Introducing a modern milk man in Germany?

Drivers and barriers for the adoption of reusable packaging systems in Germany – the case of the reusable packaging platform Loop

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Abstract

This thesis investigates the potential adoption of a reusable packaging system, exemplified by Loop, on the German market. With the increasing importance of sustainability awareness on the rise, the study aims to determine the attitudes and preferences of German consumers towards the introduction of Loop. The platform Loop offers a circular economy approach and represents an innovative solution in line with a regulatory environment that emphasizes the reduction of single-use plastic in Germany. To measure consumer acceptance and improve the adoption process, the study examines the drivers and barriers, as well as the profile of German consumers considering Loop as an alternative.

Through in-depth interviews and an online survey, German consumers express awareness of the importance of sustainability, but highlight challenges such as limited alternatives and cost issues. The initial impressions of Loop are positive, although with concerns about convenience, hygiene, and costs. What drives the adoption of Loop forward is the pro-sustainable attitude of Germans, their willingness to pay for that and their familiarity with existing return systems. The study provides insights into consumer behavior, preferences, and potential barriers. These findings provide valuable guidance for companies and policymakers looking to introduce sustainable packaging, specifically, reusable packaging systems, with the awareness of consumer expectations and addressing concerns about the adoption process.

Keywords: reusable packaging system, sustainable packaging, drivers, barriers, innovation, Loop

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Abstrato

Esta tese investiga a potencial adoção de um sistema de embalagens reutilizáveis, exemplificado pelo Loop, no mercado alemão. Com a crescente importância da consciência da sustentabilidade, o estudo tem como objetivo determinar as atitudes e preferências dos consumidores alemães relativamente à introdução do Loop. A plataforma Loop oferece uma abordagem de economia circular e representa uma solução inovadora em conformidade com um ambiente regulamentar que enfatiza a redução do plástico de utilização única na Alemanha. Para medir a aceitação dos consumidores e melhorar o processo de adoção, o estudo examina os fatores e as barreiras, bem como o perfil dos consumidores alemães que consideram o Loop como uma alternativa.

Através de entrevistas aprofundadas e de um inquérito em linha, os consumidores alemães mostram-se conscientes da importância da sustentabilidade, mas destacam desafios como alternativas limitadas e questões de custo. As impressões iniciais do Loop são positivas, embora com preocupações sobre a conveniência, a higiene e os custos. O que impulsiona a adoção do Loop é a atitude pró-sustentável dos alemães, a sua disponibilidade para pagar por isso e a sua familiaridade com os sistemas de devolução existentes. O estudo fornece informações sobre o comportamento, as preferências e os potenciais obstáculos dos consumidores. Estas conclusões fornecem orientações valiosas para as empresas e os decisores políticos que pretendem introduzir embalagens sustentáveis, especificamente sistemas de embalagens reutilizáveis, tendo em conta as expectativas dos consumidores e abordando as preocupações sobre o processo de adoção.

Palavras-chave: sistema de embalagem reutilizável, embalagem sustentável, motivadores, barreiras, inovação, Loop

Título: Introduzir um leiteiro moderno na Alemanha? Motivadores e barreiras para a adoção de sistemas de embalagens reutilizáveis na Alemanha – o caso da plataforma de embalagens reutilizáveis Loop

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List of Abbreviations

ANOVA	Analysis of Variance
ANCOVA	Analysis of Covariance
β	Standardized coefficient
e.g.	Exempli gratia
EMF	Ellen McArthur Foundation
et al.	Et alii
EU	European Union
FMCG	Fast moving consumer goods
H	Hypothesis
KMO	Kaiser-Meyer-Olkin test
n.d.	No date
PET	Polyethylene terephthalate
RPS	Reusable packaging system
RQ	Research question
UK	United Kingdom
WTP	Willingness to pay

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1. Introduction

1.1. Context

The global environmental pollution that is caused by plastic is posing a threat to the ecosystems on our planet as well as the human health (Jambeck et al., 2015; Wright & Kelly, 2017). Most of the plastic production (40%) in the European Union (EU) is attributed to the production of plastic packaging. However, only 32% of the produced plastic is actually recycled instead of going to the landfill or being used for energy recovery (European Parliament, 2018). The generation of plastic waste in the EU is showing an upward trend with increasing amounts over the last 10 years (EuroStat, 2023). In Germany specifically, the data shows that the country is amongst the four strongest ones when it comes to recycling after consumption. Out of 3 163 thousand tons of plastic packaging that were produced in 2021, around 55% was recycled after usage (Plastics Europe, 2022). At the same time however, Germany is responsible for selling 25 615 million single-use plastic bottles in 2022, of which 167 million bottles were lost in the aquatic system (Oceana, 2023). Therefore, the pollution of the environment that stems from plastic waste is still a major concern (Wilts et al., 2016).

A lot of countries and companies have committed themselves to helping relieve the extensive issue of plastic waste generation (e.g. CocaCola Company, n.d.; Environment and Climate Change Canada, 2020; European Parliament, 2019). The manufacturers that have made these commitments focus their efforts on the overall reduction of single-use plastic. This can involve several different interpretations, spanning from minimizing overall packaging (such as providing goods without packaging) to decreasing reliance on plastic packaging (for example, replacing plastic with paper). Additionally, it involves cutting back on conventional plastic made from crude oil (via the adoption of bioplastics) and lessening the use of virgin plastic (through the substitution of virgin plastic with recycled alternatives) (Rhein & Sträter, 2021).

One way of reducing the amount of plastic waste is the concept of reusable containers made of durable material to be cleaned and reused multiple times. It was shown that an increase of 10% in implementing reusable packaging by 2030 can lead to a reduction of 1 trillion single-use plastic containers (Oceana, 2023). The platform “Loop” is one provider that has set their goal of fighting against the pollution of the environment (Loop, n.d.). The founder Tom Szaky views the concept of Loop as a convenient solution to address the root cause of waste by eliminating disposable packaging commonly caused in grocery store purchases. Rather than using single-use packaging, Loop members offer their products in reusable containers and charge a deposit

to incentivize consumers to return the empties. Loop then takes on the responsibility of cleaning these containers and returning them to brands for reuse (Cao, 2019).

1.2. Dissertation outline

The literature review begins with an industry analysis that presents the development of reusable packaging and examines its current status in the German market. The Loop platform is presented in detail and the entire process is explained. The preceding information ends with defining the research problem and the research questions. The section on trends in consumer behavior examines existing research on attitudes toward sustainability and acceptance of reusable packaging. This is the base for the formulation of hypotheses, which lay the foundation for the primary research that follows.

The methodology and data analysis section explains the research approach and the use of in-depth interviews and an online survey. The main qualitative findings from the in-depth interviews are presented, which are incorporated into the subsequent quantitative analysis. The revision of hypotheses based on the qualitative findings ensures a coherent research framework. The next section, which covers the design, sample characteristics, and methods of the online survey, ends with the important element of testing the hypotheses derived from the literature and the qualitative interviews.

The managerial implications chapter translates the research findings into actionable insights and strategic recommendations for industry players. It describes the key considerations for companies operating in the reusable packaging sector and provides guidance for a potential entry into the German market.

Finally, in reviewing the research, it identifies limitations and suggests avenues for future research in the dynamic field of sustainable packaging. The thesis concludes with a summary of the findings.

2. Literature Review

2.1. Industry Analysis

2.1.1. Development of reusable packaging

The nature of fast moving consumer goods (FMCG) products is single-use, which has the effect of creating a lot of waste because of their resulting short lifespan (Zeeuw van der Laan & Aurisicchio, 2019, p. 236). Due to various factors, including packaging design, inadequate infrastructure, and consumer behavior, the packaging of FMCG products is often incinerated or disposed of in landfills. This disposal of the packaging contributes to the pollution of air, water, and soil (Ellen McArthur Foundation, 2013b). Circular systems on the contrary are restorative or regenerative in nature. They aim to reduce waste through the use of better materials, products, systems, and overall business models (Ellen McArthur Foundation, 2013a).

In regard to packaging, reuse is one way of circular packaging design that aims to reduce waste. As early as 2004, the EU stipulated that packaging should be reusable, recyclable, or recoverable and set specific targets for member states to achieve in the following years (European Union, 2004). As of 2013, there is an international specification of what can be considered reusable with the following definition of reusable packaging: "packaging or packaging component which has been designed to accomplish or proves its ability to accomplish a minimum number of trips or rotations in a system for reuse"(ISO, 2013).

Over time, there have been different views in the literature on the different types of models in reusable packaging that can be used. Among them, Lofthouse et al. 2009 defined eight different models and later in 2019, the Ellen McArthur Foundation (EMF) proposed four different types which are often referred to. All of these models are differentiated in the kind of action the consumer has to take and the time and place of reusing and refilling (Ellen McArthur Foundation, 2019; Lofthouse et al., 2009). The four models proposed by the EMF are namely: *refill at home, refill on the go, return from home,* and *return on the go*. These are based on the two dimensions of "refill vs. return" and "at home vs. on the go"(Ellen McArthur Foundation, 2019).

Refill at home means that the consumers purchase a product and the appropriate reusable container for it. After using the product, they can purchase a refill unit of the same product either online or in traditional retail to refill their container at home. *Refill on the go* differs slightly in the process of refilling the reusable container. While the process starts off the same way for the consumer, they only have the option of refilling the container away from home,

meaning in traditional retail or public refill stations (e.g. water fountains). The *Return from home* concept involves a few more steps as it is an e-commerce model and therefore requires a delivery system. The user subscribes to the service and the product is then delivered to their home. After the product has been used, the empty packaging is collected by the supplier and exchanged for a new product. The used packaging is then cleaned by the provider and enters the cycle again. The *Return on the go* concept works similarly, except that it is designed for traditional retail. Instead of being delivered to the consumer's home, the consumer buys the product in reusable packaging, uses it, and then returns the empty packaging to a local collection point. There, the provider picks up the used packaging, cleans it, has it refilled, and returns it to the retailer to be purchased again (Ellen McArthur Foundation, 2019).

According to a forecast conducted by McKinsey & Company (2022), there are several barriers that these concepts face, mainly in the areas of cost, supply chain, acceptance, and food safety. As a result, they predict that reusable packaging will account for only 5 percent of the global packaging market by 2030 if the current trajectory does not change. It is also limited to a few segments that are ripe for further penetration: Beverages, food service, packaged food, home care, e-commerce packaging, and transportation packaging.

2.1.2. Reusable packaging in the German market

Since 2003, Germany has had a widespread deposit system for polyethylene terephthalate (PET) bottles for mineral water, beer, and carbonated soft drinks. The system has evolved over the years, resulting in the current standard of a 25-cent deposit that consumers receive back for every bottle they return for recycling. The system has been expanded over time to include other beverages and materials. Aluminum cans can now also be recycled at the same collection points as PET bottles (EinWeg mit Pfand, 2021). There is also a system in Germany that covers glass bottles which are mostly used for water or beer. The beverages are sold in bigger crates of 20 glass bottles which can be returned as a unit at a return point. The bottles are then cleaned, refilled, and resold again. This system also involves a deposit that the consumer must pay when purchasing the crate of bottles. It is usually around 8 to 15 cents per bottle and is refunded at the point of return (Arbeitskreis Mehrweg GbR, 2014)

In Germany, there are already policies in place that are having an impact on the use of single-use plastics. Being part of the European Union, a directive of the EU regarding the environmental impact of plastic products from 2019 applies in Germany. The directive states that certain single-use plastic products will be banned from the market. These include plastic

tableware and cutlery, plastic straws, and cotton buds. It also includes a section on the increased responsibility of manufacturers. They will be required to cover the costs of cleaning up and disposing of plastic waste. In addition, the directive calls for better and more informative labeling on packaging regarding optimal disposal and environmental impact. Finally, EU countries are required to take appropriate measures to ensure that single-use plastics are properly collected and disposed of (European Parliament, 2019).

A study of the German PET markets and the underlying processes in 2022 showed that the government needs to intervene to reach more circular plastic economies (Gothár & Schanz, 2022). As of January 2023, Germany has a law in place that regulates the use of reusable packaging in the food and beverage sector. Stores that sell food in single-use plastic packaging or single-use beverage cups must also offer the same products in reusable packaging. This reusable packaging is not allowed to be more expensive or inferior to the single-use packaging. Stores must post prominent signs at the point of sale informing customers that they can purchase products in reusable packaging. The obligation to take back reusable packaging applies only to those that were sold by the store themselves (Bundesministerium der Justiz, 2023).

Experts in Germany have stated that there are too few alternatives for German consumers to even be able to reduce their plastic waste. Therefore, many of the experts that were questioned suggested measures that could help to reduce plastic waste and one of them was a wider availability of reusable packaging on a broader scale than for example the beverage industry (Steinhorst & Beyerl, 2021). Another study that showed the effects of single-use plastic and the challenges in reducing it suggests that a change in consumer behavior, considerations of material efficiencies, and circular economy principles are required for an impactful change (Schmidt & Laner, 2021).

Due to the new law and the proven need for reusable packaging, there has been some development in the introduction of solutions in the German market. For example, in the food and beverage industry, as now required by law, there is a provider called "reCup" that has established itself. Their concept consists of a network of restaurants offering reusable cups or bowls produced by reCup. Customers can return the cup either at the same location or at any participating location. The cups are then washed and brought back into circulation by the reCup company. To date, they have a network of over 21,000 distribution and return points in Germany (reCup, n.d.). Another provider of reusable packaging in the food and beverage industry is “Vytal”. They have a range of differently shaped take-away packaging that is being

returned after use. They mainly work with restaurants that offer delivery or take-away services and provide them with their packaging. To date, they have 6,500 partners in Germany to whom they lend their packaging for use in return for a fee. The fee paid by the partners is the main source of income, apart from the €10 fine that consumers have to pay if they do not return the containers within 14 days (Vytal, n.d.).

2.1.3. Loop: the reusable packaging platform

In 2019, the launch of the platform called "Loop" was announced at the World Economic Forum in Davos. Led by the company TerraCycle, Loop is a platform for a reusable packaging system that is made up of a network of partners. Major FMCG manufacturers such as Unilever, Nestlé, Beiersdorf, P&G, and many others, as well as fast food chains such as Burger King and McDonald's, have joined the program with the goal of reducing plastic waste. Retailers are also part of the network, with Walmart, Tesco, Carrefour, and Metro helping to expand access to Loop products. To deliver its products to consumers, Loop has partnered with various operational partners to help with logistics such as packaging design and solutions, delivery services, and cleaning services (Loop, n.d.). With this network of partners in place, the platform is able to offer both a *Return from home* and a *Return on the go* model (Ellen McArthur Foundation, 2019). So far, Loop has been launched in the United States, France, Japan, and the United Kingdom (UK) (Loop, n.d.).

The way Loop works is that the consumers can buy the various products either in the partnering retail stores or on their online websites. In exchange for a deposit, the products come in their respective reusable packaging, which is designed to be especially durable and easy to clean. Once the consumer has used the product, they can return the packaging either by placing it in a collection bin at the retail store or by placing it in a reusable Loop tote that is picked up at the consumer's home (Loop, n.d.). As soon as the Loop system registers the used containers as returned, the consumer receives a refund of the deposit that they placed beforehand. This is all done through an app, and the amount of the deposit can vary between $0.10 and $10, depending on the type of container. The deposit is an incentive for consumers to return the packaging to ensure sustainable use (Loop Global Holdings LLC, 2023). Loop then cleans the packaging using their own specialized cleaning system for high standard hygiene and sends them back to the manufacturer who refills them with the product and brings them back into the cycle. Some products have recoverable parts, such as razors, diapers, or toothbrushes, which Loop also collects in order to recycle the material (Loop, n.d., 2019).

In an interview, the founder Tom Szaky explains that the initial idea of Loop was to eliminate the root cause of trash, as opposed to recycling, which is only a solution to the symptom of plastic waste (Disruptive Investing, 2021). The goal of Loop is to reduce the amount of single-use plastic waste and to create a long-term solution for a circular economy. Their system prevents the packaging from going to the landfill and prevents the pollution of the environment that comes with that. The model is supposed to be scaled in a way so that the Loop model is globally spread out, accessible to the masses across all product categories, and a user-friendly solution for consumers. The vision is to establish a circular economy that replaces the current normalcy of single-use plastic and instead offers a convenient customer experience that is better for the environment. At the same time, it is supposed to be a competitive and innovative business model for their partners (Loop, n.d.).

