# The impact of digital marketing on consumer behavior concerning sustainability in the field of plastic

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Submitted to PD Mag.phil. Dr.phil. Sabine Sedlacek

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# AFFIDAVIT

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# ABSTRACT

Over recent years, plastic waste has developed to become a problem for society and the environment. The properties of the material, that drove its widespread usage, such as mechanical strength, durability and low manufacturing costs, are also what make plastic a problem as waste – it is highly durable and takes a long time to degrade. When it degrades, it breaks down to so called micro-plastics, that can be found virtually everywhere on earth. Problems arising from these micro plastics have not yet been researched thoroughly. Waste treatment presents another problem, as recycling of plastic only happens for less than 10% of plastic waste, while the production of the material has continually increased over the last 70 years. While the problem of plastic waste has grown over recent decades, so have the possibilities of marketing and innovative digital solutions have come up, that present rather cost-effective ways to reach a wide audience when it comes to influencing consumer behavior. In this way, digital marketing presents one possibility to tackle the problem of plastic waste by influencing consumer behavior to reduce plastic waste generation.

This thesis looks at the problem of plastic waste through application of an interdisciplinary approach, that combines the domains of sustainability, consumer behavior and marketing in the form of digital marketing. Quantitative data is gathered from an online survey, that utilizes different types of digital marketing to communicate the issues of plastic waste. The gathered data is used to draw conclusions whether digital marketing is a fitting tool to foster change in consumer behavior toward more sustainable consumption in society.

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**SUP** – Single Use Plastics

**PVC** (Polyvinyl chloride)

**PMMA** (Polymethyl methacrylate)

**PE** (Polyethylene)

**PET** (Polyethylene Terephthalate)

**PUR** (Polyurethane)

**PS** (Polystyrene)

**PP** (Polypropylene)

# 1 INTRODUCTION

Over the course of the last century, plastic has seemingly been established as the most widespread packaging material in modern society. The material has a vast array of properties, such as good mechanical strength, strong dimensional abilities and various others, which make it a suitable packaging solution for almost any product, may it be groceries or medical equipment, making the substance present in virtually any surrounding (Subramanian, 2019). Despite the useful properties the material has, the ever-increasing production of plastic for one-time use, results in extremely high amounts of plastic waste as a consequence. Especially the properties that make it such a good choice for packaging, make it a problem as waste, since it can persist for an incredible long time in our environment without degrading (Subramanian, 2019). Hence, the material increasingly pollutes our planet and harms the environment as well as society where many consequences cannot even be anticipated at this point in time. This clearly points out, that such a problem should be a decision factor for consumers, when buying any plastic packaged goods.

Previous research has already pointed out, that factors concerning sustainability can have an impact on consumers when making purchasing decisions. Antonetti & Maklan (2014) found that based on past experiences negative as well as positive emotions can influence decision making toward a more sustainable direction. The same research also reveals that stable beliefs of consumers have a great impact on their consumption, which indicates that consistent application of digital marketing should positively influence consumption patterns towards buying less plastic packaged products through inducing a more sustainable mindset. Another aspect that could be leveraged to alter consumer behavior, could be based on the research of Ajzen (1991), where it is identified that behavior is guided by three main components: social influence, issues of control and attitude. Considering these elements, a person will perform a certain action if the person feels able and has the means to perform it, they feel social pressure to behave in this certain way and they feel positive towards this action, which indicates that knowledge and information play a role in consumer behavior.

## 1.1 Research aims and objectives

This study aims to analyze the relationship of digital marketing and sustainability in consumer behavior with an emphasis on plastic packaging. The thesis first tries to clearly establish the problem of plastic waste for society and the environment**.** Then the consumers stance towards sustainability in packaging is investigated while ultimately analyzing whether it is possible to influence a consumers opinion concerning the topic, by leveraging digital marketing tools. Based on this aim, the following research questions arise:

- RQ 1: Can digital marketing induce behavioral change in consumers towards a reduction of plastic waste?
- RQ 2: Which form of digital marketing has the highest impact on buying decisions in terms of plastic packaging?

## 1.2 Structure of the thesis

This thesis consists of a literature review, that first establishes the topic of plastic and provides a deeper understanding of the issues that are caused by plastic waste and the materials properties. The next part of the literature review elaborates on relevant consumer behavior theories that analyze how consumer behavior is driven based on different elements. These theories are analyzed in detail so that the identified elements can be leveraged for this research. The last part of the literature review discusses the realm of digital marketing, where first a definition of digital marketing is established and then the different types are discussed. Within the chapter of the literature review, a conceptual framework is developed that brings together the theories identified in the literature and explains how these theories are utilized to answer the research questions.

Quantitative research will be applied as the key research method to gather relevant data to answer the research questions. This will be done through an online survey, developed based upon the concepts that are identified the literature review. The survey will contain questions utilizing different types of digital marketing that each focus on elements stemming from consumer behavior theories.

In the last part of this thesis the results obtained from the survey will be analyzed and used to answer the research questions based upon hypotheses testing through SPSS. This will be followed be a discussion of the results, limitations of this study and implications for further research.

# 2 LITERATURE REVIEW

In this chapter the core concepts for this thesis are explained by providing an in-depth literature review on the topic of plastics, consumer behavior and digital marketing. These insights will provide the basis for the further research that will show how the concepts interact with each other and in this way, help answering the research questions.

## 2.1 Plastics as an environmental problem

This section aims to introduce the topic of plastics by providing a definition of what is understood under the term plastic, an overview of the history of the material, elaborating on the properties which enable its multifaceted industrial use and through discussing what makes it problematic to the environment.

### 2.1.1 Definition of plastic

As the term plastic is used in many contexts and throughout different industries, it can be challenging to understand what the word plastic encompasses. The word “plastic” at its core refers to materials which can be shaped or molded through the application of pressure or heat(Rodriguez, 2020). The term itself is derived from the Greek word “plastikos” meaning “capable to be formed”, which can be considered one of the main attributes of any type of plastic, allowing it to be formed into a multiplicity of shapes (PlasticsEurope, 2021). Plastic materials, or plastics, are produced through polymerization, which describes an array of chemical reactions on raw materials like crude oil and natural gas. Different techniques of polymerization enable plastics manufacturers to produce plastics with various properties: flexible or stiff, soft or hard, opaque or transparent (Heinrich Böll Foundation, 2019).

In the modern world, two main types of plastics can be identified: thermoplastics and thermosets. Thermoplastics are a group of plastics which soften or melt when heat is applied and can therefore be reshaped repeatedly. Most plastics that are manufactured and sold on the market belong to the group of thermoplastics. In contrast to thermoplastics, thermosets undergo a chemical change when they are heated and thus they cannot be re-melted and reformed (PlasticsEurope, 2020). As thermosets differ from thermoplastics at their underlying chemical structure, recycling is a difficult task. In order to recycle thermosets, chemical processes to split the plastics to its fundamentals and then relink them, need to be applied. This fact, makes recycling thermosets economically unviable (Ayre, 2018).

In the following table an overview of different plastics in each group is presented:

| Thermoplastics | Thermosets |
|---|---|
| PE (Polyethylene), Low-Density PE (PE-LD/LDPE), Linear Low-Density PE (PE-LLD/LLDP), Medium-Density PE (PE-MD), High-Density PE (PE-HD/HDPE) (Stoifl et al., 2017) | PUR (Polurethane) |
| PP (Polypropylene) | Silicone |
| PVC (Polyvinyl chloride) | Epoxy resins |
| PET (Polyethylene Terephthalate) | Vinyl |
| PS (Polystyrene) & EPS (Expanded Polystyrene) | Unsaturated Polyester |
| PMMA | Acrylic Resins |

TABLE 1 OVERVIEW OF PLASTIC TYPES BY GROUP (PLASTICSEUROPE, 2020)

Thus, it can be reasoned that the general word plastic does not simply refer to one specific material, but rather to a wide array of materials that share similar properties and are made from similar chemical substances. This fact implies, that applying the term “plastics”, is a better fitting phrase when referring to materials that belong to this group. Hence this term will be used further on in this thesis when no specific type of plastic is meant.

### 2.1.2 History of plastics

In the modern world, it is common knowledge, that society is facing an environmental problem caused by the overuse of plastics. While on the one hand it appears to be hardly possible to find products not packaged in any plastics when grocery shopping, on the other hand the awareness, that this is a problem, appears to be increasing. It seems unimaginable, that most products that are nowadays being packaged in plastics, were once available without creating any plastic waste.

