging than other demographic groups.

Additionally, it is important to highlight the exploratory nature of this thesis, because, as of today, little is known about consumers' interest in reusable returnable packaging. Indeed, it is currently not widely available, and therefore, it was not possible to examine the actual behaviour

of consumers. Thus, this research is based on a self-completion questionnaire and not on observations. Further research is needed to deepen the understanding of consumers' perceptions of reusable returnable packaging.

7.1. Limitations

It is important to acknowledge the limitations that may have influenced the study's findings and interpretations. By addressing these limitations, the authors of this thesis aim to enhance the transparency and reliability of the study, promoting a more nuanced understanding of the topic.

The first limitation is the cross-sectional nature of the current research. As mentioned before, due to this design, researchers were unable to find causal relationships, but only associations. Hence, the current research uncovered relationships between various variables, however, the causal direction cannot be confidently claimed. Hence, future research should be focused on confirming the research results via studies with different research designs, such as experimental or longitudinal.

The second limitation is directly linked to the questionnaire approach that was chosen. Since the authors were not there to explain the questions, it might have occurred that a respondent did not understand a question correctly and therefore answered in a biassed way. To mitigate this risk, a pilot test was conducted on five individuals, who were then asked whether all the questions were clear and easy to understand. The questions that the pilot test's participants identified as unclear were then adjusted.

The third limitation is also associated with the questionnaire method. The actual behaviour was not observed, and it is possible that there is a discrepancy between what participants say or think they would do and what they would actually do. To mitigate this effect, different questions measuring the same element were asked.

The fourth limitation is the social desirability bias. It refers to the tendency people have to answer in a way that makes them look good or is socially acceptable rather than answering honestly. It can lead to inaccurate data, as it might distort the participants' true opinions. To mitigate this effect, the survey was entirely anonymous.

The fifth limitation of the study in general is the sampling method. The convenience sample was used, which led to study results that are not fully generalizable. It is because the sample is not representative of the general population. It was done due to time and resources constraints, hence, future research on a more representative sample is desirable.

7.2. Suggestions for future research

The suggestions for future research were explored throughout the thesis, however, the following section provides their summary.

Since the sample in this research was convenient and therefore not generalizable, further research should include the use of a more representative sample, such as the random sample. Moreover, an experimental or longitudinal study should be conducted in order to see the causal effect and actually observe the behaviour. Additionally, further research should explore the link between past experience and behavioural intention, since past experience with reusable packaging within our specific sample was not associated with interest in such packaging. However, some researchers (e.g. Perugini & Bagozzi, 2001) claim that past experience should be added as a factor predicting behavioural intention to the Theory of Planned Behaviour. It would also be interesting to look into the driving forces behind attitudes, perceived behavioural control and subjective norms in relation to reusable returnable packaging. Finally, further research on the association between gender and interest in reusable packaging is needed, because previous literature provides mixed findings and this study only showed a weak association between those two variables.

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Appendix A

Survey on Consumers' Perceptions and Interest in Using Reusable Returnable Packaging

Dear Participant,

We invite you to participate in a study examining consumers' perceptions and interest in using reusable returnable packaging. Reusable returnable packaging refers to packaging that is returned to the retailer or manufacturer after use, often in exchange for a deposit, and then cleaned and refilled again for future purchases.

This study is part of a degree project in MSc in International Strategic Management at Lund University. This survey aims to gain insights into your attitudes about reusable returnable packaging and your engagement in existing packaging returning systems (e.g. deposit systems for PET bottles and aluminium cans).

Your participation is entirely voluntary and anonymous and you can opt out at any time. Your responses will be kept confidential, the collected data will be stored in encrypted form and will only be used for academic purposes.

The survey consists of 12 questions and should take at most 5 minutes to complete. If you can't fill in the survey right now, you can do it until May 7th. Your participation in this study is greatly appreciated.

If you have any questions or concerns, please do not hesitate to contact us.

Thank you for your time and contribution!

Michaela Hanusiakova (mi1330ha-s@student.lu.se) & Aline Fort (al2071fo-s@student.lu.se)

Section 1:

1. How old are you?
   - ☐ 18-24
   - ☐ 25-34
   - ☐ 35-44
   - ☐ 45-54
   - ☐ 55-64
   - ☐ 65 and over

2. What is your gender?
   - ☐ Female
   - ☐ Male

- ☐ Other
- ☐ Prefer not to say

3. What is the highest level of education you have completed?
   - ☐ No diploma
   - ☐ High school diploma (equivalent to A levels)
   - ☐ Professional/vocational diploma
   - ☐ Bachelor's degree
   - ☐ Master's degree
   - ☐ Doctorate degree

4. Do you have experience, past or current, with routinely returning packaging (bringing back empty food or drink containers to a retailer or producer)?
   - ☐ Yes
   - ☐ No

Section 2:

Consumers' perceptions

Reusable returnable packaging is a packaging that is returned to the retailer or manufacturer after being used, often in exchange for a deposit. It is then cleaned and refilled again for future purchases. This can include containers, bags, and other materials that are designed to be durable and reusable. In this section, we would like to understand your perceptions of using reusable returnable packaging and your potential interest in using such packaging if it was available in your grocery shopping experience.

Imagine, you go to the supermarket and you purchase jam in a glass jar, ice cream in a steel container and oats in a plastic container. You then consume the products and once the packaging is empty you bring it back to the collection point which can be located at the retailers or producers premises.

Please rate the following statements on a scale of 1 to 5, where 1 means you strongly disagree with the statement, and 5 means you strongly agree.

1 - Strongly Disagree
2 - Disagree
3 - Neither Agree Nor Disagree
4- Agree
5- Strongly Agree

5. Buying products in reusable packaging and returning it would be good for the environment (lower negative impact than single-use packaging).
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree

6. Buying products in reusable packaging and returning it would be good for me.
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree

7. Buying products in reusable packaging and returning it would be a good shopping experience.
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree

8. People who are important to me would be interested in buying products in reusable packaging and returning it.
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree

9. People I identify with would be interested in buying products in reusable packaging and returning it.
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree

10. I am confident that I would be able (capable) to buy products in reusable packaging and return it.
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree

11. I would be in control of deciding whether I would buy products in reusable packaging and return it.
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree

12. I am interested in buying products in reusable packaging and returning it.
    - ☐ 1 - Strongly disagree
    - ☐ 2 - Disagree
    - ☐ 3 - Neither agree nor disagree
    - ☐ 4 - Agree
    - ☐ 5 - Strongly agree