For manufacturers of FMCG products, a partnership with Loop means that they must provide much less packaging overall and can instead reuse the containers that they receive back. However, they are responsible for financing the cleaning process, which causes a change in their pricing structure. Before, the price for a single-use plastic packaged product would have contained the material cost of the packaging, as the consumer essentially gets to keep it. With the reusable containers however, the consumer is encouraged to return them and therefore the cost of a consumer using the packaging is charged additionally to the cost of cleaning (Disruptive Investing, 2021).

Based on the compiled information about Loop and other systems that have been established in Germany, there are noticeable differences that make Loop stand out in comparison. Unlike the PET and aluminum recycling systems, Loop provides waste prevention instead of trying to reuse what has already been discarded. This way, the use of Loop has less impact on the environment. Compared to the recycling system in Germany, Loop is a broader platform that goes beyond beverage packaging. However, one thing they have in common is the concept of paying a deposit that consumers can only get back if they return the containers properly. The same concept applies to the reusable containers offered by reCup. Vytal is an example of a reusable packaging supplier that does not operate with a deposit. The difference between reCup and Vytal compared to Loop is that their concept focuses exclusively on to-go products such as beverages and meals. Here, too, Loop can offer a broader range of products than what exists. A consequence of this is that the return points for Loop offer a more convenient solution as it gathers a multitude of containers from different kinds of products and brands. Another distinguishing feature of Loop is that the platform is mainly an online business, as the

navigation of the process takes place through a mobile application. However, Loop's concept also ensures that the purchasing process itself can take place both online and stationary, which covers a broader mass of consumers.

2.1.4. Problem statement

Even though consumers have been found to be willing to pay more for sustainable packaging alternatives, they also represent the biggest hindrance to adoption in many cases as they are unwilling to change their consumption behavior (Gong et al., 2020; Ma et al., 2020; Walker et al., 2021). So far, the most sustainable alternatives are offered within the food and beverage industry. In Germany, this stems mostly from regulations regarding the use of single-use plastics (Bundesministerium der Justiz, 2023). To increase the availability of alternatives to single-use plastic packaging, a reusable packaging system such as Loop is an option for the German market. It covers different categories and offers two different models of returning packaging for a circular economy (Loop, n.d.). The research aims to find out the general attitude of German consumers towards the introduction of a reusable packaging system like Loop. The research questions (RQ) posed about the adoption in the German market are:

RQ 1: What are the drivers for German consumers to use a reusable packaging system like Loop?

RQ 2: What would the profile of the consumer look like who is most likely to use a reusable packaging system like Loop?

RQ 3: What are the barriers for the adoption of a reusable packaging system amongst the German consumers?

By answering these questions, it can be determined whether the Loop system will be accepted by German consumers and which factors supports the adoption process. In addition, the target group and barriers will be studied to make the adoption process more successful.

2.2. Reusable Packaging - Consumer Behavior Trends

To date, several studies have been conducted on consumer attitudes towards reusable packaging, the willingness to engage in reducing plastic packaging, and the barriers that might pose issues to adoption.

A study of the motivations and influencing factors on green consumption has shown that the status of a consumer plays an important role in inducing pro-environmental behavior.

Activating a status-related motive in the consumer will make it more likely for them to choose the green option (Griskevicius et al., 2010). There are also other influencing factors on the recycling behavior of consumers that have been researched. It has been shown that offering incentives and introducing frequent information-based interventions to motivate consumers are an effective way to promote recycling (Iyer & Kashyap, 2007). The overall perception of environmentally friendly plastic alternatives has been explored in various studies. The results show that there is generally a positive perception of the sustainability aspect of plastic alternatives, particularly bio-plastic (Herbes et al., 2018; Taufik et al., 2020; Wensing et al., 2020). One specific study focused on the concept of returnable, reusable containers and found that the positive environmental impact was a main driver for the positive attitude towards the system (Bocken et al., 2022). A study on reusable packaging of an online meal-kit provider also proves that it is perceived as positive (Yoon et al., 2022). In the area of food packaging, research shows that the higher the perceived environmental friendliness, the more likely consumers are to purchase a product (Macht et al., 2023). Knowing the **importance of sustainability** to consumers and the increasing awareness of it, the following hypothesis (H) can be made to address the RQ1:

> H1.1: A main driver of the German consumers to use a system like Loop is their attitude towards sustainability

Research was conducted on the willingness to adopt recycling and other ways to reduce plastic packaging. Overall, high levels of willingness have been found, for example, in the UK, the Netherlands, and the German market (Greenwood et al., 2021; Miao et al., 2023; Siddiqui et al., 2023). Looking at the different ways to reuse packaging, the UK consumers showed a higher willingness to refill packaging than to return it. However, it was also found that people are more likely to participate in systems they are already familiar with. In the UK, this would not apply to the return of packaging, but rather to the recycling of materials (Greenwood et al., 2021). With this information of the overall positive attitude of consumers toward reducing plastic waste and the link to **familiarity with a system**, another hypothesis to answer RQ1 is the following:

> H1.2: German consumers are more likely to have a positive attitude towards a system like Loop, because they frequently engage in the existing return system for empty packaging

A study in Germany looked in detail at the influencing factors when it comes to reducing their use of plastic packaging. It showed that environmental attitudes have a significant impact on concern about plastic waste and the resulting motivation to reduce plastic consumption. Other factors (e.g. age and gender or social norms) only had a significant impact on behavior when the product category was examined in detail (Siddiqui et al., 2023). By studying the influencing factors for recycling specifically, it was shown that addressing female consumers might have more of an effect on these measures since they are proven to be more concerned with the topic of environmental friendliness (Iyer & Kashyap, 2007). Overall, various studies show that women are moderately more concerned about the environment than men (Dhenge et al., 2022; McCright & Sundström, 2013; McCright & Xiao, 2014). These **influencing factors** on the behavior of consumers lead to this hypothesis which relates to the RQ2:

> H2.1: The highest likeliness to use Loop occurs amongst female consumers who are concerned about the pollution of the environment

A closer look at the research conducted specifically on the use of reusable packaging systems (RPS) reveals that while there is a positive perception, there are also concerns about the use of these systems (Long et al., 2022; Miao et al., 2023). One big concern is the contamination of the packaging in terms of hygiene, territorial contamination, and utility contamination. Hygiene concerns can be triggered by sensitivity to disgust, territorial issues arise when there are marks of strangers using the same containers, and if the packaging has severe scratches, it can cause the perception of utility contamination. When contamination is perceived by consumers, their intentions to engage in reuse decrease or it leads to early replacement of the packaging, which counteracts the sustainability (Miao et al., 2023). The hygiene aspect overall poses an issue in the adoption of RPSs. It is perceived as a critical factor especially when it comes to food (Long et al., 2022). A closer investigation of the hesitation to reuse containers showed that there are many factors influencing the threshold at which consumers decide that it is not acceptable anymore to reuse a container. Contextual factors like the initial cleanliness of the container, individual sensitivity of feeling disgust, or other individual perspectives on the packaging can affect the willingness to reuse significantly (Baird et al., 2022). These findings on **contamination and hygiene** lead to the following hypothesis in response to RQ3:

> H3.1: A significant barrier to use Loop is the lacking trust of German consumers into the hygiene of the containers

Other factors may also influence the acceptance of RPS, and it was found that cost is a concern for many consumers. When adopting new systems, consumers tend to be cautious about the financial risk they take, which includes not only the price itself but also possible refund options (Long et al., 2022; Miao et al., 2023). Consumers also highlighted pricing as a barrier in another study in Germany as well and emphasized that financial incentives could help with the initial adoption (Bocken et al., 2022). However, a further study of German consumers was conducted to find out more about the willingness to pay (WTP) for plastic alternatives. The group was a relatively young and eco-conscious group that showed a positive WTP for recycling plastic, paper, and unpackaged goods. The positive WTP was influenced by their perception of the degree of sustainability of these packaging alternatives (Herrmann et al., 2022). Based on this ambiguous information about **cost and WTP**, the following hypotheses are tested regarding RQ1 and RQ3:

> H1.3: German consumers are willing to pay a deposit for the reusable containers because of the perceived environmental benefit

> H1.4: German consumers are willing to pay a price premium for the reusable containers because of the perceived environmental benefit

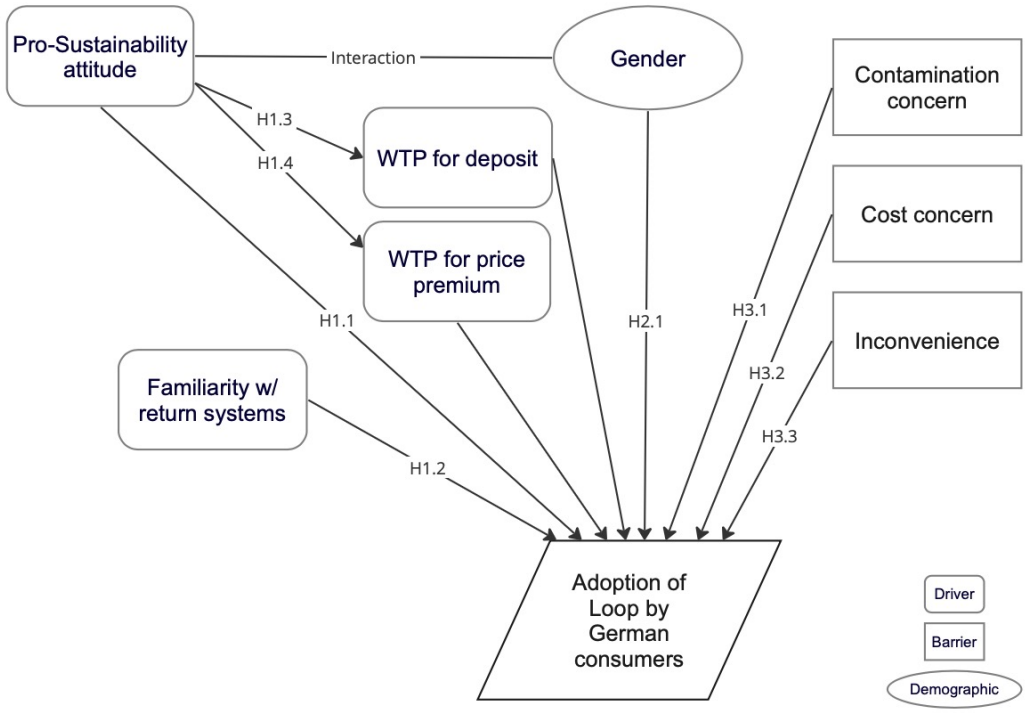
> H3.2: The higher cost caused by the deposit system of Loop is a concern in the adoption of German consumers

What was also shown is that the usability and convenience of the new system play a significant role in adoption. If consumers cannot easily incorporate the RPS in their routine, they are less likely to use it (Long et al., 2022; Miao et al., 2023). This aspect of convenience was also highlighted in a study of a circular return system in Germany. Consumers made it clear that the whole process of such a system must be easily integrated into their daily lives for them to use it. This requires that it is also easy to understand (Bocken et al., 2022). This information poses another hypothesis about **inconvenience** being one barrier to adoption:

> H3.3: The perception of inconvenience of the Loop system poses a barrier for the German consumers to adopt it

Finally, as a basis for the following research that will be conducted, this conceptual framework is proposed, representing the resulting hypotheses of the literature review:

Figure 1: Conceptual Framework after literature review



Source: Own representation

3. Methodology and Data Analysis

3.1. Research Approach

This study follows a hybrid research approach including both qualitative and quantitative research. The qualitative part consists of in-depth interviews with the aim of validating the drivers and barriers to the adoption of Loop that were identified in the literature review. In addition, the interviews are intended to uncover any additional influencing factors that come into play for German consumers when considering the use of a RPS such as Loop. The findings will be used to adapt the hypotheses formulated and/or to formulate new hypotheses. The selected hypotheses will then be tested for their validity in the German market in the quantitative part, where an online survey will be conducted with German consumers. The aim is to identify and generalize drivers and barriers for the adoption of Loop as well as a profile of the most likely users of the platform. These findings will help to determine the appropriate approach for Loop in the German market, and managerial implications for entering the German market can be determined.

3.2. In-depth interviews

3.2.1. Sample and data collection

Since this work focuses on the implementation of the Loop system in Germany, the interviewees were intentionally all German. A total of 10 interviews were conducted over four days (November 16th – 20th, 2023). To ensure balanced results, both genders are almost equally represented in the sample, with six female respondents and four male respondents. The participants' ages ranged from 21 to 67 years old, to get different perspectives from people in different professions and at different stages of life.

In order to collect as many different opinions and perceptions as possible, semi-structured interviews were chosen as the tool for the qualitative part of this work. Due to the physical distance, the interviews could not be conducted in person. Instead, the interviews took place in online video sessions. Each interview took around 25-35 minutes. The interviews were recorded and summarized as can be seen in Appendix 1.

3.2.2. Results

Overall, the interviewees unanimously recognize the importance of sustainability and reducing plastic waste, while also highlighting challenges such as limited alternatives and higher costs for sustainable options. Despite varying levels of personal commitment, they express awareness of their environmental impact and call for more effective efforts. They already take a variety of

actions, including recycling, using reusable items, and avoiding plastic packaging. Respondents' green purchasing includes a preference for glass packaging, avoiding certain ingredients, and choosing sustainable alternatives to plastic. These responses show a collective concern for sustainability and a commitment to making environmentally conscious choices.

The respondents are generally familiar with existing return systems, actively participating in deposit systems for glass and plastic bottles and some use reusable systems such as reCup and reBowl. Reasons for participation include environmental protection, litter prevention, and the financial incentive of the deposit. While environmental benefits, resource conservation, and reward effects are named as benefits, the participants point to concerns such as the initial cost of the deposit, the inconvenience of return locations, and the need for broad participation for true sustainability. Overall, there is a consensus on the positive impact of redemption schemes, albeit with some acknowledged drawbacks.

The interviewees generally express positive initial impressions of the Loop concept when presented with a version without the deposit. They find it useful, practical, and interesting. However, they also express concerns and doubts. Some are concerned about the durability and reusability of the containers, possible difficulties in introducing and accepting the system, and logistical challenges. Some questions were raised about the cost, convenience, and overall sustainability of the process. Despite these reservations, many participants could see themselves participating in Loop. When introduced to the idea of paying a deposit for containers, participants had mixed impressions. In general, the concept of paying a refundable deposit was seen as a logical and acceptable aspect. However, some participants expressed concern about the amount of the deposit, as higher amounts are a potential barrier to participation. It was stressed that the amount should be reasonable in relation to the size and make of the container. Regarding pricing, there was a consensus that reusable packaging could be slightly more expensive than single-use plastic, but opinions differed on the willingness to pay such a price premium. Most of the respondents would accept a small price premium because they value the sustainability aspect, but there are clear limits for most when it comes to pricing. Income was cited as an important factor influencing participants' willingness to pay, with some acknowledging that they would be more open to the idea if they had a higher income.

The participants had varying levels of confidence in the hygiene and safety of Loop's reusable containers, naming factors such as transparency of the process, compliance with regulations, and the appearance of the packaging as deciding factors. Hygiene concerns were more

important for certain products, leading them to prefer to buy dry or long-life products in reusable containers. Opinions were divided on convenience: some found the process convenient, especially when available online, while others pointed out the potential inconvenience, especially for households dealing with large quantities of containers. Despite these considerations, many participants were open to integrating Loop into their daily routines, depending on factors such as general availability and convenience. It became clear that different factors related to hygiene and convenience influenced consumers' attitudes towards Loop.

3.3. Hypotheses revision

In most cases, the results derived from the qualitative interviews support the hypotheses that were formulated based on the research found in the literature. In some cases, a difference in consumer attitudes can be seen, which makes it especially relevant to test the hypotheses quantitatively through a survey. However, for most of the hypotheses, a certain tendency in the results can already be identified. Therefore, the following hypotheses will be kept as they were previously formulated:

H1.1: A main driver of the German consumers to use a system like Loop is their attitude towards sustainability

H1.2: German consumers are more likely to have a positive attitude towards a system like Loop, because they frequently engage in the existing return system for empty packaging

H1.3: German consumers are willing to pay a deposit for the reusable containers because of the perceived environmental benefit

H1.4: German consumers are willing to pay a price premium for the reusable containers because of the perceived environmental benefit

H3.1: A significant barrier to use Loop is the lacking trust of German consumers into the hygiene of the containers

H3.2: The higher cost caused by the deposit system of Loop is a concern in the adoption of German consumers

H3.3: The perception of inconvenience of the Loop system poses a barrier for the German consumers to adopt it

One hypothesis that was not addressed and therefore cannot be judged at this point, is H2.1 concerning the gender of the favorable consumers. This may be identifiable in the quantitative research.