The first type of plastics was invented in 1833 by Henri Braconnot in France. So called nitrocellulose was then used to produce billiard balls, but as it was based on cellulose this type of plastic was quite different to plastics as it is known today. In 1909, the first synthetic plastic, called Bakelite, was developed by Leo Hendrik Baekeland, who was also the first person to use the term plastic in this context (Chalmin, 2019). The most significant developments in the plastics industry were made in the early and middle 20$^{th}$ century (Chalmin, 2019), where especially the second world war helped propelling the development of many types of plastics and its widespread usage later on (Crawford & Quinn, 2017).

An historical overview of the most used types of plastics is presented in the following paragraph:

- **PVC** (Polyvinyl chloride) was discovered in 1912 and large-scale industrial production started in 1930. Initially it was used a substitute for natural rubber, but soon many more

use cases were found based on its properties like non-flammability, durability, humidity resistance and usability for insulation. Today it is used in the building and construction sector for piping, window profiles, flooring and wall coverings, in the electricity sector for cable insulation, in the packaging sector, for bank and credit cards, in the automotive industry, in the medical sector, the consumer goods sector and more. For a short while PVC was also used for food packing, but after it was discovered, that it had toxic properties, bad publicity led the PVC industry to give up on the sector of food packaging. The material has become the second most used and produced plastic which can be accounted to its application in highly specialized products as well as in everyday household goods (Mulder & Knot, 2001).

- **PMMA** (Polymethyl methacrylate) was created in 1924 and went into mass production starting in 1934 under the name of "Plexiglas". Its wide array of application includes illuminated signs, furniture and touchscreens (Chalmin, 2019).
- **PE** (Polyethylene) was discovered in 1933 and had its industrial breakthrough in 1942. The many types of PE include PE-HD, PE-MDF, PE-LD and PE-LLD and make it the most produced and used type of plastic with applications in virtually every sector but especially packaging and plastic storage products (Chalmin, 2019). In 1946, Tupperware, which is made from polyethylene, was developed and contributed greatly to the rising popularity of plastics (Crawford & Quinn, 2017).
- **PET** (Polyethylene Terephthalate) was developed in late 1950 and initially used as a film for video and photographic applications, but also for flexible packaging. Later modification of the material enabled it to be used for blow-molding to produce three dimensional structures. This resulted in enormous usage for the production of bottles, as the material possess glass like properties, but is lightweight as well as unbreakable (De Cort et al., 2017).
- **PUR** (Polyurethane) was created by Dr. Otto Bayer in 1937 (Chalmin, 2019) and is used in pillows, mattresses, insulating foams for fridges as well as in building insulation (PlasticsEurope, 2020).
- **PS** (Polystyrene) was created in 1938 and was and still is used for production of plastic cups, trays and food packaging. Through further developments, it was discovered that it provides the base to produce a foam like material called expanded polystyrene (**EPS**) (Chalmin, 2019), which is used for manufacturing insulating material for buildings as well as for insulating material for fridges and packaging (PlasticsEurope, 2020).
- **PP** (Polypropylene) is a plastic material that can withstand chemicals and temperatures above 100°C (Chalmin, 2019). It was discovered in 1951 by two scientists working for the oil company Phillips Petroleum in the US (Crawford & Quinn, 2017) and is used for food packaging, microwave containers, pipes, bank notes, car parts, sweet and snack wrappers etc. (PlasticsEurope, 2020).

After these plastics had emerged and were industrialized throughout the middle 20th century, worldwide plastic production increased dramatically, before then plastics could only be considered a niche market. Through its advantages, like low electrical conductivity, transparency and toughness (Rodriguez, 2020), society developed a positive image of plastics, which helped the boom of the plastics industry and soon the material made it into virtually all areas of life (Heinrich Böll Foundation, 2019). Initially plastic was positioned and marketed as a high-quality material but developed to be used for single-use products and packaging material to a high percentage. Plastics were first treated with respect, just like glass and other higher quality packaging materials, but after manufacturers discovered plastics as a cheaper option for packaging, the throw-away culture was born. In 1978, Coca Cola replaced its famous glass bottle with a single-use PET plastic bottle which symbolizes a paradigm shift to throwaway packaging. By the end of the 1980s most reusable bottles had been replaced with plastics, while society in the western world still believed that recycling would be able to manage all waste generated by the SUPs.

With this development, throw-away culture and SUPs become a symbol of modernity and started spreading to developing countries as well. In the years after 1980, SUPs made it into many areas of life especially in the area of food: pre-made plastic packaged dinners, single-use plastic bags, plastic utensils to eat takeout food, plastic straws, plastic cups for parties and events, takeaway coffee cups and various others. Widespread usage of single-use plastics enabled a "convenience lifestyle" where everything can be procured, consumed and be disposed of rather quickly. This fact has contributed to forming the modern lifestyle and created a feeling that throwing away products right after consumption is normal (Heinrich Böll Foundation, 2019).

Underlying to the phenomenon of mass adoption of plastics, Meikle (1995) argues that this process was more commercially driven, than based on scientific breakthrough. This implies that, the core motivator, that brought plastics into all areas of life, is capitalism. Plastics played an enabling role in mass production and mass consumption with its properties of being lightweight, formable, easy and cheap. The production infrastructure of the world adapted based on the usage of plastics and has gotten to a point, where it is hardly possible to replace plastics (Davis, 2015). In the modern world, plastics have become indispensable.

This fact stands in stark contrast to pre plastic packaging times, where packaging was produced to last and could be reused and returned. Back then, vegetables were sold loose, meat was wrapped in paper by the butcher (Heinrich Böll Foundation, 2019), milk and oil were sold in glass bottles, toiletries were packaged in paper or glass, toothpaste came out of metal tubes – now all these and many other items are almost exclusively available within plastic packaging (United Nations Environment Programme, 2018).

As can be seen in Figure 1, worldwide plastics production increased at an enormous rate since 1950. Between 1950 and 1976 it increased twentyfold and until 2002 almost quadrupled again. Since then, production increases slowed down but still almost doubled from 2002 until 2019.

Over recent years, most of the worlds plastics has been produced, where just from 2000 until 2019, more than half of the world's plastic was produced (Heinrich Böll Foundation, 2019). This data illustrates the dramatic developments in the plastics industry since its inception and also implies that the increase in plastics production must have led to an increase in waste.

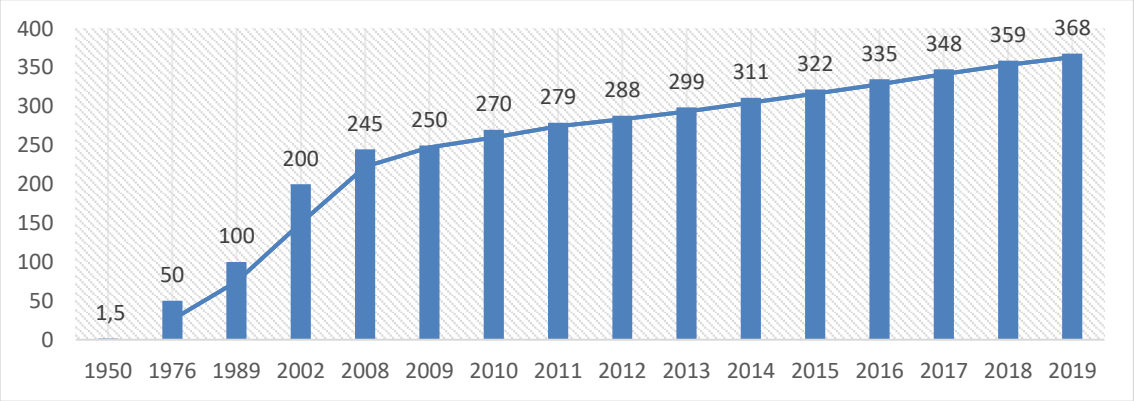


FIGURE 1 WORLDWIDE PLASTICS PRODUCTION IN MILLION TONS EXCL. PET, PA AND POLYACRYL FIBERS (PLASTICSEUROPE, 2020)

### 2.1.3 The plastics market

The global plastics market is made up from different actors in terms of production, consumption and market segments. In Figure 2, the production distribution per region is illustrated. This data indicates that, China is, by far, the country with the highest production, followed by the NAFTA region and in third place the rest of Asia. Overall, Asia accounts for 51% of the global plastics production and Latin America, the CIS region and the Middle East + Africa only account for a total of 14% of the global production. When comparing this to the usage of single-use plastics, Asia accounts for 38%, North America for 21%, Europe for 16%, CIS for 3%, Africa for 1%, Latin America for 4% and the Middle East for 17% (Heinrich Böll Foundation, 2019). This implies that the Middle East either imports much of the plastics that are consumed or most of its production goes into single-use plastics.