> H2.1: The highest likeliness to use Loop occurs amongst female consumers who are concerned about the pollution of the environment

Based on the information gained from the interviews, two additional hypotheses can be formed regarding the barriers to adoption. The first one is based on the statements that the participants made on their evaluation of how they think their income influences their personal willingness to pay:

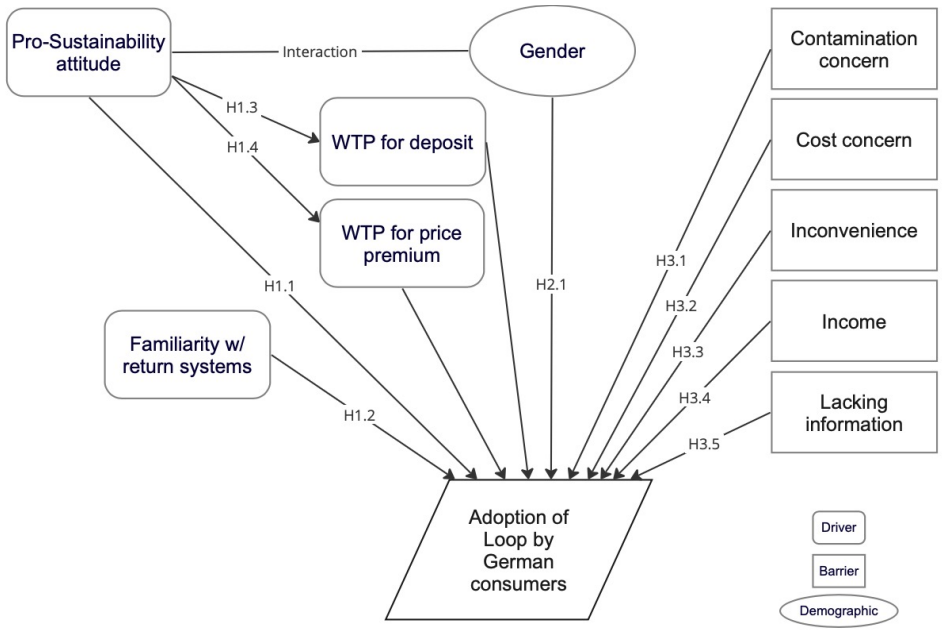
> H3.4: The willingness to pay for products within the Loop system is negatively influenced by the income level of German consumers

The second new hypothesis stems from the fact that a lot of the interviewees were making statements that were formulated as assumptions or they directly stated that they require a lot of transparency and information to adopt Loop:

> H3.5: Lacking information about the process of Loop holds German consumers back in their likelihood to use Loop

After revising the hypotheses, the conceptual framework that was proposed before is adapted to the following version:

Figure 2: Conceptual Framework after in-depth interviews



Source: Own representation

3.4. Online survey

3.4.1. Design and sample

To reach quantifiable results, an online survey was created in the next step of this research[1]. After conducting a small pre-test amongst 10 people, the survey was altered slightly to make it more user-friendly and then launched via Qualtrics XM. The survey was distributed through various channels, including the personal network, social media, and a survey exchange group. Within the four days that the survey was available (November 24th - 27th, 2023), a total of 143 respondents completed the survey. As 7 people did not qualify, because they do not live in Germany, they were removed from the data set and 136 responses were left to be analyzed.

The questions in the survey are directed to reach a clear result regarding each hypothesis that has been formulated up to this point. In total, there are 17 questions, though some questions contain a multitude of statements that had to be evaluated, resulting in a total of 43 variables. The screening question for the survey was whether the respondents are living in Germany, as that is the focus market of this study. Starting, the first block of questions was directed toward the general attitude toward sustainability of the consumer. This is aimed at finding out how their overall attitude can be related to the following answers regarding the Loop concept. Following that, the next questions covered the familiarity with return systems that already exist in Germany. The purpose of this is mainly to later look at a possible correlation between the familiarity with return systems and the consumers' attitude towards Loop. Then, an introduction to the concept of Loop was shown, including pictures that should help to form an image of Loop in the heads of the consumers. Based on that information, the next block of questions covered the overall attitude towards the concept, the perception of hygiene and convenience as well as the willingness to pay. All of these factors are to be analyzed in a context with the previous topics covered in the survey. Lastly, the survey finished with several questions regarding the demographics of the respondents.

3.4.2. Data analysis

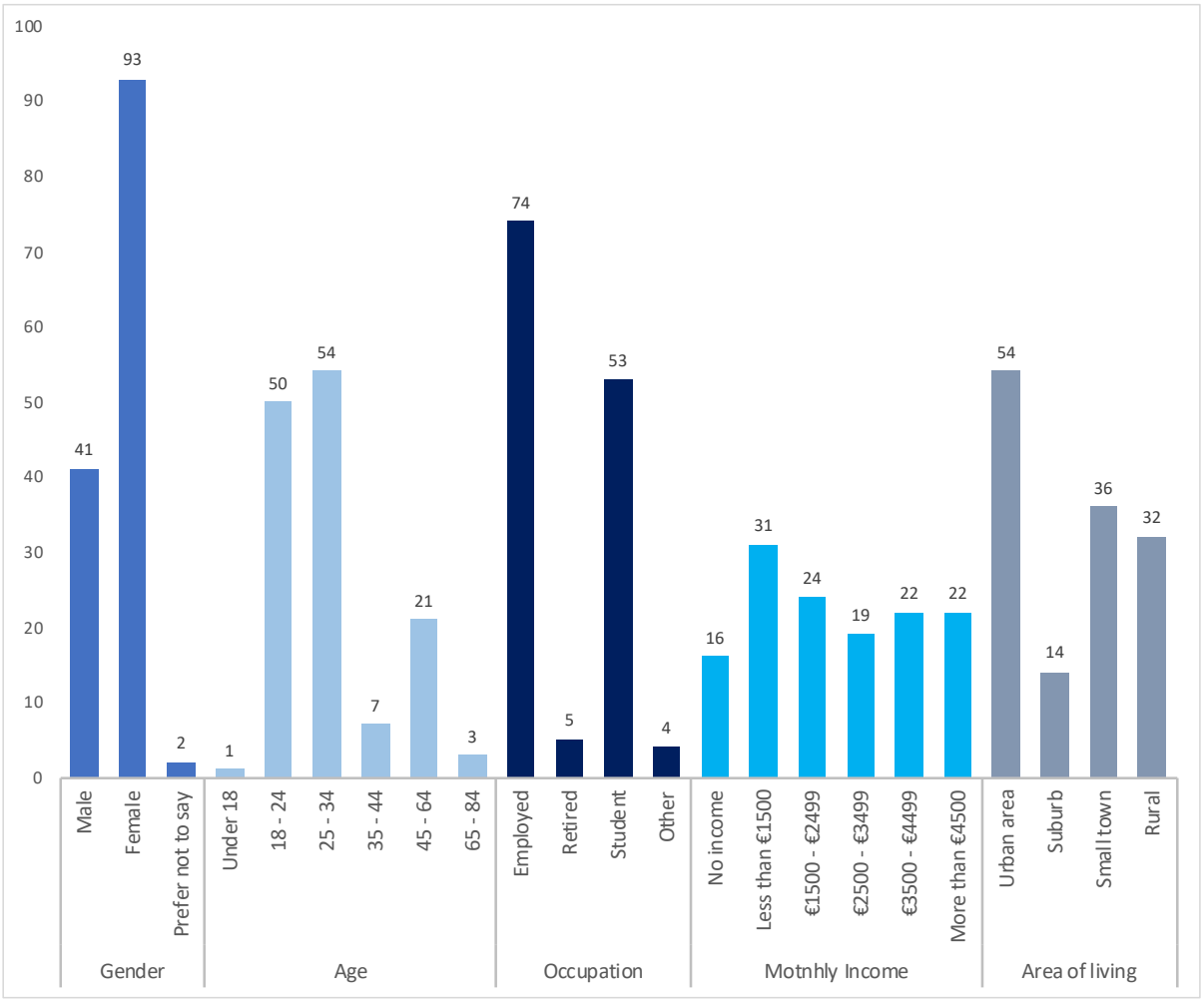
3.4.2.1. Sample

Firstly, an overview of the demographic makeup of the sample can be given. The sample consists of 68% (N=93) female respondents, 30% (N=41) male respondents, and finally 1.5% (N=2) who prefer not to state their gender. The age of the respondents mainly fell into the ranges Under 18, 18-24, and 25-34 with cumulatively 77% of the participants belonging into that range up to 34. Amongst the remaining respondents, the most represented age group was 45-64 with

[1] Full questionnaire in Appendix 2

15% of total answers. The majority of respondents are either studying (39%) or employed (54%) and only 4% are retired. The distribution of the income ranges is made up relatively equal. The biggest part with 23% falls into the range of under 1500€ gross income per month, followed by the range of 1500€-2499€. The least number of participants do not have income at all (12%). Lastly, the data shows that most of the sample lives in an urban area (40%), followed by small town (27%) and rural area (24%) which account for a similarly large share of participants. The whole demographic makeup of the sample can be seen in this chart:

Figure 3: Demographic makeup of the survey sample



Source: Own representation

3.4.2.2. Descriptive analysis

To get an initial overview of the outcome, the descriptive statistics of each question can be analyzed[2].

In the first block, concerning the attitude toward sustainability, respondents show a high level of environmental awareness. 93% of respondents agree either strongly or moderately about their general environmental awareness. Over 70% believe that plastic waste is a major environmental problem. Remarkably, most respondents are already adopting sustainable practices and intend to make environmentally friendly choices in the future.

The next part examined the familiarity with return systems including the involvement of deposits. It revealed that 93% of German consumers are already familiar with the concept of returning empty packaging. The frequency of use shows that 95% of respondents return their empty packaging every 2-4 months or more often. The most used system is the PET plastic bottle system, which 90% of the participants use more than every 2-4 months. It is followed by singular glass bottles and then the return system for glass bottles in crates, while newer systems such as reCup and Vytal are used less frequently. The main reasons for returning packaging are waste prevention (42%) and the return deposit (38%).

After being presented with the information about Loop, cumulatively 76% of respondents are either somewhat or extremely likely to use the system, painting an overall positive picture. It is noticeable that 89% of the consumers agreed that they have a positive feeling toward Loop. The majority (N=74) stated that they would be somewhat willing to pay a deposit for each container they buy. A similar value (N=71) is somewhat agreeing that the pricing is a significant factor in their consideration for Loop. When asked directly whether they would pay more for a product in reusable packaging, there is a mixed picture. Cumulatively 19% would not necessarily be willing to pay more, 24% are unsure and a total of 57% would be willing to pay more. A positive attitude shows when asked about the possible usage of Loop on a regular basis. 81% of the participants would either somewhat or strongly agree with that statement. In total, 90% of the respondents showed at least somewhat agreement about Loop being a convenient solution against plastic waste. Only 3% of the participants stated that they had little to no trust in the hygiene of the reusable containers. The remaining responses have a clear tendency towards agreement. This is in line with the question of whether it is off-putting that other people had used the same container before them. The majority with 72% would somewhat or strongly

[2] Only the most important statistics will be highlighted for capacity reasons.

disagree. Rather few respondents show doubt about the positive environmental impact that Loop has. Cumulatively 62% at least somewhat disagree about having doubts and 21% would neither agree nor disagree. And lastly, when asked whether the respondents still have a lot of questions about the process and impact of Loop, the values do not go into the extremes a lot. There is a similar number of respondents for somewhat agree (35%), neither agree nor disagree (41%), and somewhat disagree (28%).

In the next block of questions, the perception of Loop was examined further. The price expectations are rather high, with a sum of 48% leaning toward expensive. However, the impact on the environment is perceived as overwhelmingly positive (93%). While a total of 47% find Loop practical, 34% do not state a clear tendency. Lastly, Loop is perceived as rather hygienic. In sum, 67% would lean towards hygienic.

To put the influencing factors in relation, they had to be ranked by the respondents next. Respondents rank sustainability as the top priority (N=51) most often, followed by convenience (N=38). The aspect that was chosen most often as least important is hygiene with 50% of respondents ranking it last. Also, not as important is the aspect of the deposit amount: it was named most often in fourth place (27%) and also in fifth place by 26%. The price therefore falls in the middle of priorities.

Finally, respondents were asked to rate their willingness to pay, both for the deposit and for a possible price premium. Regarding the maximum deposit amount, 56% of respondents would be willing to pay more than 2€ as a deposit. But above that, only 9% of all respondents would pay more than 5€, which means that the majority of answers are in the range up to 5€. The maximum of 10€ would only be paid by 4% of consumers. For the price premium, there are already 17% who are not willing to pay more at all. The question was based on a disposable product that costs 5€. Based on this, 15% of consumers chose the value of 0.50€ that they are willing to pay more for Loop. The most mentioned value was 1€ as a price premium, named by 22%. Higher than that, only 35% of all respondents would be willing to pay more than 1€.

3.4.2.3. Factor analysis

As there are multiple questions in the survey that are made up of multiple items that were evaluated, aiming at similar topics, a factor analysis was performed. The factor analysis will show underlying factors that reveal patterns in the data, leading to a more concise interpretation of future analyses.

In this case, the survey included one multi-item question (Question 8) that covered statements that were all aimed at the perception of Loop. There was a total of ten statements, which could possibly be condensed into fewer factors. Therefore, a first run of the factor analysis based on the Eigenvalue was conducted. Firstly, the Correlation Matrix showed that a few variables have a high positive or negative correlation, suggesting that they can form a factor. The Kaiser-Meyer-Olkin test (KMO) and Bartlett's Test gave a value of 0.754 for the KMO, indicating that this analysis is appropriate for these variables and a p-value (ρ) < 0.001 in the Bartlett's Test of Sphericity, which is below the conventional significance level of 0.05, making the model statistically significant. However, this model based on Eigenvalue suggests that four factors should be formed before the Eigenvalue falls below the value 1.0. These four factors would explain only 72% of the total variance, which led to the decision to include more factors, to reach at least 85% of variance explained. Therefore, another factor analysis was run with a given number of six factors. This model results in the Rotated Component Matrix, which leads to the identification of the underlying factors. In this case, the six factors can be recognized as the following[3]:

1- "Positive perception": Positive feeling + can imagine using Loop regularly + convenient solution
2- "Hygiene concern": Little trust in hygiene + high worry about other people using container
3- "Willing to pay deposit": High willingness to pay a deposit
4- "Trusting investment": Willing to pay price premium + No doubts about the positive environmental impact
5- "Open questions": Still has a lot of questions
6- "Pricing is significant": Pricing is a significant factor in using Loop

For the following analysis, it is important to mention that using the factors only leads to more insightful results in some cases, not all. The original variables will still be used if deemed necessary, to make sure the test is as specific as possible. This is especially the case for the factors that do not necessarily show high values for multiple variables in the Rotated Component Matrix.

[3] SPSS output in Appendix 3

3.4.2.4. Hypotheses testing

H1.1: A main driver of the German consumers to use a system like Loop is their attitude towards sustainability

In testing the hypothesis, a linear regression between sustainability attitude[4] and usage likelihood of Loop is the first step. The $\rho < 0.001$ deems the regression as statistically significant and judging from the R Squared value, the variables explain 17.3% of the variance in the likelihood of using Loop. Only two of the tested variables show statistical significance: viewing plastic waste as an important problem and intending to adopt sustainable practices significantly influence the likelihood of using Loop, with the former having a slightly stronger effect ($\beta = 0.240$).

A further regression, with the independent variables being the perception of Loop[5] and the dependent variable being the likelihood to use Loop, was performed. Firstly, this regression was again shown to be statistically significant based on $\rho < 0.001$ and explains 16.4% of the variance of the dependent variable. Of the four variables, two have a significant impact. In particular, the perception that Loop is environmentally friendly has a significant impact ($\beta = -0.243$)[6], indicating that consumers who perceive Loop as environmentally friendly are more likely to use the system.[7] This, combined with the result of the previous regression, supports this hypothesis.