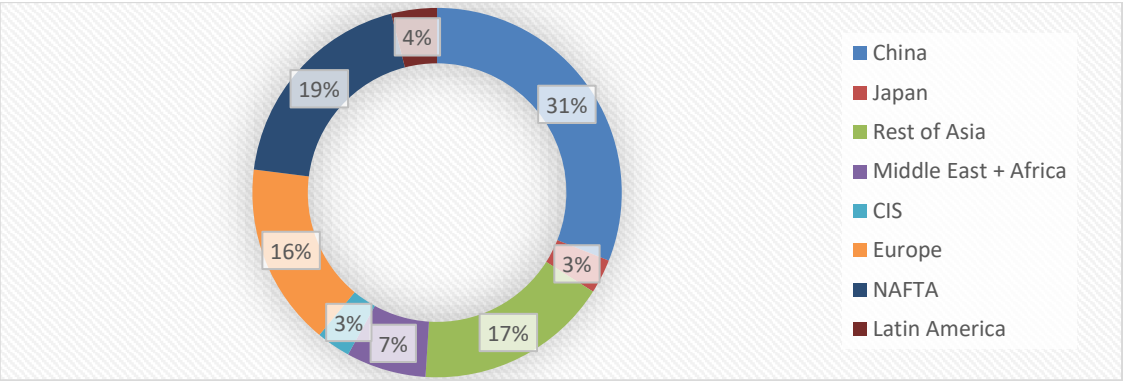


FIGURE 2 PLASTICS PRODUCTION BY REGION (PlasticsEurope, 2020)

As laid out in section 2.3.1, the plastics market is made up from various different types of plastics that have different use cases, based on their individual properties. In the following graph, Figure 3, an overview of the distribution of the production of plastics is presented. The most produced plastics are Polyethylene plastics (LDPE, LLDPE, HDPE), Polypropylene, and Polyvinyl chloride, which in total make up 71% of the total plastics production. These types of plastics are most used in the packaging and construction sector, which matches with the distribution of plastics produced per market segment in Figure 4.

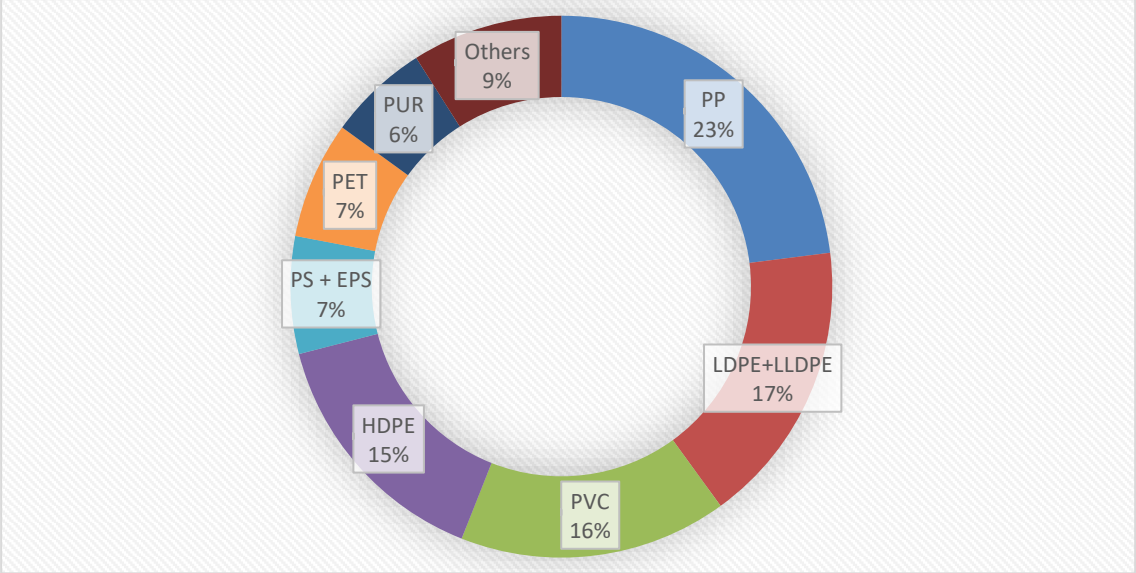


FIGURE 3 DISTRIBUTION OF PLASTICS PRODUCTION BY TYPE WORLDWIDE (Britt, 2019)

With the exception of PUR and few others, all of these plastics have many use cases in the packaging industry and especially for food packaging (World Economic Forum et al., 2016).

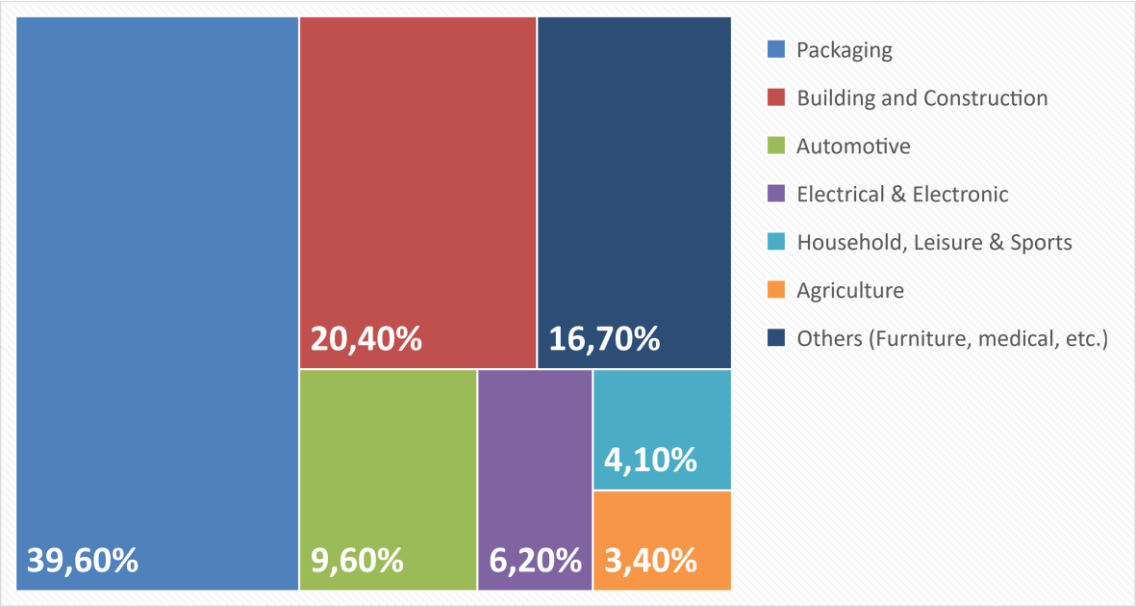


FIGURE 4 PLASTIC DEMAND BY MARKET SEGMENT IN EUROPE IN 2019 (PlasticsEurope, 2020)

In Europe the total plastics demand in 2019 amounted to 50.7 million tons (PlasticsEurope, 2020). Figure 4 illustrates the distribution of this amount to different segments, where packaging and building & construction clearly represent the biggest markets. This distribution depicts,

that most problematic segment, is also the biggest segment when it comes to plastics. Figure 5 shows the average lifetimes of plastics in different market segments. As the packaging sector amounts to almost 40% of total plastic usage, an average lifetime of just 0,5 years indicates that it is likely that the highest amount of plastic waste originates from plastic packaging. Under the assumption, that all of the packaging produced in Europe was sold in the same year, this means that with a lifetime of only 0,5 years, approximately 20,23 million tons of plastics waste were generated by packaging alone.