H1.2: German consumers are more likely to have a positive attitude towards a system like Loop, because they frequently engage in the existing return system for empty packaging

This hypothesis is tested with a regression of the variables familiarity with return systems[8] and frequency of usage[9] and their influence on the created factor "positive perception". The model is statistically significant ($\rho = 0.003$), however only explains a variance in the positive perception of 8%. The familiarity with the concept has a significant influence on the positive attitude towards Loop ($\beta = 0.292$), however the frequency of usage does not ($\rho = 0.482$).[10] Based on this information, the hypothesis is partly supported.

[4] All variables from Question 2 in survey. See Appendix 2
[5] All variables from Question 9 in survey. See Appendix 2
[6] The scale of this variable is inverted, leading to the negative coefficient.
[7] SPSS output in Appendix 4
[8] Question 3 in survey. See Appendix 2
[9] Question 4 in survey. See Appendix 2
[10] SPSS output in Appendix 5

H1.3: German consumers are willing to pay a deposit for the reusable containers because of the perceived environmental benefit

To test this hypothesis, a linear regression was run with multiple independent variables regarding the attitude and perception of sustainability[11] and the dependent variable WTP the deposit[12]. Even though the model is significant ($\rho < 0.001$) and explains 18.4% of the variance, there is only one variable that has a significant impact on the agreement on the WTP to pay a deposit: the concern about plastic waste for the environment ($\beta = 0.313$). Therefore, another regression was performed to test whether ranking the importance of sustainability in using Loop[13] highly has a significant influence on the WTP. This is again significant ($\rho < 0.001$) and explains 24% of the variance in the WTP of the deposit. The variable has a significant influence on the WTP ($\beta = -0.490$)[14], meaning that consumers who value sustainability more in the adoption of Loop, are more likely to be willing to pay a deposit.

Since the respondents also evaluated the exact amount of the deposit they would be willing to pay, a regression was performed with the same independent variables as before. This model explains 18.1% of the variance of the WTP of the deposit and is statistically significant ($\rho <0.001$). Out of the tested variables, two show a ρ of below 0.05: ranking sustainability as a top priority in adopting Loop ($\beta = -0.301$) and the perception of plastic waste as an issue for the environment ($\beta = 0.259$).[15]

These results show that consumers who are concerned with the sustainability effect of Loop are more willing to pay the deposit and also a higher amount of the deposit. Therefore, the hypothesis is supported by these tests.

H1.4: German consumers are willing to pay a price premium for the reusable containers because of the perceived environmental benefit

The same process as before for the WTP of the deposit was repeated for the WTP of a price premium. When testing the perception and attitude of sustainability[16] for their impact on the WTP, the model shows a significance ($\rho < 0.001$) and it explains 24.5% of the variance in the WTP. However, of the various variables, only one is statistically significant ($\rho = 0.028$), which

[11] Questions 2 and 9_2 in survey. See Appendix 2
[12] Question 8_2 in survey. See Appendix 2
[13] Question 10_4 in survey. See Appendix 2
[14] The scale of this variable is inverted, leading to the negative coefficient.
[15] SPSS output in Appendix 6
[16] Questions 2 and 9_2 in survey. See Appendix 2

is the evaluation of Loop as good for the environment (β = -0.179)[17]. Meaning, that the better the perception of Loop in regard to sustainability is, the more the consumer would say they are willing to pay a price premium. Again, it was also tested whether the importance of sustainability in the adoption of Loop[18] influences the WTP. This shows statistical significance and the one variable explains 21.3% of the variance. It has a β of – 0.462, which means that the influence is relatively strong.

All of the above-mentioned variables were also taken into a regression with the maximum price premium consumers are willing to pay as the dependent variable. It too is a significant model and the R Squared of this model is 19.8%. The only significant variable that influences the amount is the high ranking of sustainability in importance when deciding to adopt Loop (β = -0.242). This shows as well that the prioritization of sustainability leads to a higher amount that consumers are willing to pay for Loop.[19]

Therefore, this hypothesis can also be supported statistically.

H2.1: The highest likeliness to use Loop occurs amongst female consumers who are concerned about the pollution of the environment

In the first step, the influence of gender on the likelihood of using Loop was tested in a one-way ANOVA. However, the ANOVA shows a ρ of 0.210, which means that the null hypothesis of no difference between the means cannot be rejected. This is in line with the ρ of the Test of Homogeneity of Variances, which is below 0.05, rejecting it. This leads to the first insight that gender by itself does not influence the likelihood of using Loop.

In the next step, the variable of concern about the pollution of the environment[20] was added in an Analysis of Covariance (ANCOVA). This leads to the result that only the concern about plastic waste by itself has an impact on the likelihood of using Loop, but not the interaction with gender.[21] These tests lead to the rejection of the hypothesis.

[17] The scale of this variable is inverted, leading to the negative coefficient.
[18] Question 10_4 in survey. See Appendix 2
[19] SPSS output in Appendix 7
[20] Question 2_3 in survey. See Appendix 2
[21] SPSS output in Appendix 8

H3.1: A significant barrier to use Loop is the lacking trust of German consumers into the hygiene of the containers

A regression with all the variables concerning hygiene[22] and the likelihood to use Loop shows that this is a significant model ($\rho = 0.001$) and explains 12.8% of the variance in the likelihood to use Loop. The two significant variables that have a significant influence are the agreement that the consumers trust the containers to be clean ($\beta = 0.261$) and the ranking of hygiene as an important factor when adopting Loop ($\beta = -0.194$) [23].[24] This by itself shows that the hygiene aspect and the perception of it has an influence on the adoption to use Loop. Conversely, the conclusion is that a lack of trust in hygiene and a high concern for hygiene lead to a lower likelihood of using Loop. However, it must be noted that although there is a significant influence, in practicality, this might not be relevant. Looking at the Frequencies of these variables again, only 3% of the questioned consumers would not trust the hygiene of Loop and hygiene was only rated as 1st priority by 4% of the respondents. Therefore, even though the hypothesis is statistically supported, the practical implication may be limited by the low frequency of naming this barrier.

H3.2: The higher cost caused by the deposit system of Loop is a concern in the adoption of German consumers

This hypothesis was tested by finding out whether there is a relationship between the overall willingness to pay a deposit and the likelihood of using Loop. The test is significant with a $\rho < 0.001$ and the R Square of 24.5%. The agreement to the fact that consumers are willing to pay a deposit has a significant influence on their willingness to adopt Loop ($\beta = 0.495$). This shows the strong impact of the deposit and consequently means that respondents who are not willing to pay a deposit, are less likely to use Loop.

To verify this result, another regression was performed with the independent variable of the maximum amount of the deposit consumers are willing to pay. The analysis shows a statistical significance ($\rho = 0.02$), however, only explains 4% of the variance in the likelihood of using Loop. The maximum deposit amount has the β of 0.199, meaning the higher the deposit they are willing to pay, the likelier consumers are to use Loop.[25] When these results are related to the hypothesis, it can be supported statistically. However, it should be noted, that the

[22] Question 8_7,8_8, 9_4, 10_5 in survey. See Appendix 2
[23] The scale of this variable is inverted, leading to the negative coefficient.
[24] SPSS output in Appendix 9
[25] SPSS output in Appendix 10

respondents' willingness to pay in this case is used as a proxy for their acceptance and conversely for their concern about the cost.

H3.3: The perception of inconvenience of the Loop system poses a barrier for the German consumers to adopt it

To test this hypothesis, the various variables addressing convenience[26] were taken as independent variables in a linear regression and tested for their influence on the likelihood of using Loop. This model is statistically significant ($\rho < 0.001$) and explains 38.6% of the variance in the dependent variable. However, out of the tested variables, only one has a statistically significant impact on the likelihood of using Loop: the agreement that respondents could imagine using Loop regularly ($\beta = 0.526$). This variable does not directly address convenience, but it still covers the topic by addressing the fit for daily life. Additionally, seeing as the other variables contribute to the overall model fit, it shows that convenience does affect the likelihood of using Loop.[27] This test shows that the perception of inconvenience for daily life will lead to a lower likelihood of using Loop. These results cannot lead to full support of the hypothesis though, instead it is only partial supported.

H3.4: The willingness to pay for products within the Loop system is negatively influenced by the income level of German consumers

A one-way ANOVA with the independent variable of income level and the dependent variable of the agreement to be willing to pay a price premium was performed to test this. It shows that even though the assumption of equal means is not being violated, the ANOVA has no statistical significance ($\rho = 0.979$), which is also supported by the ρ of the Welch test ($= 0.975$). Therefore, there is no difference between the means of the different income levels, showing that it does not influence the willingness to pay. To check this, another ANOVA was conducted, but with the specific amount that respondents entered, they would be willing to pay more. This shows very similar results: the homogeneity of variances is not violated, however, the ANOVA and Welch test show no significance. This proves that depending on the income level, the different groups did not enter significantly different means.[28] Therefore, the hypothesis is rejected.

[26] Question 8_5, 8_6, 9_3, 10_1 in survey. See Appendix 2
[27] SPSS output in Appendix 11
[28] SPSS output in Appendix 12

H3.5: Lacking information about the process of Loop holds German consumers back in their likelihood to use Loop

A linear regression was performed to test this hypothesis. The independent variable is the agreement to having a lot of open questions about Loop and the dependent variable is the likelihood of using Loop. The ρ of 0.598 deems the model insignificant, which leads to the conclusion that the factor of lacking information does not affect the likelihood of using Loop.[29] Thus, the hypothesis can be rejected.

Finally, all of the findings from testing the hypotheses are summarized in the following table:

Table 1: Results of the hypotheses testing

RQ1	**What are the drivers for German consumers to use a reusable packaging system like Loop?**	**Findings**
H1.1	A main driver of the German consumers to use a system like Loop is their attitude towards sustainability	Supported
H1.2	German consumers are more likely to have a positive attitude towards a system like Loop, because they frequently engage in the existing return system for empty packaging	Partly Supported
H1.3	German consumers are willing to pay a deposit for the reusable containers because of the perceived environmental benefit	Supported
H1.4	German consumers are willing to pay a price premium for the reusable containers because of the perceived environmental benefit	Supported
RQ2	**What would the profile of the consumer look like who is most likely to use a reusable packaging system like Loop?**	**Findings**
H2.1	The highest likeliness to use Loop occurs amongst female consumers who are concerned about the pollution of the environment	Rejected
RQ3	**What are the barriers for the adoption of a reusable packaging system amongst the German consumers?**	**Findings**
H3.1	A significant barrier to use Loop is the lacking trust of German consumers into the hygiene of the containers	Partly supported
H3.2	The higher costs caused by the deposit system of Loop is a concern in the adoption of German consumers	Supported
H3.3	The perception of inconvenience of the Loop system poses a barrier for the German consumers to adopt it	Partly Supported
H3.4	The willingness to pay for products within the Loop system is negatively influenced by the income level of German consumers	Rejected
H3.5	Lacking information about the process of Loop holds German consumers back in their likelihood to use Loop	Rejected

Source: Own representation

[29] SPSS output in Appendix 13

3.4.2.5. Exploratory findings

To ensure a thorough analysis of the data, further tests were conducted to gain more insights.

T-tests of the two genders male and female with various variables have led to significant results. It can be shown that in their concern about the environment, gender makes a significant difference between the means (equal variances assumed, $\rho = 0.009$). The Cohen's d of 0.631 suggests a medium-sized effect. Additionally, there is a significant difference in the means when the respondents were asked whether they had intentions to adopt more sustainable practices in the future (equal variances assumed, $\rho = 0.007$). The effect size is almost the same as in the test before. In both cases, the Group Statistics show that female respondents are more concerned with the environment and have stronger intentions for the future. However, in another instance the gender was shown to not make a difference: the overall likelihood to use Loop. Here, the equal variances are not assumed ($\rho = 0.002$), and therefore the ρ of Equality of Means is 0.129.[30]

To possibly gain more insights into the demographic profile of the consumers who are more likely to use Loop, multiple ANOVAs were performed. However, none of the variables that were tested resulted in a statistically significant difference between the means (all $\rho > 0{,}05$).[31] Therefore, it can be said that the demographics do not influence the adoption of Loop.

[30] SPSS output in Appendix 14
[31] SPSS output in Appendix 14

4. Managerial Implications

The findings of this study on the adoption of Loop in the German market provide several actionable implications for Loop or other companies seeking to enter the German market with a similar concept.

When promoting the adoption of Loop, companies should strategically highlight its positive impact on the environment. German consumers, who have been shown to have pro-sustainability attitudes, can be effectively engaged by framing Loop as a conscientious choice that aligns with their environmental values. This should be leveraged by explaining the exact environmental impact of a reusable system like Loop, such as how much less plastic is generated or how much CO2 emissions are saved.

It is advisable for Loop to think strategically about pricing. While a price premium can be introduced, it should be moderate and not exceed 10-20% of the price of disposable plastic packaging. It is important to identify the threshold above which consumers will be unwilling to pay to avoid potential deterrents. In case a price premium is intended, it is important to highlight the above-mentioned explanation of Loop's environmental impact again. Appealing to the pro-environmental attitude of German consumers can lead to a higher willingness to pay. Therefore, the aspect of offering transparency and information about the impact of Loop is even more crucial.

The introduction of a deposit system is a reasonable measure, given its general acceptance among German consumers. However, caution should be exercised in setting deposit amounts, with a suggested maximum of €3 and preferably €2. Deposit amounts should be adjusted based on the container materials and sizes to optimize consumer acceptance.

Efforts to align Loop's process with the familiar take-back systems already existing in Germany are critical. It was shown that familiarity has an impact on the adoption, meaning that the process should not differ much from what the German consumers currently know. Emphasizing the convenience in daily life, especially by highlighting the flexibility of the online service, can increase Loop's appeal compared to traditional brick-and-mortar alternatives.

As gender does not significantly influence the likelihood of using Loop, gender-neutral communication strategies are recommended. Designing messages and marketing materials that are universally appealing will contribute to broader market penetration. However, what can be drawn from this study is that female consumers are more concerned about the environment

overall and have good intentions for the future. This suggests that appealing to their pro-sustainability attitudes should be a focus whenever the goal is to target female consumers.

It was shown that consumers inherently have trust in the hygiene of Loop's products, which can be leveraged when entering the German market. The hygiene aspect was previously perceived as a barrier, but instead, it can be turned into a driver for adoption. To foster this trust and attract consumers towards Loop, the company can emphasize its protocols by allowing insights into the cleaning facilities or explaining how its technology works.

Incorporating these insights into business strategies will enable companies to capitalize on identified strengths and address potential concerns, fostering a successful integration of an RPS into the German market.

5. Limitations and Future Research

5.1. Limitations

Although this work leads to significant results, it should be considered that there are limitations in the interpretation of it. The study was conducted with a relatively small sample and had many participants within the same age group. Therefore, it is advisable to validate the results in a larger sample, which is more evenly distributed in regard to the demographics.

It also must be recognized that this study is based on hypothetical scenarios and perceptions related to the concept of the Loop system. The lack of a tangible, real-world implementation of the Loop platform may introduce an element of speculative interpretation. Therefore, the results are based more on the perceptions and expectations of the respondents than on direct experience with an existing, operational Loop system.

Since sustainability is a trending topic that is taken seriously in current times, it must be considered that responses in the research may have been influenced by social desirability bias. Consumers could possibly want to be perceived more positively by stating their strong concern for the environment and intentions for using Loop.

5.2. Future Research

With the limitations of this work in mind, it would be necessary to conduct further research in the future to gain more comprehensive knowledge about German consumers and a possible launch of an RPS like Loop in Germany. Overall, when further research on this topic is conducted, it is advisable to cover a more diverse and bigger sample than in this work, to ensure that the research is representative of the German market. Since Loop is aimed at the whole FMCG sector, it may be interesting to find out whether there are differences in consumer acceptance in different product categories. By researching this aspect, the actionable scope of Loop can be determined. This was not covered in this work, but it would be an important aspect of the success of Loop. As a next step for Loop, a field study with the actual reusable containers in a test market could be performed to avoid the hypothetical aspect of this research and to include the physical aspect in assessing the platform, the products, and the service of Loop. This would lead to more reliable responses from the consumers, especially in their evaluation of the drivers and barriers, such as convenience, pricing, and hygiene. In this kind of field study, the researchers also have the opportunity to observe their behavior in a store and analyze it instead of asking the consumers for their opinions. This can circumvent the social desirability bias and prove whether the statements of consumers match their behavior in real life.

6. Conclusion

This study examines the drivers and barriers, as well as the possible profile of German consumers regarding the launch of an RPS like Loop in Germany. It shows that there are many drivers that could support a launch: the pro-environmental attitude of German consumers, their familiarity with return systems, and their positive WTP for both a deposit and a price premium. The barriers that were validated are the possible lack of trust in hygiene, high cost, and the perception of inconvenience. Regarding the demographics, the research shows no direct impact of the profile of a consumer on their likelihood to adopt Loop.