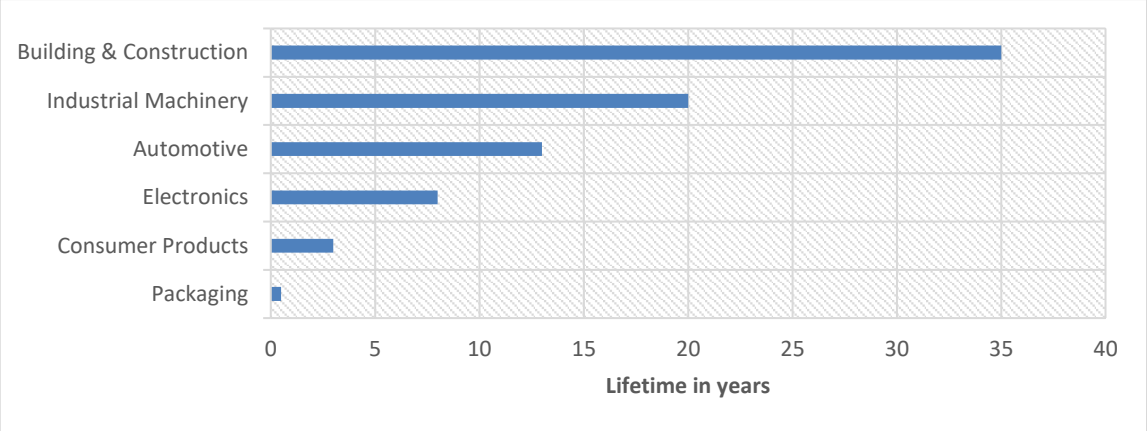


FIGURE 5 AVERAGE LIFETIME OF PLASTICS (Geyer et al., 2017)

### 2.1.4 Problems with plastics

As plastics experienced extreme growth and have made their way into most areas of life within the last 70 years, many significant problems with the material have arisen. The main benefit of plastic, its durability, is also what makes it such a big problem, it persists. This makes managing plastic waste an important task, especially considering, that plastics can be found in almost all places on earth already (Heinrich Böll Foundation, 2019). In this way, one problem that can be identified by looking at market data, is that by having such a low lifetime but high production volume, plastic packaging can be clearly considered as a major source of waste and needs attention.

Substantially, three ways of handlings plastic waste can be identified. First, disposal of plastics in landfills, either in contained systems or uncontained in dumps open to the surrounding environment. With approximately 60% of all plastic that was ever generated, being dumped in a landfill, this method represents the most used way of how plastics are disposed of. Especially open landfills are problematic, as environmental impact weakens the contained plastics and causes the degradation into small particles, so called “microplastics” (Geyer et al., 2017). Second, disposal of plastics through incineration. The environmental and health impact of this process heavily depends on incinerator design, operation and emission control technology. Approximately 12% of plastic waste has been sent to incineration. The third way plastic waste can go is to be recycled. Recycling can be considered to only delay the final disposal of plastics, as the recycled material does not replace primary plastics production, because of lower economic

value than that of primary plastics. Only 9% of all plastic waste has been recycled (Geyer et al., 2017).

Another major problem that can be identified is greenwashing[1] by companies in the plastics industry. Many companies involved in the production of plastics are owned by petrochemical companies, which supply the raw material needed to produce plastics. This double involvement in the industry, where the supplier owns the producer is called vertical integration and logically provides a financial benefit for such companies to keep production constant or even increase it (Break Free From Plastics, 2020b). Despite the known environmental problems, caused by the material, the industry still invests heavily into manufacturing plants and further increasing production capabilities. Cheap gas in certain regions of the world has only resulted in further investments by petrochemical companies to reap the benefits of this circumstance and will add to the increasing productions worldwide (CIEL, 2017). Yet these companies put the sole blame for the problem on the consumer by advertising plastic waste generated through consumer behavior as the major source of the problem. Recycling is advertised as the solution while waste management cannot handle the amounts of waste that is generated by the ever increasing production (Heinrich Böll Foundation, 2019). This in turn also puts blame on governments for not being able to provide sufficient infrastructure that can cope with the amounts of waste (Break Free From Plastics, 2020b), while on the other hand the plastics industry lobbies against new regulations against single-use plastics that would decrease the overall waste amount (Changing Markets Foundation, 2020). Recycling rates vary from country to country, but even advanced recycling systems are not able to recycle most plastics, because by design it is just not possible (Break Free From Plastics, 2020b).

A different tactic used by plastics producing companies is delaying regulations by joining voluntary commitments. To policymakers and the public this gives the impression that companies are committed towards making moves in the right direction without regulations being put into place. For governments this is often a preferable solution as it is in line with free market principles and is considered to not suppress innovation (Changing Markets Foundation, 2020). While actually committing to such a goal would be a good tool for companies to reduce negative environmental impacts, in the plastics industry this can be considered just another form of greenwashing. Companies that have joined such a commitment often use it as marketing tool to paint a false picture, but rarely make actual progress towards tackling environmental problems, while

[1] Greenwashing is defined by Becker-Olsen & Potucek (2013) as "Greenwashing refers to the practice of falsely promoting an organization's environmental efforts or spending more resources to promote the organization as green than are spent to actually engage in environmentally sound practices. Thus, greenwashing is the dissemination of false or deceptive information regarding an organization's environmental strategies, goals, motivations, and actions." (p. 1318).

still benefitting from the positive impression such a commitment makes (Break Free From Plastics, 2020b). This is illustrated when looking at data from plastics producing companies like The Coca-Cola Company, Nestlé and PepsiCo: The Coca-Cola Company produces around 3 million Tons of plastic packaging per year, of which only 9.7% are made from recycled plastics and only 3% are reusable, Nestlé produces around 1.5 million Tons each year of which only 2% come from recycled plastics and only 1% is reusable, PepsiCo produces 2.3 million tons of which 4% come from recycled plastics and 0% are reusable (Ellen MacArthur Foundation, 2020).

In order to appear more environmentally friendly, companies in the plastics industry have further started using bio-based plastics for packaging production. They are selling their packaging under the terms “eco”, “green” or “bio” and market the items as “biodegradable”, while these plastics are not necessarily better for the environment (Greenpeace, 2019). Bio-based plastic is defined as plastics made from renewable sources like plant-based material from corn, sugar beet or sugar cane and has similar properties as traditional plastics (European Bioplastics, n.d.). Not only are these plastics mostly made from fossil-based plastics and hence not 100% from renewable resources, but they also still hardly degrade under natural conditions. If degradation does take place, the process is similar to traditional plastics and results in the break down to small pieces that include microplastics. When looking at plastic that is marketed as compostable, this is true only under conditions met in industrial composting facilities or home composting (Naraya & Pettigrew, 1999). For municipalities this presents a problem, as many do not have industrial composting facilities and as recycling of such plastics is barely possible, the plastics still mostly get landfilled or incinerated (Greenpeace, 2019).

Taking a look at measures by The Coca-Cola Company, there are various initiatives published on its website like water stewardship, actions for more environmental packaging, recycling and collection programs, social commitment and more (The Coca-Cola Company, 2021). In the public eye and even to policy makers, this may communicate the picture of a company committed to bettering their impact on the environment, but when comparing this with real numbers and facts as outlined in the paragraph above, little to no actual progress can be identified.

As such large amounts of plastics waste are generated, plastics also makes its way onto fields and hence into our agricultural and food system. Many supermarket foods are packaged in plastics, from cucumbers and pre-cut salad, over ready to eat meals to countless other food items. Since the packaging industry has been identified as an industry causing much of the worlds plastic waste, this only highlights this fact once more. The fast-paced lifestyle of the modern world, where many people live in cities and eating habits are adapting to this, boosts food packaging industry and cause more sales and production (Heinrich Böll Foundation, 2019). The global market value, of the food packaging industry in 2019 amounted to 303.26 billion USD in 2019 (Grand View Research, 2020a) and is estimated to grow to 456.6 billion USD by 2027 (Grand View Research, 2020b), illustrating the immense size of this market segment. It is estimated that approximately one third of the plastics produced each year end up in inland waters or in the soil,

where the plastic then breaks down to microplastics polluting the environment. In addition to this, more microplastic gets into our natural surroundings by the application of sewerage as fertilizer. Wastewater treatment systems are only able to filter around 90% of microplastics out of wastewater while the rest goes into the sewerage that is partly used as fertilizer. Plastics can be found in remote parts of the Alps as well as in the deepest depths of the ocean, meaning that there is virtually no place on earth's surface, without plastic particles (Heinrich Böll Foundation, 2019). While the possible effects of microplastics on the human body have yet to be further researched, studies have revealed that we may ingest up to 5 grams of plastic every week (Senathirajah & Palanisami, 2019) and when drinking a lot of bottled water we could ingest around 140 000 of microplastic particles (Cox et al., 2019).