The findings of this work contribute empirical data and actionable insights to the adoption of sustainable packaging and provide a comprehensive understanding of consumer behavior. It offers practical recommendations for any industry stakeholders who are interested in the launch of RPSs in Germany.

Though there are opportunities for more research in the future, this research already shows a positive perception and valid drivers of a concept like Loop. Furthermore, because potential barriers were identified, they can be strategically taken into account in a market entry in Germany.

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Appendix

Appendix 1: Summary In-Depth interviews

Participants:
A: Male, 62 years old, Engineer
B: Male, 34 years old, Doctor
C: Female, 59 years old, Nurse
D: Female, 25 years old, Office Manager
E: Male, 24 years old, Student
F: Female, 26 years old, Student
G: Female, 21 years old, Student
H: Female, 41 years old, Marketing Manager
I: Male, 30 years old, Lawyer
J: Female, 67 years old, Retired

Sustainability in general:

1. How would you describe your general attitude towards sustainability and environmental issues, especially in relation to reducing plastic waste?

A: Environmental protection very important in general. Very motivated to reduce plastic waste. A lot is already being done here in Germany, but not enough. What we see in other countries is much worse.
B: Absolutely important topic; too few alternatives, too few options, especially in supermarkets
C: Extremely important, find it frightening when you see how much plastic waste is exported and piles up in other countries
D: Very important aspect that needs to be highlighted more and more. It is becoming increasingly important in our lives and we are seeing more and more of the damage plastic waste is doing to our environment. We need to look at how we can stop it
E: It's a fundamentally important issue that shouldn't be underestimated, but it's too rarely realized how much the next generations will suffer as a result. Personally, I try to avoid plastic and separate waste properly
F: I would like to be more sustainable, but I find it relatively difficult to avoid plastic, but of course it is a very important issue!
G: Sustainability is important to me in itself, but I find it difficult, especially because more sustainable options are often more expensive. The same goes for plastic waste.
H: The topic is important to me, I also try to reduce plastic waste. But everything within an uncomplicated framework.
I: I try to avoid plastic waste wherever possible, we have far too much plastic waste anyway. Also very important in general, we need many more cycles
J: I consider sustainability to be extremely important, especially given the amount of waste we produce every day. It is important to me not to pollute nature any further

2. Can you tell us about specific measures you are taking to reduce your plastic waste and minimize your environmental impact?

A: Recycling, especially for bottles, waste separation, water purifier (Soda Stream)

B: Generally less, but try to avoid plastic especially with fruit and vegetables; also avoid plastic bottles, have a soda stream and buy glass bottles
C: No longer use plastic bags, but nets instead; no fruit and vegetables in plastic trays; water fizzy drinks to avoid bottles (reusable); reusable cans and lids in the household; refill packs (bottles); make some products myself (yoghurt, cream cheese). Would like to go to an unpackaged store, but there are none nearby
D: Try to avoid disposable packaging, especially fruit and vegetables in plastic packaging. Unfortunately, it is often a price difference to buy without plastic. Rather buy paper or reusable packaging and stop using plastic bags.
E: Avoid plastic bags, avoid plastic cutlery, reusable bottles
F: I take my own bags with me when shopping, buy loose fruit and vegetables, order less online; if it costs the same, I buy without plastic
G: Reusable water bottle, cloth bag, soda stream
H: Fruit and vegetables without packaging, no plastic bags, plastic-free alternatives, soda stream
I: Vegetables and fruit without plastic, no plastic bags, buy as little new plastic as possible
J: I generally try to avoid plastic, especially plastic bags, fruit, vegetables, drinks

3. Have you ever bought products because you saw a positive impact on the environment? If so, which ones?
A: I don't do much shopping myself, but with drinks, for example, I make sure that I can return the bottles and prefer glass to plastic
B: Yes, I can think of a few ingredients that I avoid, e.g. everything without vegetable oil
C: Solid shampoo, soap; above all I pay attention to alternative types of packaging; milk in glass bottles
D: Yes, ecological packaging appeals to me, but sometimes I question whether it is really more sustainable. E.G: Detergents without microplastics, meat substitutes that are produced more sustainably
E: When it comes to clothes, sometimes second hand. I often use reCup or my own thermo mug etc
F: Yes, bamboo toothbrush, bamboo coffee mug, reusable bags, rubber baking mats
G: Reusable cotton pads, period underwear, refillable washing powder, wax cloths instead of cling film
H: I have switched to hard bars of soap, for example, even though I don't like it that much. Otherwise, some things happen subconsciously, but I often don't see the end consumer as being responsible either
I: Especially glass packaging instead of plastic
J: Yes, I occasionally buy products with environmentally friendly packaging and low levels of waste

Familiarity with/attitude towards return systems:
4. Would you say you are familiar with the concept of returning empty containers?
4.1 If yes, which return systems do you actively participate in?
A: Yes - For glass bottles and PET bottles in the deposit system
B: Yes - Glass bottles and plastic bottles with deposit; at work also sometimes reusable containers for food
C: Yes - Glass disposal, plastic bottles with deposit, reusable coffee cups with deposit at work (reCup)
D: Yes - mainly plastic bottles, glass bottles in crates, reCup system in the canteen
E: Yes - PET bottles, glass bottles, reCup as mentioned above
F: Yes - plastic bottles, gas bottles, reCup
G: Yes - I have used reBowl several times, plastic and glass bottles of course
H: Yes - deposit system for plastic and glass. I've also used reCup and reBowl several times
I: Yes - plastic bottles in the deposit system, glass bottles that are reused. Also used reCup before
J: Yes - I return PET bottles and glass bottles with a deposit

4.2 If yes, can you explain why you do this?
A: To protect the environment, reduce waste, reduce CO2 emissions
B: The main incentive is the deposit, but also because you know that the waste does not end up directly in the environment; the threshold for recycling is set relatively low, so you would hardly find any arguments against it
C: Avoid environmental pollution. Often thinks back to the past, when there was less waste anyway - would like to see more refill systems
D: Because I have the feeling that I am taking action against plastic waste. Environmental protection above all
E: I think it makes a lot of sense and should be introduced elsewhere. I don't see the point in just throwing everything in the bin when it can be reused
F: Basically just environmental protection
G: I think it's good that the waste goes to a designated place for recycling, but I also do it to get my money back
H: I think it's important to reduce plastic. If it's possible, I think it's right to reuse things
I: It's no effort for me, but it still has a big effect. It's a win-win situation, so to speak
J: The deposit system, i.e. the money, is an incentive for me to actively participate in it

5: What advantages and disadvantages do you see in these systems?
A: Pro: Environmental protection, less consumption of raw materials (fossil); Con: Price, hygiene, wear, and tear with reusable bottles
B: Pro: Waste is avoided, sustainable reuse; Con: You have a lot at home until you return it, effort for return
C: Pro: Less waste, less use of unhealthy substances in the production of plastic (microplastics); Con: Have to queue to return things (a bit time-consuming) - otherwise quite few negatives
D: Pro: less waste, more environmentally conscious living; Con: you have to pay a deposit once, which can be a hurdle for some people

E: Pro: recycling, reuse, you can get your money back (reward effect), resource-saving for manufacturers too; Con: none apart from the small amount of time involved
F: Pro: very simple system for environmental protection, less waste in my home; Con: not so convenient, you often forget something
G: Pro: Sustainability; Con: More effort with some systems, especially if you can't return items everywhere
H: Pro: plastic reduction, more conscious consumption, possibly closed loop; Con: need to be used at a high scale to be truly sustainable - lack of awareness of how often it needs to be used to be sustainable
I: Pro: clean product, environmental protection but still all the benefits of packaging; Con: not yet well managed in some cases, effort involved in returning them
J: Pro: Waste is reduced and recycled instead of ending up in the environment; Con: It is also a bit of a hassle

Attitude towards Loop:
Now that we've discussed the topic more generally, let me tell you about a platform called "Loop". Imagine this: You go to your usual supermarket to buy shampoo, ground coffee and detergent. Instead of the usual plastic packaging, they are available in glass and aluminum containers that can be used again and again. You take the products home, use them until they are empty and then you can put the empty packaging in a return container at any store near you. They are then cleaned in a specialized facility. Then the whole process starts again.
Alternatively, you can also use your supermarket's online store and order them online. The return system then works in a similar way to how the milkmen used to work. The supplier collects all empty packaging and returns full packaging.
6: What is your first impression of this concept?
A: Good general impression at first
B: First of all, it sounds good, very sensible, and not that difficult to organize
C: It's good, I would probably even do it online so that it's more practical and I don't have to store so much in between. If it really works in every supermarket, I would see it as practical. Of course, the system would have to be completely widespread for me to have access
D: Really good, very positive
E: Good idea
F: I think it's great
G: I would do it immediately
H: Basically positive at first, I think it's good
I: Really good, hope it can be maintained with the cleaning. Circulation in a place where you go shopping anyway, it seems practicable for now (instead of reCup, for example)
J: I find it very interesting in itself

7. Are there any doubts about the concept?
A: It would be important that the containers can really be reused very often and are designed for this; question whether it makes a difference in CO2 production; does the whole thing make sense if the containers are rather small? How convenient is the concept for me?
B: Introduction could be a bit difficult. It should be easy to sign up and clear information should be available. How high is the acceptance without a lot of advertising etc? The app is great for young people, but older people may have some problems. I imagine the online solution would be a bit difficult in rural areas
C: Is it more expensive? Would the general public accept it? How practical is it - because if everything is in glass, is it heavier?
D: There may be people who don't return everything, which would of course be counterproductive
E: could be a big adjustment for many people, especially when it comes to handling the packaging. Then more effort to bring everything back, but many are too comfortable. Everyone has to actively participate because otherwise the manufacturer will still have to produce again. A lot of effort in the online business - risks for the manufacturer - but more convenient for the consumer.
F: If it's reusable for every product in my household, I have to take care of all the packaging I have at home and always have to replace and return everything. How sustainable is it really? How will the logistics be?
G: I don't know how spontaneously I would go shopping, I might feel a bit restricted. What does wear and tear do to the quality of the containers?
H: How often does it need to be reused for it to be sustainable? So basically there's a lack of transparency. How often will I forget to return my containers - do I find it easier online then
I: Question of cost effectiveness, acceptance and scaling - if it's more expensive, people will go back to plastic
J: I wonder how sustainable the whole process really is

8: Could you imagine taking part in it?
A: Yes, if the doubts mentioned are resolved
B: Yes
C: Definitely
D: Without really knowing the disadvantages, yes
E: Basically yes, you can do something good with it, save resources and be more sustainable. But I also have to consider whether some restrictions are worth it to me and that I'm bringing everything back
F: Yes
G: Yes
H: Yes

I: Yes
J: Yes, if I get more information

Loop - Pricing:

Now imagine the same scenario, but when you buy the products in reusable containers, you have to pay a deposit of about €0.10-10 for each container at the checkout. Then, when you return them, you scan QR codes when you put them back in the return container and an app then gives you the deposit back, which you can then transfer to your bank account.
If you have ordered online, your empty containers will be collected in a reusable bag registered to you, so that when you return them to a Loop facility, the QR code is scanned and the deposit is also transferred back to you via the app.

9: Has your impression of the concept changed now?

A: I would have assumed it was a deposit system anyway, so not really; but there are limits for me, I can't imagine paying a €10 deposit for aluminum packaging for coffee, for example
B: Not much, I already know deposit systems, so I find it logical
C: The same because I would appreciate the reduction in waste. I grew up with a deposit, so I'm familiar with it anyway and it's worth it to me if I know that it really reduces waste
D: Yes, if it was really as high as €5-10, that would stop me. Even if I know I'll get it back, the sum adds up. I think I'd prefer it if I only had to buy everything once and the containers were then mine
E: The deposit system could change the incentive for consumers to pay more attention and try to return the packaging more actively
F: I think it's justified to take a deposit as an incentive, but a few questions arise, e.g. if something breaks
G: I would have expected there to be a deposit on it anyway, otherwise the incentive might be missing. I find it difficult when the deposit amount is so high, because it adds up and not everyone can afford it
H: No, I already know about deposits. The amount would be decisive - it has to be proportionate
I: A deposit is necessary, otherwise you probably keep everything. Unfortunately, it's a bit more complicated because the money is always going back and forth and there are 1-2 more steps with QR codes etc
J: The deposit itself doesn't change anything, but I'm a bit worried about the technical aspects. How do I operate the app, for example?

10: Apart from the deposit, how do you imagine the prices of products in reusable packaging?

A: I would of course like it to be cheaper; Equally expensive would be reasonable for me; More expensive would be illogical for me in the long run because I don't pay anything more for the packaging itself
B: I hope it wouldn't be more expensive because I'm putting in the effort to bring it back. In contrast to the constant production of plastic packaging, the washing process should not be much more expensive here - so it should balance out.
C: The expectation would be that it would be more expensive, especially for cleaning
D: I would tend to think it would be more expensive because I imagine the whole process would be more time-consuming
E: I think you have to pay more than for disposable packaging.
F: It should actually be the same price
G: I would expect it to be more expensive
H: Would expect it to be slightly more expensive, but as a consumer I don't think that's justified
I: Rather a slightly more expensive product, especially branded products that participate, so anyway
J: It will probably be a little more expensive

11: Would you be willing to pay more for this than for single-use plastic packaging?

A: It depends a bit when I see the packaging etc. how much it's worth to me; but in itself, I would pay a fraction more for sustainability
B: Not really for the packaging, because it also gets worn out
C: Yes, but there's already inflation anyway, so not too much
D: Yes, for the sustainability aspect, but to a certain extent
E: Yes, because it's more sustainable and efficient
F: Not at the moment, because I'm not working, but if so, then for selected things
G: Depends on how much, but not at the moment
H: I wouldn't be completely against it, but I don't see myself as being responsible
I: Yes, definitely for the sustainability aspect
J: Yes, because the environment is that important to me

11.1 If you imagine that the detergent in single-use plastic costs €5, could you estimate how much more you would pay?

A: max. 10% more in reusable
B: Maybe 1€ more, more like 10-15% in general
C: I would pay about €1-1.50 more
D: About €1.50 more
E: Maybe 1€
F: As I said, nothing at the moment, a few cents at most
G: Then about 50 cents
H: Maybe 10%
I: I would pay €10, especially at the beginning, but it would have to be less in the long run if it scales up
J: Maybe about 20%

12. How do you think your income influences your willingness to pay?
A: A lot, I don't have to look at the last cent, that's why I would do it, but others wouldn't
B: A lot, maybe 1 euro doesn't matter that much to me, but it does to others
C: Quite a lot, I'm happy to pay something, but I also know lots of people who cut corners and wouldn't do it
D: I don't think so much, I could afford a bit more, but I don't really want to pay it, because consumers shouldn't suffer if it's environmental protection
E: Very much so, because with a higher income you pay less attention to prices and price increases
F: It really only depends on that
G: Very much, if I had a good job, I would gladly pay more
H: Completely, I probably wouldn't want to pay anything for it otherwise
I: Quite a lot, I can afford it, then I do it too
J: A little bit, the sustainability aspect would be worth something to me either way, but I have the money too

Loop - Hygiene:
13. How much confidence do you have in the hygiene and safety of the reusable containers provided by Loop?
A: The system would have to earn my trust through a lot of transparency, appearance of the packaging
B: Would have very littles concern, especially with loose products, cleaning products etc. I would assume that there are high quality controls
C: I would assume that there is nothing wrong with it, otherwise it wouldn't even exist in Germany
D: Fair, rather mediocre, because I find it difficult to imagine that the cleaning process is simple, or it could be less sustainable
E: I think there is a certain risk, but it will certainly be legally linked to criteria and have to be certified, so I wouldn't worry too much about it
F: High level of trust due to the high standards in quality control but I still have a weird feeling about it for some products
G: I have some worries, I don’t know how much I trust the cleaning process
H: I know German standards and quality controls, so very much
I: Very high confidence, because if the regulations weren't adhered to, they wouldn't exist. They can't afford to be unhygienic. And glass and aluminum are also very durable anyway
J: That would be a decisive factor for me. I expect the highest standards, especially in terms of hygiene.

14: Are there any products that you would be more or less likely to buy in reusable containers?
A: Food, especially drinks, we already do it, but what I'm less likely to buy is food with a short best-before date and a lot of fat; Rather dry or long shelf life; Less concern about non-food products
B: Anything that doesn't have such a long shelf life, i.e. where bacteria etc. grow more quickly. Or I would have to know that the cleaning process is sterilizing
C: I don't really care, I would spontaneously say I would buy more non-food products in reusable packaging
D: I would be less likely to buy milk, for example, because it just seems less hygienic if the bottle has already been used. Facial care perhaps less so for the same reason. Fresh products, especially things that don't keep that long anyway, seem more unhygienic to me
E: I think if the system catches on, it's mainly a matter of getting used to it, so I don't think I would exclude any products, I think it will work easiest with drinks
F: Rather only dry products, because I don't like the idea of things lying at home for a long time and possibly getting moldy
G: Dry products or products with a longer shelf life in general, I don't like the idea of things not being cleaned for so long
H: I would make it dependent on the convenience. I would have to feel my way around first, I would start with things that I can keep for a long time
I: Very greasy things are very difficult to clean and last forever (hand cream) perhaps less. For things that are used up very quickly, it would make more sense to me because the impact is higher
J: I would be more willing to buy longer-lasting products in reusable containers than ones that have a short shelf-life

Loop - Convenience:
15. How do you feel about the convenience / practicality of the process of using Loop?
A: As long as it is available near me, I find it convenient
B: I think buying and returning at the supermarket shouldn't be a problem if it's like the current deposit system. And online as well, if it's similar to Flink, Gorilla etc
C: For me it would be more convenient if I did it online. Sometimes I just forget empties at home
D: Weight could possibly have an influence because it is less convenient. I think it is practicable in itself
E: I think that it can be inconvenient and a hurdle for many people to return the majority of used consumer goods packaging to certain stations.
Families in particular quickly accumulate a large amount, which means that transportation and storage will not always be practical and easy.
F: I think that's a relatively big problem, because in large quantities, all the containers are no longer so convenient
G: I find it difficult in large quantities because you have to take care of a lot of things that are standing around at home - online could perhaps work
H: I find the online system super convenient. If I have to take everything with me myself, it's pretty impractical for me personally if everything piles up
I: The way it's planned, it will work if it's widespread in supermarkets. You won't forget anything because of the high deposit

J: So far, it sounds about as convenient as the current deposit system. Provided it doesn't get much more complicated for me because of the technology.

16: Could you imagine integrating it into your everyday life now?
A: Yes, in itself, but it doesn't affect me that much because I don't do much shopping myself
B: Yes, if it is very widely available
C: Yes, very good, I don't see it as awkward if I really want to do it. It just takes a bit of self-discipline.
D: Yes, I'm used to the deposit system anyway and I almost always go shopping by car. And in terms of my basic attitude, it would be important to me
E: Yes, if there was a good network with lots of drop-off stations nearby.
F: Difficult, because I don't have the money at the moment and in large quantities
G: For some things yes
H: Online system yes, otherwise not
I: Yes, especially for individual products
J: I might need a few more instructions, but in principle, yes.

Concluding question:
17. Is there anything else you would like to add or insights you think are important to understand the consumer perspective on Loop?
A: Maybe it's smarter to think about large and small containers, that you buy large and have small units to refill at home so you don't have to buy and bring back so many small individual containers
B: It needs to be very highly scaled, quite broadly based. It needs to be communicated very well, both in advertising etc. and at the POS, so that people become aware of it and understand it
C: Loop would have to present itself very strongly and present very clearly how it works, how the process works and put it very much in the foreground. Transparency must inspire trust.
D: To what extent is this financed, i.e. where is the money added? I believe that there are relatively many critics in Germany and that there are other countries that are further ahead. You certainly have to convince some Germans, place advertisements, and create transparency about the effects. But there will still be people who ignore the problem
E: I think the issue of cleaning in particular is very important for many people and needs to be communicated very transparently and clearly.
F: Provide transparency about the processes and impacts - e.g. how often a container needs to be used for it to be more sustainable than plastic
G: There must be incentives and a lot of communication
H: Need a lot of information, transparency about the process etc. and about the impact - incentivized by knowing the benefits
I: Pricing and practicability seem most important to me, rather than design, etc
J: Transparency about the whole process is crucial for me. I would like to clearly understand what is expected of me and how everything works before I decide to participate.

Appendix 2: Online survey questionnaire

Dear participant, welcome and thank you for your interest in this study!
The survey is being conducted as part of my Master thesis at Católica Lisbon School of Business and Economics.
The following questions aim to study my topic of a New Product Innovation. The survey is expected to take around 10 minutes to complete.
Your participation is completely voluntary. The data collected in this questionnaire will be treated anonymously and confidentially.
Thank you for taking your time in assisting me with this research, I really appreciate your input, and your experience is very important for me!

If you have any questions or follow-up thoughts, please do not hesitate to contact me at s-champhoff@ucp.pt.

Thank you!
Carola Hamphoff

Q1 Are you a resident in Germany?

- ○ Yes (1)
- ○ No (2)

Q2 Please indicate how much you agree with the following statements.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I am generally concerned with the protection of our environment (1)	○	○	○	○	○
I buy products that I perceive as beneficial to the environment (2)	○	○	○	○	○
I consider plastic waste as a significant issue for the environment (3)	○	○	○	○	○
I intend to adopt more practices that are environmentally friendly in the future (4)	○	○	○	○	○

Q3 How familiar are you with the concept of returning empty packaging to be recycled and/or reused in Germany? (E.g. PET bottles, glass bottles, reCup etc)

- ○ Not familiar at all (1)
- ○ Slightly familiar (2)
- ○ Moderately familiar (3)
- ○ Very familiar (4)
- ○ Extremely familiar (5)

Q4 How often do you participate in these systems, meaning you return packaging to the according take-back location?

- ○ More than 1x a week (5)
- ○ 1-4 times a month (4)
- ○ Every 2-4 months (3)
- ○ Every 5-12 months (2)
- ○ Less than 1 time a year (1)
- ○ Never (0)

Q5 Please pick the ones you use on a regular basis (every 2-4 months or more) below. Multiple answers are possible.

- ☐ PET bottles (1)
- ☐ Glass bottles in crates (2)
- ☐ Singular glass bottles (3)
- ☐ reCup (4)
- ☐ Vytal (5)
- ☐ Others (6) _____

Q6 Please rank the motivators to participate in return systems below by how much they influence you personally.
Most influential is in the 1st place.

_____ The deposit makes me return it (1)
_____ Creating less plastic waste (sustainability) (2)
_____ It makes me feel better about myself (3)
_____ Peer pressure from society (4)

The next few questions will revolve around a reusable packaging platform called "Loop". I would like to introduce the concept to you here:

Please imagine this scenario: you go to buy a shampoo, ground coffee and detergent in your local store. Instead of finding them in the usual plastic packaging, they are available in glass and aluminum containers that can be reused over and over again. The brand and product quality are unchanged since major manufacturers are partnered up with Loop and fill their products into the reusable containers. When purchasing the products in the reusable container, you have to pay a deposit of 0.10-10€ at the check-out for each container. You go home, use the product until it is empty and then, in any store around you, you can return the empty packaging at a return container to be cleaned at a specialized facility. When you return them, you scan QR codes when putting them into the return container. Afterwards you receive the deposit back via an app, where you can then transfer the amount to your bank account. Then the containers are refilled and the whole process repeats.

Alternatively, you could also use the online shop of stores who are partnered with Loop and order the products online. The return system then works like the milk men in the past. The provider picks all of the empty packaging up and returns full ones.

Q7 Based on this description of the concept, how likely are you to use it?

- ○ Extremely unlikely (1)
- ○ Somewhat unlikely (2)
- ○ Neither likely nor unlikely (3)
- ○ Somewhat likely (4)
- ○ Extremely likely (5)

Q8 Having all of the information about the way the system works, please indicate how much you agree with the following statements.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
My initial feeling towards this concept is positive (1)	○	○	○	○	○
I am willing to pay a deposit for each returnable container (2)	○	○	○	○	○
The pricing is a significant factor in my consideration to use Loop (3)	○	○	○	○	○
I would be willing to pay more for a product within the Loop system compared to single-use plastic (4)	○	○	○	○	○
I could imagine using this concept on a regular basis (5)	○	○	○	○	○
This concept sounds like it is a convenient solution against single-use plastic (6)	○	○	○	○	○
I would trust the containers to be clean when I buy them (7)	○	○	○	○	○
The fact that other people may have used the same container as me is off-putting to me (8)	○	○	○	○	○
I have doubts about the positive environmental impact of the whole process (9)	○	○	○	○	○
I still have a lot of questions about the process and sustainable impact (10)	○	○	○	○	○

Q9 Please indicate how you would evaluate the level of each attribute regarding the service and products of Loop based on the information you received.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	
Affordable (1)	○	○	○	○	○	Expensive
Good for environment (2)	○	○	○	○	○	Bad for environment
Convenient (3)	○	○	○	○	○	Inconvenient
Hygienic (4)	○	○	○	○	○	Contaminated

Q10 Please rank these factors by how important they are to you in the decision to adopt Loop.
Most important is in 1st place.

_____ Convenience in daily life (1)
_____ Pricing compared to single-use plastic (2)
_____ Amount of deposit (3)
_____ Sustainability (prevention of plastic waste) (4)
_____ Hygiene of the containers (5)

Q11 Please indicate the maximum amount of how much of a deposit you would be willing to pay for a reusable container.

	0	1	2	3	4	5	6	7	8	9	10
Max. Deposit amount in € ()											

Q12 If you can, please indicate how much of a price premium (w/o deposit) you would be willing to pay for the reusable packaged products instead of single-use packaging.
As an example, please imagine a washing detergent (1l) in a single-use packaging that costs 5€. How much would you be willing to pay for the same product in a reusable (aluminium) packaging?

If you are not willing to pay more, please indicate the base price of 5€.

	5	6	6	7	7	8	8	9	9	10
Total € price for reusable packaging ()										

Q13 What gender do you identify as?

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Q14 How old are you?

- ○ Under 18 (1)
- ○ 18 - 24 (2)
- ○ 25 - 34 (3)
- ○ 35 - 44 (4)
- ○ 45 - 64 (5)
- ○ 65 - 84 (6)
- ○ 85 or older (7)

Q15 What is your gross monthly income?

- ○ No income (1)
- ○ Less than €1500 (2)
- ○ €1500 - €2499 (3)
- ○ €2500 - €3499 (4)
- ○ €3500 - €4499 (5)
- ○ More than €4500 (6)

Q16 What is your current occupation?

- ○ Employed (1)
- ○ Unemployed (2)
- ○ Retired (3)
- ○ Student (4)
- ○ Other (5)

Q17 How would you describe the area you live in?

- ○ Urban area (1)
- ○ Suburb (2)
- ○ Small town (3)
- ○ Rural (4)

Appendix 3: Factor analysis – SPSS output

Factor Analysis

Correlation Matrix

		Q8_1 Agreement - My initial feeling towards this concept is positive	Q8_2 Agreement - I am willing to pay a deposit for each returnable container	Q8_3 Agreement - The pricing is a significant factor in my consideration to use Loop	Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic	Q8_5 Agreement - I could imagine using this concept on a regular basis	Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic	Q8_7 Agreement- I would trust the containers to be clean when I buy them	Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me	Q8_9 Agreement- I have doubts about the positive environmental impact of the whole process	Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact
Correlation	Q8_1 Agreement - My initial feeling towards this concept is positive	1,000	,484	-,014	,392	,602	,546	,401	-,335	-,255	-,062
	Q8_2 Agreement - I am willing to pay a deposit for each returnable container	,484	1,000	-,183	,440	,652	,470	,386	-,214	-,187	-,077
	Q8_3 Agreement - The pricing is a significant factor in my consideration to use Loop	-,014	-,183	1,000	-,179	-,064	,113	,103	,047	,018	-,059
	Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic	,392	,440	-,179	1,000	,560	,359	,139	-,002	-,292	,096
	Q8_5 Agreement - I could imagine using this concept on a regular basis	,602	,652	-,064	,560	1,000	,537	,327	-,226	-,192	-,046
	Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic	,546	,470	,113	,359	,537	1,000	,380	-,167	-,238	-,183
	Q8_7 Agreement- I would trust the containers to be clean when I buy them	,401	,386	,103	,139	,327	,380	1,000	-,531	-,366	-,155
	Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me	-,335	-,214	,047	-,002	-,226	-,167	-,531	1,000	,310	,119
	Q8_9 Agreement- I have doubts about the positive environmental impact of the whole process	-,255	-,187	,018	-,292	-,192	-,238	-,366	,310	1,000	,361
	Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact	-,062	-,077	-,059	,096	-,046	-,183	-,155	,119	,361	1,000

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,754
Bartlett's Test of Sphericity	Approx. Chi-Square	422,803
	df	45
	Sig.	<,001

Communalities

	Initial	Extraction
Q8_1 Agreement - My initial feeling towards this concept is positive	1,000	,855
Q8_2 Agreement - I am willing to pay a deposit for each returnable container	1,000	,867
Q8_3 Agreement - The pricing is a significant factor in my consideration to use Loop	1,000	,939
Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic	1,000	,860
Q8_5 Agreement - I could imagine using this concept on a regular basis	1,000	,766
Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic	1,000	,728
Q8_7 Agreement- I would trust the containers to be clean when I buy them	1,000	,838
Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me	1,000	,854

Q8_9 Agreement- I have doubts about the positive environmental impact of the whole process	1,000	,905
Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact	1,000	,936

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,622	36,217	36,217	3,622	36,217	36,217	1,984	19,839	19,839
2	1,536	15,359	51,576	1,536	15,359	51,576	1,593	15,930	35,769
3	1,089	10,887	62,463	1,089	10,887	62,463	1,529	15,294	51,063
4	1,022	10,221	72,684	1,022	10,221	72,684	1,190	11,905	62,968
5	,750	7,505	80,189	,750	7,505	80,189	1,157	11,572	74,539
6	,529	5,294	85,483	,529	5,294	85,483	1,094	10,944	85,483
7	,463	4,627	90,110						
8	,376	3,763	93,873						
9	,347	3,467	97,340						
10	,266	2,660	100,000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
Q8_1 Agreement - My initial feeling towards this concept is positive	,865	-,279	,113	,113	,026	-,048
Q8_2 Agreement - I am willing to pay a deposit for each returnable container	,330	-,153	,839	,051	-,054	-,158
Q8_3 Agreement - The pricing is a significant factor in my consideration to use Loop	,045	,000	-,113	-,040	-,019	,960
Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic	,392	,196	,410	,632	,282	-,144
Q8_5 Agreement - I could imagine using this concept on a regular basis	,634	-,073	,572	,159	,056	-,060
Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic	,714	-,060	,343	,086	-,203	,219
Q8_7 Agreement- I would trust the containers to be clean when I buy them	,102	-,743	,429	,168	-,075	,237
Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me	-,200	,891	,041	-,057	,030	,123
Q8_9 Agreement- I have doubts about the positive environmental impact of the whole process	-,081	,310	,004	-,834	,326	-,012
Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact	-,056	,046	-,028	-,117	,957	-,018

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 9 iterations.

Appendix 4: Hypothesis 1.1 - SPSS output

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,416[a]	,173	,147	,944	1,978

a. Predictors: (Constant), Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future, Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment

b. Dependent Variable: Q7 How likely are you to use Loop?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24,358	4	6,089	6,837	<,001[b]
	Residual	116,672	131	,891		
	Total	141,029	135			

a. Dependent Variable: Q7 How likely are you to use Loop?

b. Predictors: (Constant), Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future, Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,508	,767		,662	,509		
	Q2_1 Agreement - I am generally concerned with the protection of our environment	-,145	,162	-,091	-,890	,375	,605	1,654
	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	,173	,128	,145	1,353	,178	,553	1,807
	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	,414	,151	,240	2,744	,007	,827	1,210
	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	,321	,157	,210	2,037	,044	,597	1,675

a. Dependent Variable: Q7 How likely are you to use Loop?

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Q2_1 Agreement - I am generally concerned with the protection of our environment	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future
1	1	4,941	1,000	,00	,00	,00	,00	,00
	2	,030	12,788	,06	,00	,55	,09	,00
	3	,012	20,226	,06	,25	,03	,00	,82
	4	,010	22,492	,00	,51	,38	,43	,18
	5	,007	26,041	,88	,24	,04	,48	,00

a. Dependent Variable: Q7 How likely are you to use Loop?