It is certainly true, that consumer behavior also plays an important role in the generation of plastic waste, as over the last few decades the throw-away convenience lifestyle has established itself in the minds of the consumer (Heinrich Böll Foundation, 2019). Through the establishment of many items, that are destined, to be used just once and then thrown into the trash, it can be argued, that this idea was formed by the market not necessarily by the consumer himself. As more and more items of this category started appearing, outlined in section 2.32, the behavior of the consumer adapted to these products. This implies, that the consumer is an important touchpoint to foster change when it comes to the usage of plastic products. Especially when considering plastic packaging with a lifetime of less than one year. Now education and policies are important to change this system (Break Free From Plastics, 2020b). Less demand for plastic products, means less usage and ultimately means less plastics will be produced.

An ever-increasing number of people shop online and so a significant shift of purchases has moved from brick-and-mortar stores to e-commerce orders. In contrast to traditional in store purchasing, this type of shopping requires additional packaging and hence creates more plastic waste, as this packaging usually also consists of single-use plastics. Through a lack of alternatives in terms of costs and alternative materials, these plastics are dominating the packaging market and keep adding to generating more plastic waste. (Heinrich Böll Foundation, 2019). A factor adding to this circumstance has been the COVID-19 crisis. E-commerce orders within the EU increased by 30% in April 2020 compared to the prior year while sales in retail stores fell by 17.9%, with similar developments in regions like the UK, the US and China. Google searches for "food delivery" over OECD countries almost doubled as a result of lockdown measures (OECD, 2020) and orders of prominent delivery providers like Delivery Hero and Takaway.com increased by over 90% and over 30% respectively (Delivery Hero, 2020; Just Eat Takeaway.com N.V., 2020). This trend is believed to shape the future, as many people who had not been involved with e-commerce before the pandemic, are now likely to shift their shopping behavior to e-commerce as well as increasingly order food through delivery options online (OECD, 2020).

A fitting statement, describing many problems cause by plastics at once, has been made by Davis (2015), “Plastic—in its production, distribution, and waste cycles—represents the inevitable corollary to unfettered economic growth: it is both intensely resource-depleting (eight percent of world oil production goes into the manufacture and production of plastics) and ecologically devastating. Indeed, plastic brings together some of the most abiding environmental concerns of our time because of its pervasiveness, banality, and longevity.” (p. 350)

## 2.2 Consumer Behavior

**The Theory of planned behavior**

This theory assumes that, commonly people behave in a sensible way, based on considering information available to them and in this way contemplating the outcome of their actions. Ultimately, the intention to perform a certain behavior is the key determinant of a specific action (behavior) (Ajzen, 1991).

The theory of planned behavior incorporates three core elements as foundation for intentions and behavior. These elements are based on social influence, based on issues of control and based on the personal attitude toward a certain behavior. Specifically, this attitude describes a person’s positive or negative assessment of behaving in a certain way. The element of social influence describes how much social pressure a person feels when it comes to behaving in a certain way. As this element is based upon social norms, it is called subjective norm within the framework of the theory. The third element, control, describes the extent a person feels that they have the ability to behave in a certain way. Within the context of the theory, this element is described as perceived behavioral control. In Figure 6, the interaction of these elements leading to a certain outcome is outlined (Ajzen, 2005).

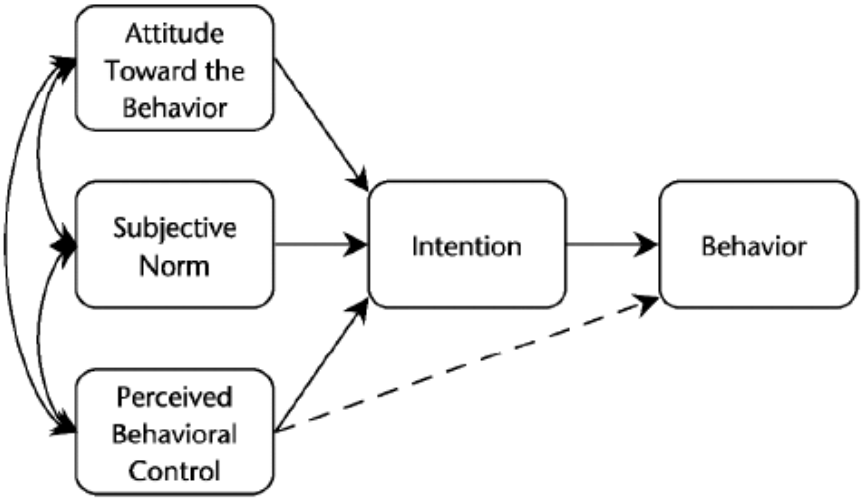


FIGURE 6 THEORY OF PLANNED BEHAVIOR (Ajzen, 2005, p. 118)

Considering all these elements, a person will perform a certain action when the person experiences a positive feeling toward the outcome, has the means and the capability to perform it and experiences social pressure to execute a certain behavior. The theory takes into consideration, that the three underlying elements, attitude toward the behavior, subjective norm and perceived control, vary based on the intention that is investigated. This assumption implies that, for certain intentions, the attitude toward the behavior may be more important while for other intentions, the subjective norm might play a more important role. Likewise, the factor of perceived behavioral control is presumably more important for different intentions. It is also possible, that for certain intentions only one or two of the influential factors might be relevant. Accordingly, the varying importance of the factors also holds true for different persons and populations (Ajzen, 2005) . Notably, the factor of perceived control takes into account the real-world constraints that might exist when deciding upon a certain behavior. The control factor has two features in the theory. Firstly, it plays a role in the motivational process towards an intention where if people believe they do not have the resources to perform a behavior, they are unlikely to undertake it even when their attitude is positive and social pressure is present. Secondly, there is a direct connection to behavior, as control may be used to predict behavior directly. This is represented through a direct link between behavior and control in Figure 6. For situations, where an individual has little to no knowledge about a behavior the factor of control cannot be considered a reliable predictor of the outcome and is hence represented by a dashed line in Figure 6 (Ajzen, 2005).

**Guild and pride can guide behavior**

Research conducted by Antonetti & Maklan in 2014 suggests that, guilt and pride can play a role in consumers sustainable consumption decisions and patterns. The studies explore the impact of past sustainable consumption experiences on consumers beliefs, that such choices are effective in tackling environmental issues. A core element of the research is perceived consumer effectiveness (PCE) [2] and intentions to purchase sustainable products in light of the variables guilt and pride. The first study carried out as an online experiment, analyzes three hypotheses (Antonetti & Maklan, 2014, p. 123):

**H1:** The experience of guilt and pride after an ethical purchasing situation will lead to future intentions to engage in sustainable consumption.

[2] The term "Perceived Consumer Effectiveness" is described by Hanss & Doran (2020) as "The term perceived consumer effectiveness (PCE) broadly refers to a consumer's level of confidence in being able to bring about outcomes that he or she personally values and wants to achieve. It is one of the personal characteristics that has been assigned an influential role in psychological theories of consumer behavior. Support for the assumed impact of PCE on consumer behavior comes from multiple studies that have found PCE to be positively associated with consumer contributions to sustainable development" (p. 535).

**H2:** The experience of guilt and pride after an ethical purchasing situation will influence PCE positively.

**H3:** PCE influences future intentions to engage in ethical consumption and mediates the impact of guilt and pride on behavioral intentions.

The findings in this first study imply that emotions like guilt and pride play a role when consumers make sustainable consumption decisions confirming H1. Further, the researchers were able to confirm H2 and H3 as well, showing that there are significant impacts on sustainable consumption stemming from the analyzed emotions. Additionally, it was identified, that self-conscious emotions are a motivational factor when people decide whether to opt for sustainable products, which demonstrates the likelihood of changing consumers beliefs through focusing on these emotions. The researchers argue that those emotions do not directly influence behavior, but rather the individual sense of agency and hence affect future outcomes. After facing negative emotions and ethical dilemmas that came with previous purchasing decisions, consumers' find it harder to rationalize or justify future decisions and in this way learn that, their actions do make a difference in the promotion of sustainability (Antonetti & Maklan, 2014).