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,74	4,32	3,81	,425	136
Residual	-3,321	1,614	,000	,930	136
Std. Predicted Value	-4,861	1,207	,000	1,000	136
Std. Residual	-3,520	1,711	,000	,985	136

a. Dependent Variable: Q7 How likely are you to use Loop?

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,406[a]	,164	,139	,948	1,656

a. Predictors: (Constant), Q9_4 Evaluate attributes Loop- Hygienic:Contaminated, Q9_1 Evaluate attributes Loop - Affordable:Expensive, Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q9_3 Evaluate attributes Loop- Convenient:Inconvenient

b. Dependent Variable: Q7 How likely are you to use Loop?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23,190	4	5,797	6,445	<,001[b]
	Residual	117,840	131	,900		
	Total	141,029	135			

a. Dependent Variable: Q7 How likely are you to use Loop?

b. Predictors: (Constant), Q9_4 Evaluate attributes Loop- Hygienic:Contaminated, Q9_1 Evaluate attributes Loop - Affordable:Expensive, Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q9_3 Evaluate attributes Loop- Convenient:Inconvenient

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	5,260	,348		15,118	<,001		
	Q9_1 Evaluate attributes Loop - Affordable:Expensive	-,082	,085	-,081	-,963	,337	,908	1,101
	Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment	-,253	,111	-,194	-2,291	,024	,886	1,128
	Q9_3 Evaluate attributes Loop- Convenient:Inconvenient	-,237	,086	-,243	-2,746	,007	,813	1,230
	Q9_4 Evaluate attributes Loop- Hygienic:Contaminated	-,074	,097	-,067	-,769	,443	,847	1,181

a. Dependent Variable: Q7 How likely are you to use Loop?

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	Q9_1 Evaluate attributes Loop - Affordable:Expensive	Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment	Q9_3 Evaluate attributes Loop- Convenient:Inconvenient	Q9_4 Evaluate attributes Loop- Hygienic:Contaminated
1	1	4,614	1,000	,00	,00	,01	,00	,01
	2	,146	5,619	,00	,00	,87	,08	,14
	3	,117	6,284	,03	,26	,10	,00	,51
	4	,085	7,373	,05	,08	,02	,91	,20
	5	,038	11,006	,91	,65	,00	,00	,15

a. Dependent Variable: Q7 How likely are you to use Loop?

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2,51	4,61	3,81	,414	136

Residual	-3,448	1,748	,000	,934	136
Std. Predicted Value	-3,139	1,939	,000	1,000	136
Std. Residual	-3,635	1,843	,000	,985	136

a. Dependent Variable: Q7 How likely are you to use Loop?

Appendix 5: Hypothesis 1.2 – SPSS output

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,286[a]	,082	,068	,96547910	1,908

a. Predictors: (Constant), Q4, Q3 Familiarity returning empty packaging to be recycled and/or reused in Germany? (E.g. PET bottles, glass bottles, reCup etc)

b. Dependent Variable: FactorQ8_positive perception

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11,024	2	5,512	5,913	,003[b]
	Residual	123,976	133	,932		
	Total	135,000	135			

a. Dependent Variable: FactorQ8_positive perception

b. Predictors: (Constant), Q4, Q3 Familiarity returning empty packaging to be recycled and/or reused in Germany? (E.g. PET bottles, glass bottles, reCup etc)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	-1,095	,481		-2,276	,024		
	Q3 Familiarity returning empty packaging to be recycled and/or reused in Germany? (E.g. PET bottles, glass bottles, reCup etc)	,340	,099	,292	3,439	<,001	,955	1,047
	Q4	-,065	,093	-,060	-,705	,482	,955	1,047

a. Dependent Variable: FactorQ8_positive perception

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Q3 Familiarity returning empty packaging to be recycled and/or reused in Germany? (E.g. PET bottles, glass bottles, reCup etc)	Q4
1	1	2,942	1,000	,00	,00	,01
	2	,038	8,761	,01	,47	,73
	3	,020	12,249	,99	,52	,26

a. Dependent Variable: FactorQ8_positive perception

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N

Predicted Value	-1,0160965	,4089782	,0000000	,28576169	136
Residual	-3,44350457	1,75981426	,00000000	,95830071	136
Std. Predicted Value	-3,556	1,431	,000	1,000	136
Std. Residual	-3,567	1,823	,000	,993	136

a. Dependent Variable: FactorQ8_positive perception

Appendix 6: Hypothesis 1.3 – SPSS output

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,430[a]	,184	,153	,885

a. Predictors: (Constant), Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future, Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23,052	5	4,610	5,882	<,001[b]
	Residual	101,890	130	,784		
	Total	124,941	135			

a. Dependent Variable: Q8_2 Agreement - I am willing to pay a deposit for each returnable container

b. Predictors: (Constant), Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future, Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,194	,800		,243	,809
	Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment	-,006	,103	-,005	-,056	,955
	Q2_1 Agreement - I am generally concerned with the protection of our environment	,105	,153	,070	,690	,491
	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	-,019	,121	-,017	-,158	,875
	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	,508	,141	,313	3,589	<,001
	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	,226	,149	,157	1,515	,132

a. Dependent Variable: Q8_2 Agreement - I am willing to pay a deposit for each returnable container

Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,490[a]	,240	,234	,842

a. Predictors: (Constant), Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29,945	1	29,945	42,240	<,001[b]
	Residual	94,996	134	,709		
	Total	124,941	135			

a. Dependent Variable: Q8_2 Agreement - I am willing to pay a deposit for each returnable container

b. Predictors: (Constant), Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,764	,150		31,819	<,001
	Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)	-,352	,054	-,490	-6,499	<,001

a. Dependent Variable: Q8_2 Agreement - I am willing to pay a deposit for each returnable container

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,425[a]	,181	,143	2,05974	2,060

a. Predictors: (Constant), Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste), Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future

b. Dependent Variable: Q11 Max. Deposit amount in €

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	120,649	6	20,108	4,740	<,001[b]
	Residual	547,284	129	4,243		
	Total	667,934	135			

a. Dependent Variable: Q11 Max. Deposit amount in €

b. Predictors: (Constant), Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste), Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-,390	2,023		-,193	,848		
	Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)	-,501	,140	-,301	-3,581	<,001	,899	1,112
	Q2_1 Agreement - I am generally concerned with the protection of our environment	,139	,356	,040	,391	,696	,599	1,668
	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	-,034	,281	-,013	-,122	,903	,545	1,834

	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	,971	,330	,259	2,945	,004	,823	1,215
	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	-,093	,350	-,028	-,266	,791	,573	1,744
	Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment	,112	,240	,039	,467	,642	,888	1,126

a. Dependent Variable: Q11 Max. Deposit amount in €

Collinearity Diagnostics[a]

				Variance Proportions						
Model	Dimension	Eigenvalue	Condition Index	(Constant)	Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)	Q2_1 Agreement - I am generally concerned with the protection of our environment	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	Q9_2 Evaluate attributes Loop- Good for environment: Bad for environment
1	1	6,521	1,000	,00	,00	,00	,00	,00	,00	,00
	2	,246	5,152	,00	,50	,00	,01	,00	,00	,11
	3	,182	5,986	,00	,33	,00	,00	,00	,00	,67
	4	,025	16,192	,03	,04	,00	,63	,14	,01	,09
	5	,011	23,887	,01	,01	,41	,00	,01	,72	,03
	6	,010	25,895	,00	,00	,40	,34	,52	,23	,00
	7	,006	33,484	,96	,12	,19	,02	,33	,04	,10

a. Dependent Variable: Q11 Max. Deposit amount in €

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-,3147	4,7101	3,2221	,94536	136
Residual	-3,76947	7,23335	,00000	2,01344	136
Std. Predicted Value	-3,741	1,574	,000	1,000	136
Std. Residual	-1,830	3,512	,000	,978	136

a. Dependent Variable: Q11 Max. Deposit amount in €

Appendix 7: Hypothesis 1.4 – SPSS output

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,495[a]	,245	,216	,895	1,986

a. Predictors: (Constant), Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future, Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment

b. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33,828	5	6,766	8,448	<,001[b]
	Residual	104,106	130	,801		
	Total	137,934	135			

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

b. Predictors: (Constant), Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future, Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	,201	,809		,249	,804		
	Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment	-,231	,104	-,179	-2,218	,028	,889	1,125
	Q2_1 Agreement - I am generally concerned with the protection of our environment	,240	,154	,153	1,560	,121	,604	1,656
	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	,091	,122	,077	,743	,459	,546	1,830
	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	,255	,143	,149	1,782	,077	,826	1,210
	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	,245	,151	,162	1,620	,108	,583	1,716

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment	Q2_1 Agreement - I am generally concerned with the protection of our environment	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future
1	1	5,743	1,000	,00	,00	,00	,00	,00	,00
	2	,203	5,322	,00	,71	,00	,01	,00	,00
	3	,026	14,861	,04	,13	,00	,61	,12	,00
	4	,012	22,262	,03	,04	,35	,00	,00	,77
	5	,010	24,275	,00	,00	,45	,36	,48	,21
	6	,007	29,613	,93	,12	,20	,02	,39	,01

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,63	4,12	3,48	,501	136
Residual	-2,293	1,788	,000	,878	136
Std. Predicted Value	-3,699	1,289	,000	1,000	136
Std. Residual	-2,562	1,998	,000	,981	136

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson

1	,462[a]	,213	,208	,900	1,878

a. Predictors: (Constant), Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)

b. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29,434	1	29,434	36,352	<,001[b]
	Residual	108,500	134	,810		
	Total	137,934	135			

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

b. Predictors: (Constant), Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4,323	,160		27,016	<,001		
	Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)	-,349	,058	-,462	-6,029	<,001	1,000	1,000

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)
1	1	1,876	1,000	,06	,06
	2	,124	3,891	,94	,94

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2,58	3,97	3,48	,467	136
Residual	-1,974	1,424	,000	,896	136
Std. Predicted Value	-1,931	1,062	,000	1,000	136
Std. Residual	-2,193	1,582	,000	,996	136

a. Dependent Variable: Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,445[a]	,198	,161	,77565	1,980

a. Predictors: (Constant), Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste), Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future

b. Dependent Variable: Q12 Total € price for reusable packaging (based on 5€)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19,193	6	3,199	5,317	<,001[b]
	Residual	77,611	129	,602		
	Total	96,803	135			

a. Dependent Variable: Q12 Total € price for reusable packaging (based on 5€)

b. Predictors: (Constant), Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment, Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste), Q2_3 Agreement - I consider plastic waste as a significant issue for the environment, Q2_2 Agreement - I buy products that I perceive as beneficial to the environment, Q2_1 Agreement - I am generally concerned with the protection of our environment, Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4,759	,762		6,246	<,001		
	Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)	-,153	,053	-,242	-2,907	,004	,899	1,112
	Q2_1 Agreement - I am generally concerned with the protection of our environment	,199	,134	,151	1,482	,141	,599	1,668
	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	-,139	,106	-,140	-1,311	,192	,545	1,834
	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	,131	,124	,092	1,059	,292	,823	1,215
	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	,213	,132	,168	1,617	,108	,573	1,744
	Q9_2 Evaluate attributes Loop- Good for environment:Bad for environment	-,140	,090	-,129	-1,546	,125	,888	1,126

a. Dependent Variable: Q12 Total € price for reusable packaging (based on 5€)

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Q10_4 Rank influencing factors adoption - Sustainability (prevention of plastic waste)	Q2_1 Agreement - I am generally concerned with the protection of our environment	Q2_2 Agreement - I buy products that I perceive as beneficial to the environment	Q2_3 Agreement - I consider plastic waste as a significant issue for the environment	Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	Q9_2 Evaluate attributes Loop- Good for environment: Bad for environment
1	1	6,521	1,000	,00	,00	,00	,00	,00	,00	,00
	2	,246	5,152	,00	,50	,00	,01	,00	,00	,11
	3	,182	5,986	,00	,33	,00	,00	,00	,00	,67
	4	,025	16,192	,03	,04	,00	,63	,14	,01	,09
	5	,011	23,887	,01	,01	,41	,00	,01	,72	,03
	6	,010	25,895	,00	,00	,40	,34	,52	,23	,00
	7	,006	33,484	,96	,12	,19	,02	,33	,04	,10

a. Dependent Variable: Q12 Total € price for reusable packaging (based on 5€)

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N

Predicted Value	4,7823	6,9063	6,0390	,37705	136
Residual	-1,47639	3,50930	,00000	,75822	136
Std. Predicted Value	-3,333	2,300	,000	1,000	136
Std. Residual	-1,903	4,524	,000	,978	136

a. Dependent Variable: Q12 Total € price for reusable packaging (based on 5€)

Appendix 8: Hypothesis 2.1 – SPSS output

Oneway ANOVA

Descriptives

Q7 How likely are you to use Loop?

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Male	41	3,59	1,224	,191	3,20	3,97	1	5
Female	93	3,91	,917	,095	3,73	4,10	1	5
Prefer not to say	2	3,50	,707	,500	-2,85	9,85	3	4
Total	136	3,81	1,022	,088	3,64	3,98	1	5

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Q7 How likely are you to use Loop?	Based on Mean	4,914	2	133	,009
	Based on Median	2,407	2	133	,094
	Based on Median and with adjusted df	2,407	2	125,110	,094
	Based on trimmed mean	5,021	2	133	,008

ANOVA

Q7 How likely are you to use Loop?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3,266	2	1,633	1,577	,210
Within Groups	137,763	133	1,036		
Total	141,029	135			

Robust Tests of Equality of Means

Q7 How likely are you to use Loop?

	Statistic[a]	df1	df2	Sig.
Welch	1,146	2	2,774	,434
Brown-Forsythe	1,809	2	12,032	,206

a. Asymptotically F distributed.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Q7 How likely are you to use Loop?

Tukey HSD

(I) Q13 Gender	(J) Q13 Gender	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Female	-,329	,191	,201	-,78	,12
	Prefer not to say	,085	,737	,993	-1,66	1,83
Female	Male	,329	,191	,201	-,12	,78
	Prefer not to say	,414	,727	,837	-1,31	2,14
Prefer not to say	Male	-,085	,737	,993	-1,83	1,66
	Female	-,414	,727	,837	-2,14	1,31

Univariate Analysis of Variance

Between-Subjects Factors

		Value Label	N
Q13 Gender	1	Male	41
	2	Female	93
	4	Prefer not to say	2

Tests of Between-Subjects Effects

Dependent Variable: Q7 How likely are you to use Loop?

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	16,166[a]	4	4,042	4,240	,003
Intercept	1,829	1	1,829	1,919	,168
Q13	,323	1	,323	,339	,561
Q2_3	12,572	1	12,572	13,190	<,001
Q13 * Q2_3	,392	1	,392	,411	,523
Error	124,863	131	,953		
Total	2114,000	136			
Corrected Total	141,029	135			

a. R Squared = .115 (Adjusted R Squared = .088)

Appendix 9: Hypothesis 3.1 – SPSS output

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,358[a]	,128	,102	,969	1,853

a. Predictors: (Constant), Q10_5 Rank influencing factors adoption - Hygiene of the containers, Q8_7 Agreement- I would trust the containers to be clean when I buy them, Q9_4 Evaluate attributes Loop- Hygienic:Contaminated, Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me

b. Dependent Variable: Q7 How likely are you to use Loop?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18,113	4	4,528	4,826	,001[b]
	Residual	122,917	131	,938		
	Total	141,029	135			

a. Dependent Variable: Q7 How likely are you to use Loop?

b. Predictors: (Constant), Q10_5 Rank influencing factors adoption - Hygiene of the containers, Q8_7 Agreement- I would trust the containers to be clean when I buy them, Q9_4 Evaluate attributes Loop- Hygienic:Contaminated, Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3,296	,761		4,333	<,001		
	Q8_7 Agreement- I would trust the containers to be clean when I buy them	,359	,133	,261	2,702	,008	,713	1,403
	Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me	-,014	,109	-,014	-,130	,897	,582	1,717

	Q9_4 Evaluate attributes Loop-Hygienic:Contaminated	-,172	,106	-,155	-1,627	,106	,734	1,362
	Q10_5 Rank influencing factors adoption - Hygiene of the containers	-,151	,066	-,194	-2,296	,023	,928	1,078

a. Dependent Variable: Q7 How likely are you to use Loop?