**Socially conscious consumerism**

A systematic review carried out by Cotte & Truedl in 2009, with the aim of elaborating on consumer behavior in terms of socially conscious buying behavior provides information on the willingness of consumers towards a shift to more sustainability. Through analysis of 91 studies published between 1970 and 2009, the research has come up with important insights into the field. First, surveys have been identified to be a dominant research method in the field. Typically, such surveys ask consumers to self-report attitudes and behavior. There are several issues that arise when researching this way. First, consumers feel pressured to answer in the socially desired way, where it has been found, that especially if the theme of research is sustainability, consumers are more likely to agree with statements. Second, when stating the willingness to pay more, there is no risk involved in a survey, but in reality, consumers might not really be willing to pay more. Third, when assessing behavior, a survey can hardly include other phenomena of the market e.g., a consumer may be answering truthfully when responding that they are willing to pay premium for sustainable products, but because of misleading labelling in the store end up not making a sustainable choice. These reasons resulted in a so called attitude-behavior-gap, which describes the phenomenon that, consumer attitude towards ethical products might be high but purchasing behaviors towards such products is not (Cotte & Truedl, 2009). Important results in terms of willingness to change behavior and willingness to pay a premium were derived from the systematic review. The results were split into three categories, based on questions where actual behavior was tested "I bought fair trade coffee", intention was tested "I am willing to pay a premium" and attitude was tested "I believe buying local food is good for the environment".

When looking at actual behaviors, 88% were willing to change behavior, but only 44% were willing to pay a premium. Considering intentions, 94% were willing to change their behavior and 61% were willing to pay a premium. Lastly looking at attitudes, 39% were willing to change their behavior but only 9% were willing to pay premium. (Cotte & Truedl, 2009)

## 2.3 Digital Marketing

### 2.3.1 Definition

As digital marketing is based upon technology, it can be generally considered as an ever evolving concept (Wymbs, 2011), that typically involves the use of electronic devices and focuses on online platforms (Digital Marketing Institute, 2018). Hence according to Wymbs (2011) it can be fundamentally described as "The use of digital technologies to create an integrated, targeted and measurable communication which helps to acquire and retain customers while building deeper relationships with them" (p. 94). Due to a change in how media is used, traditional push marketing has lost efficiency and pull strategies, that are tailored to customer needs, have evolved (Mühlenhoff & Hedel, 2014) . There are certain benefits that digital marketing has over traditional marketing, such as the ability to target specific groups with individually tailored messages (Terstiege, 2020) and the usage of technologies that are measureable (Wymbs, 2011). Digital marketing puts a focus on creating relationships between customers and firms where in contrast most traditional marketing is more mass communication oriented (Wymbs, 2011). Common goals of digital marketing efforts are increasing sales, increasing brand awareness, driving traffic to a website, solidifying a brand image and providing value to customers (Digital Marketing Institute, 2018). Digital marketing platforms encompass different sets of tools, which are referred to as assets and can be divided into thee types (Digital Marketing Institute, 2018):

**Owned**
Owned assets are self owned, created and managed and provide marketers with a great level of control. Such assets include blogs, social media profiles, emails, websites and other forms of digital written content.

**Paid**
These assets have to be paid for and can be very helpful to drive potential customers to a website, and expand the reach of owned assets. This type includes banner ads and displays, per-per-click, social media ads and other online campaigns

**Earned**
Earned assets are generated through customer interaction and include, media coverage, product reviews, social media posts shared by others and more.

The Dean of the Southern New Hampshire University identifies 7 main categories of digital marketing: Social Media Marketing, Search Engine Optimization (SEO), Pay-Per-Click (PPC),

Content Marketing, Email Marketing, Mobile Marketing and Digital Marketing Analytics (Bogle, 2020).

### 2.3.2 Important types of Digital Marketing

Digital marketing consists of an array of different digital marketing technologies. The following paragraphs discusses types of digital marketing that have been identified as most important in the field and most relevant for this thesis.

#### 2.3.2.1 Social Media Marketing

In today's world, most people are active on social media and hence it makes sense to exploit this for marketing purposes (Steen & Terstiege, 2020). Social Media describes platforms that enable activities between communities of individuals to communicate with each other and social marketing spans all marketing activity that is carried out over social media channels. Such platforms include Facebook, Instagram and Twitter. From a marketing perspective social media marketing can be considered a form of recommendation marketing where messages are not necessarily communicated by the company itself but spread by the community. It enables companies to build a stronger relationship with their target group and create a stronger bond to their brand. Social media marketing is considered to be an integral part for being able to compete in the future of marketing (Steen & Terstiege, 2020). A good social media marketing strategy needs to be aligned with the company's overall marketing activities and communicate the same messages so that every part of the brand tells the same story. As with all other types of digital marketing, it is possible to thoroughly collect and analyze data, which give digital marketers the tools to demonstrate the effectiveness of a social media campaign. Hence it is clear, that successful social media marketing requires a well thought-through plan and coordination that provides the target group with valuable content (Bogle, 2020).

#### 2.3.2.2 Content Marketing

Content Marketing is nothing new, it has been established since many years, but was not known under that name. A pioneer in the field of providing enriched content to enhance product experience was Oetker, a German producer of baking powder. He printed recipes provided by his wife onto the back of the baking powder packages and consumers used both the product and the recipes. Another example of this practice can be found when looking at the American company "John Deere" and the tire producer "Michelin" which both publish magazines that provide their consumers not with advertisements but with content (Heinrich, 2020). The basis of content marketing is to provide valuable content and this can be applied over various marketing tools, as the impact of such content will likely increase the success of every type of digital marketing. By creating and providing professional content it can be considered as guaranteed that a process will be triggered. Members of a target group are going to find the content, brand awareness will

increase and a relationship between potential customer and the company will be formed (Heinrich, 2020).

#### 2.3.2.3 Email Marketing

Email marketing is one of the most effective methods of digital marketing. As 3.7 billion people use email, it is one of the biggest platforms to utilize while it also has the ROI of digital marketing tools (Digital Marketing Institute, 2018). It is of high value in terms of customer relationship as companies can communicate with customers on a personal level and provide content that is relevant and interesting to the customers. This is also possible based on customer data like past purchases or service consumptions in order recommend similar products that customers are most likely to be interested in (Von Rüden et al., 2020). A basic principle to achieve high opening rates of email marketing is that content needs to be relevant. This follows similar ideas as content marketing (Stehr et al., 2014).

#### 2.3.2.4 Influencer Marketing[3]

**Definition of the term "influencer"**

The term "influencer" can be considered as a relatively new one and has only appeared quite recently with the emergence of social media platforms that are present in everyday life. Due to this, there is no real academic definition available yet and a general lack of research in this field can be observed when investigating the topic. The following paragraph aims to establish a useful definition to understand what defines an influencer.

On a psychological basis, humans are relatively easily influenced and due to everyday life seemingly becoming more complex, people tend to look to others for advice before making decisions. This is also the case when it comes to buying decisions or when reconsidering one's own behavior and ideas, that are constantly changing in humans. People tend to think, that the influencing person is to some extent and expert and well informed when talking about a topic, or a product as well as sympathetic and hence except their advice or opinion when making decisions. Influencer usually are people, that are not personally known to most people that are influenced by them, but encompass the properties of being sympathetic, engage on social networks very frequently and get attention by a large group of people that read or watch their posts (Nirschl & Steinberg, 2018). Another factor that plays an important role for someone to become an influencer is physical attractiveness, similarity and likability, which implies that the more authentic, relatable and better looking someone is on social media, the better the chances to become an influencer. Such a person, enjoys high credibility and trust within their network which enables

[3] Section 2.3.2.4 is based upon (Fila et al., 2020, pp. 4–5)

them to influence other people's behavior, ultimately resulting in the name "influencer" (Schach, 2018). Traditionally before the emergence of social media, a similar concept to influencer was an "opinion leader", which was a person, also considered to have expert knowledge in a field, that other people would go to, in order to get advice (Schach, 2018).

There are different classifications for influencers, where the three main categories are the mega influencer, the macro influencer and the micro influencer, which basically classify the influencer based on its network size. The mega influencer is mostly a celebrity of some sort and has a network size of over 1 million followers, which also implies they have the highest reach, but the least effect when it comes to actual influence and driving actions. Macro-influencers have a network from 10 000 to 1 million followers and a relatively high topical influence in their field, such as business or lifestyle. Lastly, micro-influencers have a network of 500 to 10 000 followers have the highest ratio of influence based on their network size, as they leverage their personal experience and are the most relatable of all categories, but their reach is obviously rather low (Gottbrecht, 2016).

**The effect of an influencer**

As pointed out above and implied by the name itself, an influencer can create change in the behavior of people and the size of this effect depends on size of the network.

This influence can be exerted to reach a multiplicity of goals which can be internal goals of the influencer or external goals that come from a firm or other institution. Considering such internal goals, an influencer usually follows a certain approach representing oneself in a specific way, so such goals will go along with having a matching representation. In this way an influencer can also leverage its own influence to influence organizations in a way desired by the influencer and its network e.g. speak up about unethical productions practices. An influencer can also influence other influencers and in this way have a much bigger effect that spreads through the combined reach of the networks of influencers (Schach & Lommatzsch, 2018).

External goals originating from a company can be to influence the buying behavior of consumers in a desired way, to increase the brand loyalty of consumers, increase the general brand awareness, promote a product or a property of product and others (Schach & Lommatzsch, 2018).

**Developments in the field of influencers**

In the field of traditional advertising, trust has considerably decreased while it has increased when it comes to the field of influencer marketing. Despite this trend being very present, many companies are not even informed about the topic while others are already utilizing it in their marketing efforts. When analyzing the consumer side, a survey of 172 consumers, 40% have already bought a product because of the recommendation of an influencer. This clearly shows that influencers do have a real impact on consumer behavior (Nirschl & Steinberg, 2018).

In another survey, 81% of people considered opinions from blogs before buying something online, again showing that people tend to trust the opinions of influencers when making buying decisions (Nirschl & Steinberg, 2018), implying that this certainly is a relevant field that could foster change in the behavior of people.

Statistically, in Germany 50% of 14–19-year-olds, 33% of 20–29-year-olds, 24% of 30–39-year-olds and 10% of 40-40-year-olds bought something because of an influencer recommendation. This implies that the effect of an influencer is greater in younger age groups (Faktenkontor, 2017).

#### 2.3.2.5 Mobile Marketing

As the name implies, this type of digital marketing aims to reach consumers on smartphones or tablets. Generally it utilizes text, messages, websites, email and mobile applications and emphasizes on smartphones (Bogle, 2020). While also laptops or tablets can be used to access the internet and are considered mobile device, mobile marketing typically revolves mostly around smartphones. With the evolution of the smartphone the options for mobile marketing have continuously expanded and provides a marketer with the ability to gain many insights into the life of a consumer as well as many options to interact with a consumer (Rieber, 2017). There are various forms of mobile marketing instruments such as mobile web, mobile app, mobile advertising, proximity marketing, social media and content marketing as well as messaging and chatbots. As the smartphone is considered to have a high potential for direct interaction with a consumer and almost everybody owns a smartphone, mobile marketing can be used for virtually any target group. Mobile apps have the potential to become part of the everyday life of consumers and can be included in each of the 4-Ps of marketing (Rieber, 2017).

Nowadays, more than 94% of private internet usage takes place on smartphones via apps making this a hugely relevant sector for marketing. Mobile advertising can be used to interact with a consumer along the whole customer journey. A mobile app can provide a base for such mobile ads that directly interact with consumers and show ads in various different forms such as banner, interstitial, rich media, video and native advertisement. (Rieber, 2017).


FIGURE 7 FORMS OF MOBILE ADVERTISEMENTS (Rieber, 2017, p. 71)

It is important to note, that a banner, an interstitial, rich-media and a video differ from native by being directly identifiable as advertisements, while native forms of advertisements blend in

with the content. An example that can be used to illustrate this form of mobile advertising are Facebook ads, which are presented just like regular Facebook posts. This makes these ads less intrusive and more effective than the other types of mobile ads (Rieber, 2017).

## 2.4 Conceptual Framework

This section aims to bring together the theories introduced in this chapter and elaborates on how the theories are utilized to solve the research questions, which are as follows:

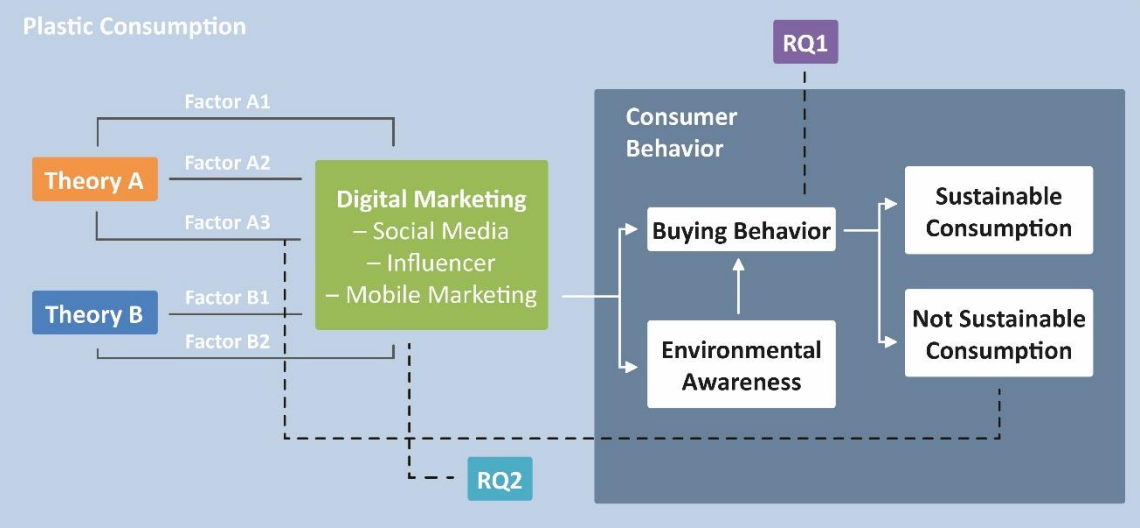


FIGURE 8 CONCEPTUAL FRAMEWORK

Figure 8 illustrates how the theories explained in this chapter are linked in order to answer the research questions of this thesis. First, under the topic of plastic consumption, a digital marketing message is designed to utilize information from theories stemming from consumer behavior research. This message is then expected to influence the behavior of a consumer, resulting in an impact on environmental awareness, the buying behavior or both. When looking at buying behavior, the message will prove effective if a consumer decides to reduce the amount of plastic packaging bought (sustainable consumption) and not effective if otherwise (not sustainable consumption). The impact on environmental awareness is considered to be relevant as well, as with greater environmental awareness, a consumer is logically more likely to make more sustainable consumption decisions. It is important to note that such a message could also have no impact at all.

The Theory of Planned Behavior by Ajzen (1991), Theory A in Figure 8, can be applied to analyze modes of behavior and implies that knowledge in terms of sustainability will play a role when making buying decisions, as this will most likely influence if people feel positive or negative towards plastic packaging and hence form the personal attitude. The knowledge factor then also feeds into the element of social norm, as with more knowledge people are more likely to feel a responsibility in terms of sustainability for society. While the factor of social norm in regard to peer pressure will not be present when consuming a digital marketing message, the acquired

knowledge that society is affected by a specific individual decision, can be assumed to still impact consumer behavior. Control could be a limiting factor for people to decide for more sustainability when it comes to plastic packaging, as those products might have the tendency to be more costly and hence people might feel limited despite wanting to behave in a certain direction based on the other two elements. Based upon the factor that, control is only a reliable predictor under the assumption that a person has enough knowledge concerning a specific behavior, it is reasonable to say, that by increasing people's knowledge in the field of plastic, the direct influence of control on behavior might get more significant. Within the conceptual framework these factors are describe as Factor A1, which represents the personal attitude, Factor A2 representing social norm and Factor A3 representing control.

Based on the concepts identified in the research of Antonetti & Maklan (2014), represented as Theory B in Figure 8, it can be argued that by social pressure, negative emotions could be experienced after making a not sustainable purchasing decision and vice versa. The research specifically identifies guilt as the negative emotion and pride as the positive emotion, which will hence be used further on in this framework. In the case of this research, such a decision could mean buying a product packaged in plastic packaging. Through an experiment it could be tested whether, showing a campaign that puts plastic packaging in a perspective that lets consumers experience guilt, their behavior can be altered towards a more sustainable behavior. This shift to more sustainability would lead to not experiencing guilt in terms of product packaging anymore and help consumers reduce cognitive dissonance[4]. The same effect can be expected when considering the feeling of pride. After consumers gain more knowledge in the area of sustainability and the harmful effects of plastic, it is likely that, when a consumer decides to reduce consumption in terms of plastic packaging, pride will be experienced and self-endorse the behavior. Looking at the effects of guilt and pride observed by Antonetti & Maklan (2014), it is also reasonable to say that the experience of guilt will lead consumers to reduce this feeling through behaving differently and later on the experience of pride will help to solidify this behavioral change. The conceptual framework in Figure 8 represents guilt as Factor B1 and pride as Factor B2.