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Q8_7 Agreement- I would trust the containers to be clean when I buy them	Q8_8 Agreement- The fact that other people may have used the same container as me is off-putting to me	Q9_4 Evaluate attributes Loop-Hygienic:Contaminated	Q10_5 Rank influencing factors adoption - Hygiene of the containers
1	1	4,610	1,000	,00	,00	,00	,00	,00
	2	,240	4,381	,00	,01	,17	,09	,11
	3	,084	7,421	,00	,01	,50	,65	,10
	4	,058	8,931	,02	,12	,02	,23	,73
	5	,008	24,046	,98	,86	,30	,03	,06

a. Dependent Variable: Q7 How likely are you to use Loop?

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2,28	4,60	3,81	,366	136
Residual	-3,138	1,767	,000	,954	136
Std. Predicted Value	-4,163	2,173	,000	1,000	136
Std. Residual	-3,239	1,825	,000	,985	136

a. Dependent Variable: Q7 How likely are you to use Loop?

Appendix 10: Hypothesis 3.2 – SPSS output

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,199[a]	,040	,032	1,005	1,910

a. Predictors: (Constant), Q11 Max. Deposit amount in €

b. Dependent Variable: Q7 How likely are you to use Loop?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,584	1	5,584	5,525	,020[b]
	Residual	135,445	134	1,011		
	Total	141,029	135			

a. Dependent Variable: Q7 How likely are you to use Loop?

b. Predictors: (Constant), Q11 Max. Deposit amount in €

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	3,514	,152		23,100	<,001		
	Q11 Max. Deposit amount in €	,091	,039	,199	2,350	,020	1,000	1,000

a. Dependent Variable: Q7 How likely are you to use Loop?

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Variance Proportions Q11 Max. Deposit amount in €
1	1	1,824	1,000	,09	,09
	2	,176	3,219	,91	,91

a. Dependent Variable: Q7 How likely are you to use Loop?

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3,51	4,43	3,81	,203	136
Residual	-3,429	1,403	,000	1,002	136
Std. Predicted Value	-1,449	3,047	,000	1,000	136
Std. Residual	-3,410	1,396	,000	,996	136

a. Dependent Variable: Q7 How likely are you to use Loop?

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,495[a]	,245	,239	,891	1,858

a. Predictors: (Constant), Q8_2 Agreement - I am willing to pay a deposit for each returnable container

b. Dependent Variable: Q7 How likely are you to use Loop?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34,554	1	34,554	43,487	<,001[b]
	Residual	106,475	134	,795		
	Total	141,029	135			

a. Dependent Variable: Q7 How likely are you to use Loop?

b. Predictors: (Constant), Q8_2 Agreement - I am willing to pay a deposit for each returnable container

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	1,752	,321		5,454	<,001		
	Q8_2 Agreement - I am willing to pay a deposit for each returnable container	,526	,080	,495	6,594	<,001	1,000	1,000

a. Dependent Variable: Q7 How likely are you to use Loop?

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Variance Proportions Q8_2 Agreement - I am willing to pay a deposit for each returnable container
1	1	1,971	1,000	,01	,01
	2	,029	8,283	,99	,99

a. Dependent Variable: Q7 How likely are you to use Loop?

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2,28	4,38	3,81	,506	136
Residual	-3,381	1,722	,000	,888	136
Std. Predicted Value	-3,027	1,131	,000	1,000	136

Std. Residual	-3,793	1,932	,000	,996	136

a. Dependent Variable: Q7 How likely are you to use Loop?

Appendix 11: Hypothesis 3.3 – SPSS output

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,622[a]	,386	,368	,813	1,868

a. Predictors: (Constant), Q10_1 Rank influencing factors adoption - Convenience in daily life, Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic, Q9_3 Evaluate attributes Loop-Convenient:Inconvenient, Q8_5 Agreement - I could imagine using this concept on a regular basis

b. Dependent Variable: Q7 How likely are you to use Loop?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54,493	4	13,623	20,623	<,001[b]
	Residual	86,536	131	,661		
	Total	141,029	135			

a. Dependent Variable: Q7 How likely are you to use Loop?

b. Predictors: (Constant), Q10_1 Rank influencing factors adoption - Convenience in daily life, Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic, Q9_3 Evaluate attributes Loop-Convenient:Inconvenient, Q8_5 Agreement - I could imagine using this concept on a regular basis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,628	,601		1,045	,298		
	Q8_5 Agreement - I could imagine using this concept on a regular basis	,675	,115	,526	5,875	<,001	,584	1,711
	Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic	,174	,107	,131	1,616	,109	,710	1,408
	Q9_3 Evaluate attributes Loop-Convenient:Inconvenient	-,044	,077	-,045	-,574	,567	,749	1,336
	Q10_1 Rank influencing factors adoption - Convenience in daily life	-,046	,058	-,056	-,798	,427	,951	1,051

a. Dependent Variable: Q7 How likely are you to use Loop?

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Constant)	Q8_5 Agreement - I could imagine using this concept on a regular basis	Q8_6 Agreement - This concept sounds like it is a convenient solution against single-use plastic	Q9_3 Evaluate attributes Loop-Convenient:Inconvenient	Q10_1 Rank influencing factors adoption - Convenience in daily life
1	1	4,650	1,000	,00	,00	,00	,00	,01
	2	,207	4,743	,00	,00	,00	,23	,49
	3	,118	6,275	,00	,04	,03	,27	,47
	4	,015	17,421	,01	,61	,84	,02	,01
	5	,010	21,491	,99	,35	,13	,49	,02

a. Dependent Variable: Q7 How likely are you to use Loop?

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,25	4,73	3,81	,635	136
Residual	-3,687	1,463	,000	,801	136

Std. Predicted Value	-4,023	1,457	,000	1,000	136
Std. Residual	-4,536	1,800	,000	,985	136

a. Dependent Variable: Q7 How likely are you to use Loop?

Appendix 12: Hypothesis 3.4 – SPSS output

Oneway ANOVA

Descriptives

Q12 Total € price for reusable packaging (based on 5€)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No income	16	6,1438	1,01191	,25298	5,6045	6,6830	5,00	8,00
Less than €1500	31	6,0129	1,00391	,18031	5,6447	6,3811	5,00	10,00
€1500 - €2499	24	6,0208	,76782	,15673	5,6966	6,3451	5,00	8,00
€2500 - €3499	19	6,0895	,71250	,16346	5,7461	6,4329	5,00	7,00
€3500 - €4499	22	6,1818	,85892	,18312	5,8010	6,5626	5,00	8,00
More than €4500	22	5,9273	,68604	,14626	5,6231	6,2314	5,00	7,50
Total	134	6,0545	,84343	,07286	5,9104	6,1986	5,00	10,00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Q12 Total € price for reusable packaging (based on 5€)	Based on Mean	,497	5	128	,778
	Based on Median	,425	5	128	,831
	Based on Median and with adjusted df	,425	5	105,955	,831
	Based on trimmed mean	,458	5	128	,807

ANOVA

Q12 Total € price for reusable packaging (based on 5€)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,944	5	,189	,258	,935
Within Groups	93,668	128	,732		
Total	94,612	133			

Robust Tests of Equality of Means

Q12 Total € price for reusable packaging (based on 5€)

	Statistic[a]	df1	df2	Sig.
Welch	,284	5	56,177	,920
Brown-Forsythe	,262	5	107,991	,933

a. Asymptotically F distributed.

Oneway ANOVA

Descriptives

Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No income	16	3,50	1,211	,303	2,85	4,15	1	5
Less than €1500	31	3,35	,950	,171	3,01	3,70	2	5
€1500 - €2499	24	3,54	1,141	,233	3,06	4,02	1	5
€2500 - €3499	19	3,53	,964	,221	3,06	3,99	2	5
€3500 - €4499	22	3,41	1,054	,225	2,94	3,88	1	5
More than €4500	22	3,55	,912	,194	3,14	3,95	2	5
Total	134	3,47	1,016	,088	3,30	3,64	1	5

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Q8_4 Agreement - I would be willing to pay more for a product within the	Based on Mean	,445	5	128	,816
	Based on Median	,109	5	128	,990

Loop system compared to single-use plastic	Based on Median and with adjusted df	,109	5	122,573	,990
	Based on trimmed mean	,380	5	128	,861

ANOVA

Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,816	5	,163	,153	,979
Within Groups	136,565	128	1,067		
Total	137,381	133			

Robust Tests of Equality of Means

Q8_4 Agreement - I would be willing to pay more for a product within the Loop system compared to single-use plastic

	Statistic[a]	df1	df2	Sig.
Welch	,162	5	55,523	,975
Brown-Forsythe	,149	5	108,501	,980

a. Asymptotically F distributed.

Appendix 13: Hypothesis 3.5 – SPSS output

Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,046[a]	,002	-,005	1,025	1,881

a. Predictors: (Constant), Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact

b. Dependent Variable: Q7 How likely are you to use Loop?

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,293	1	,293	,279	,598[b]
	Residual	140,737	134	1,050		
	Total	141,029	135			

a. Dependent Variable: Q7 How likely are you to use Loop?

b. Predictors: (Constant), Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	3,956	,292		13,543	<,001		
	Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact	-,048	,092	-,046	-,528	,598	1,000	1,000

a. Dependent Variable: Q7 How likely are you to use Loop?

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions	
				(Constant)	Q8_10 Agreement- I still have a lot of questions about the process and sustainable impact
1	1	1,954	1,000	,02	,02
	2	,046	6,494	,98	,98

a. Dependent Variable: Q7 How likely are you to use Loop?

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N

Predicted Value	3,71	3,91	3,81	,047	136
Residual	-2,859	1,286	,000	1,021	136
Std. Predicted Value	-2,042	2,118	,000	1,000	136
Std. Residual	-2,790	1,255	,000	,996	136

a. Dependent Variable: Q7 How likely are you to use Loop?

Appendix 14: Exploratory research – SPSS output

T-Test

Group Statistics

	Q13 Gender	N	Mean	Std. Deviation	Std. Error Mean
Q2_1 Agreement - I am generally concerned with the protection of our environment	Male	41	4,24	,582	,091
	Female	93	4,56	,650	,067

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Q2_1 Agreement - I am generally concerned with the protection of our environment	Equal variances assumed	1,247	,266	-2,667	132	,004	,009	-,315	,118	-,549	-,081
	Equal variances not assumed			-2,784	84,943	,003	,007	-,315	,113	-,540	-,090

Independent Samples Effect Sizes

				95% Confidence Interval	
		Standardizer[a]	Point Estimate	Lower	Upper
Q2_1 Agreement - I am generally concerned with the protection of our environment	Cohen's d	,631	-,500	-,871	-,127
	Hedges' correction	,634	-,497	-,866	-,126
	Glass's delta	,650	-,485	-,857	-,109

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

T-Test

Group Statistics

	Q13 Gender	N	Mean	Std. Deviation	Std. Error Mean
Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	Male	41	3,98	,724	,113
	Female	93	4,31	,625	,065

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	Equal variances assumed	2,393	,124	-2,731	132	,004	,007	-,336	,123	-,580	-,093
	Equal variances not assumed			-2,579	67,439	,006	,012	-,336	,130	-,596	-,076

Independent Samples Effect Sizes

				95% Confidence Interval	
		Standardizer[a]	Point Estimate	Lower	Upper
Q2_4 Agreement - I intend to adopt more practices that are environmentally friendly in the future	Cohen's d	,657	-,512	-,884	-,138
	Hedges' correction	,661	-,509	-,879	-,138
	Glass's delta	,625	-,538	-,912	-,161

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

T-Test

Group Statistics

	Q13 Gender	N	Mean	Std. Deviation	Std. Error Mean
Q7 How likely are you to use Loop?	Male	41	3,59	1,224	,191
	Female	93	3,91	,917	,095

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Q7 How likely are you to use Loop?	Equal variances assumed	9,602	,002	-1,719	132	,044	,088	-,329	,191	-,707	,050
	Equal variances not assumed			-1,539	60,609	,065	,129	-,329	,214	-,756	,098

Independent Samples Effect Sizes

				95% Confidence Interval	
		Standardizer[a]	Point Estimate	Lower	Upper
Q7 How likely are you to use Loop?	Cohen's d	1,020	-,322	-,691	,048
	Hedges' correction	1,026	-,320	-,687	,048
	Glass's delta	,917	-,358	-,729	,014

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control group.

Oneway ANOVA

Descriptives

Q7 How likely are you to use Loop?

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Under 18	1	2,00	.	.	.	.	2	2
18 - 24	50	3,92	,986	,140	3,64	4,20	1	5
25 - 34	54	3,72	,998	,136	3,45	3,99	1	5
35 - 44	7	3,71	1,380	,522	2,44	4,99	1	5
45 - 64	21	4,00	,837	,183	3,62	4,38	1	5
65 - 84	3	3,00	2,000	1,155	-1,97	7,97	1	5
Total	136	3,81	1,022	,088	3,64	3,98	1	5

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Q7 How likely are you to use Loop?	Based on Mean	1,889	4	130	,116
	Based on Median	1,150	4	130	,336

	Based on Median and with adjusted df	1,150	4	124,243	,336
	Based on trimmed mean	1,357	4	130	,252

ANOVA

Q7 How likely are you to use Loop?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7,088	5	1,418	1,376	,238
Within Groups	133,942	130	1,030		
Total	141,029	135			

Oneway ANOVA

Descriptives

Q7 How likely are you to use Loop?

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No income	16	3,63	1,147	,287	3,01	4,24	1	5
Less than €1500	31	4,03	,752	,135	3,76	4,31	2	5
€1500 - €2499	24	3,92	1,060	,216	3,47	4,36	1	5
€2500 - €3499	19	3,63	1,116	,256	3,09	4,17	1	5
€3500 - €4499	22	3,68	1,287	,274	3,11	4,25	1	5
More than €4500	22	3,77	,922	,197	3,36	4,18	2	5
Total	134	3,81	1,029	,089	3,63	3,98	1	5

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Q7 How likely are you to use Loop?	Based on Mean	1,378	5	128	,237
	Based on Median	,413	5	128	,839
	Based on Median and with adjusted df	,413	5	111,203	,839
	Based on trimmed mean	1,046	5	128	,394

ANOVA

Q7 How likely are you to use Loop?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3,347	5	,669	,623	,683
Within Groups	137,608	128	1,075		
Total	140,955	133			

Robust Tests of Equality of Means

Q7 How likely are you to use Loop?

	Statistic[a]	df1	df2	Sig.
Welch	,721	5	54,191	,611
Brown-Forsythe	,589	5	103,527	,708

a. Asymptotically F distributed.

Oneway ANOVA

Descriptives

Q7 How likely are you to use Loop?

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Employed	74	3,73	1,064	,124	3,48	3,98	1	5
Retired	5	3,40	1,517	,678	1,52	5,28	1	5
Student	53	3,98	,888	,122	3,74	4,23	1	5
Other	4	3,50	1,291	,645	1,45	5,55	2	5
Total	136	3,81	1,022	,088	3,64	3,98	1	5

Tests of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.

Q7 How likely are you to use Loop?	Based on Mean	2,198	3	132	,091
	Based on Median	,969	3	132	,409
	Based on Median and with adjusted df	,969	3	122,246	,410
	Based on trimmed mean	1,541	3	132	,207

ANOVA

Q7 How likely are you to use Loop?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3,254	3	1,085	1,039	,378
Within Groups	137,776	132	1,044		
Total	141,029	135			

Robust Tests of Equality of Means

Q7 How likely are you to use Loop?

	Statistic[a]	df1	df2	Sig.
Welch	,819	3	8,731	,516
Brown-Forsythe	,674	3	11,069	,586

a. Asymptotically F distributed.

Oneway ANOVA

Descriptives

Q7 How likely are you to use Loop?

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Urban area	54	3,91	1,014	,138	3,63	4,18	1	5
Suburb	14	3,57	1,342	,359	2,80	4,35	1	5
Small town	36	3,81	,951	,158	3,48	4,13	1	5
Rural	32	3,75	,984	,174	3,40	4,10	2	5
Total	136	3,81	1,022	,088	3,64	3,98	1	5

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Q7 How likely are you to use Loop?	Based on Mean	1,419	3	132	,240
	Based on Median	,641	3	132	,590
	Based on Median and with adjusted df	,641	3	124,043	,590
	Based on trimmed mean	1,541	3	132	,207

ANOVA

Q7 How likely are you to use Loop?

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,425	3	,475	,449	,718
Within Groups	139,604	132	1,058		
Total	141,029	135			

Robust Tests of Equality of Means

Q7 How likely are you to use Loop?

	Statistic[a]	df1	df2	Sig.
Welch	,341	3	46,558	,796
Brown-Forsythe	,391	3	55,586	,760

a. Asymptotically F distributed.