Through the systematic review carried out by Cotte and Truedl in 2009 several factors for designing a survey in the field of sustainable consumption have been identified. First, a survey needs to be well designed and questions need to be formulated to actually measure the desired phenomena. In respect of the other research and theory on behavior, intention and attitudes, it

[4] According to Atingdui (2011) Cognitive Dissonance is defined as "Cognitive dissonance is an experience in which individual's encounter psychological discomfort when they simultaneously have thoughts that are in conflict with each other. Cognitive dissonance often serves as a motivational force as it often drives them to seek to reduce discomfort." (pp. 380–381).

seems important to enrich a survey with information that educates in terms of sustainability and makes use of the fact that emotions do play a role when consumers make sustainable purchasing decisions. The research further indicates that, if a survey directly communicates that the focus lies within the field of sustainability, this information is likely to impact the results. For this thesis, this information was utilized to put together a survey that focuses on collecting unbiased information by not directly using sustainability in the theme of the survey, but rather on a question-to-question basis. The main theme will focus on digital marketing and consumer behavior when it comes to the survey, but questions will be designed to derive information on sustainable consumption in terms of plastic.

The digital marketing message will consist of enriched content based upon the method of content marketing and come in the form of social media marketing (Instagram and Facebook), influencer marketing and mobile marketing as native advertisements. It is assumed that, if such a message proves effective, also email marketing and other forms of digital marketing can likely be leveraged as effective tools to induce behavioral change in consumers. Such a message will be based upon the research concerning the emotions of guilt and pride by Antonetti & Maklan (2014) and the theory of planned behavior by Ajzen (2005).

Firstly, this message should in theory have an impact on the environmental awareness of a consumer and secondly play a role when a consumer makes a buying decision in terms of plastic packaging. Such a decision can ultimately be sustainable, when the product does not have any plastic packaging, or not sustainable when a product has plastic packaging. A factor that might directly influence the behavior is the factor of perceived behavioral control, Factor A3, identified in the Theory of Planned Behavior (Ajzen, 1991). This can be attributed to the fact, that despite an increase in terms of environmental awareness, due to the lack of control (e.g. monetary resources) a consumer could still behave differently to what is expected based on awareness.

Ultimately RQ 1 can be answered by observing the results in terms of sustainable consumption and RQ 2 can be answered based upon the size of the behavioral impact from a specific digital marketing message. The research questions are presented in the introduction of the thesis, but for organizational purposes are repeated as follows:

- RQ 1: Can digital marketing induce behavioral change in consumers towards a reduction of plastic waste?
- RQ 2: Which form of digital marketing has the highest impact on consumer behavior in terms of plastic packaging?

The hypotheses, that have been identified as relevant in order to answer the research questions, are explained in detail in the next section, 2.4.1.

### 2.4.1 Hypothesis Development

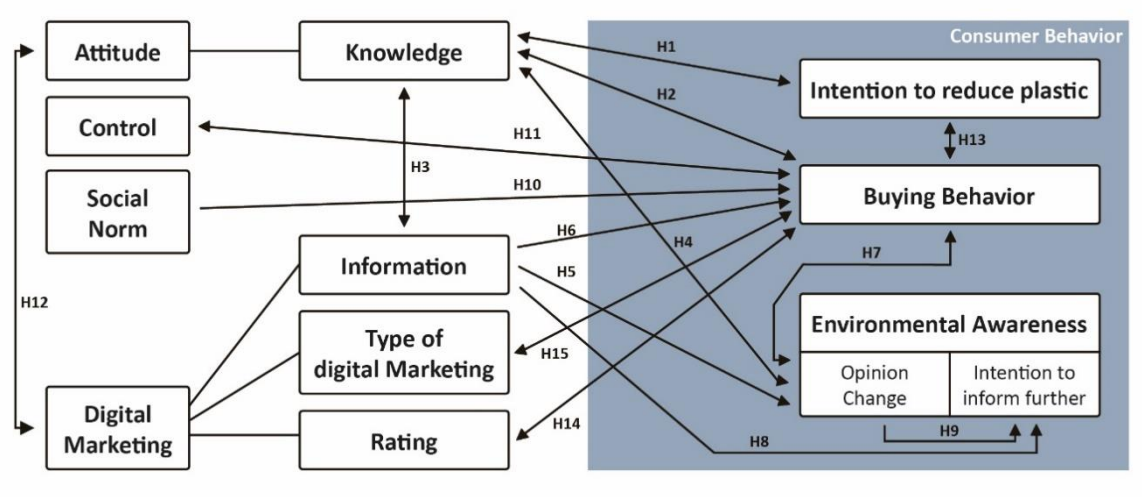


FIGURE 9 CONCEPTUAL FRAMEWORK FOR HYPOTHESES

Figure 9 visualizes the components of the main hypotheses that are relevant for answering RQ1 and RQ2. These components are derived from the literature and questions in the survey are designed to retrieve information from the respondents to test the developed hypotheses, which are presented in the following paragraph. First the hypotheses are presented, then the relevant independent and dependent variables are identified and related to the questions of the survey which can be found in Appendix 1 and Appendix 2 accordingly.

#### 2.4.1.1 Hypotheses aimed at providing information on RQ1:

- **H1: There is a relationship between previous knowledge about sustainability and the intention to reduce plastic packaging.**
  - *Independent variable: Previous knowledge (Q19.1-Q19.4)*
  - *Dependent variable: Intention to reduce plastic packaging (Q19.6)*
- **H2: There is a relationship between previous knowledge about sustainability and willingness to reduce plastic packaging because of a digital marketing message.**
  - *Independent variable: Previous knowledge (Q19.1-Q19.4)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **H3: There is a relationship between previous knowledge about sustainability and information received from a digital marketing message.**
  - *Independent variable: Previous knowledge (Q19.1-Q19.4)*
  - *Dependent variable: Information received (Q7.1,9.1,11.1,13.1)*
- **H4: There is a relationship between previous knowledge about sustainability and opinion change from a digital marketing message.**
  - *Independent variable: Previous knowledge (Q19.1-Q19.4)*
  - *Dependent variable: Opinion change (Q7.2,9.2,11.2,13.2)*

- **H5: There is an impact of information received on the opinion on plastic packaging**
  - *Independent variable: Information received (Q7.1,9.1,11.1,13.1)*
  - *Dependent variable: Opinion change (Q7.2,9.2,11.2,13.2)*
- **H6: There is an impact of the information a consumer receives on the willingness to reduce plastic packaging consumption**
  - *Independent variable: Information received (Q7.1,9.1,11.1,13.1)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **H7: There is a relationship between opinion change and willingness to reduce plastic packaging**
  - *Independent variable: Opinion change (Q7.2,9.2,11.2,13.2)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **H8: There is an impact of information received on consumers wanting to know more about the problems of plastic packaging**
  - *Independent variable: Information received (Q7.1,9.1,11.1,13.1)*
  - *Dependent variable: Want more information (Q7.4,9.4,11.4,13.4)*
- **H9: There is an impact of changed opinion on consumers wanting to know more about the problems of plastic packaging**
  - *Independent variable: Opinion change (Q7.2,9.2,11.2,13.2)*
  - *Dependent variable: Want more information (Q7.4,9.4,11.4,13.4)*
- **H10: There is an impact of social norm on the willingness to reduce plastic packaging**
  - *Independent variable: Social norm (Q19.3)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **H11: There is a relationship between willingness to pay more and willingness to reduce plastic packaging**
  - *Independent variable: Willing to pay more (Q19.5)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **H12: There is a difference in trust between people who already bought products because of digital marketing and those who did not**
  - *Independent variable: Bought product because of digital marketing before (Q15)*
  - *Dependent variable: Rating on trust in digital marketing (Q14)*
- **H13: There is a relationship between consumers trying to reduce plastic packaging and the amount that is typically in their basket**
  - *Independent variable: Intention to reduce plastic (Q19.6)*
  - *Dependent variable: Amount typically packaged in plastic (Q18)*

#### 2.4.1.2 Hypotheses aimed at providing information on RQ2

- **H14: There is a relationship between rating of a post and the willingness to reduce plastic packaging**
  - *Independent variable: Rating of post (Q6,8,10,12)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **H15: There is a difference in willingness to reduce plastic between types of digital marketing.**
  - *Independent variable: Type of digital marketing*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*

#### 2.4.1.3 Demographic Hypotheses:

The following hypotheses are derived from the demographic variables that are gathered through the survey and assume there are differences in consumer behavior that can be attributed to these demographic factors. As these hypotheses are not based upon literature, these hypotheses are not part of Figure 9.

- **HD1: There is a difference in willingness to reduce plastic between age groups**
  - *Independent variable: Age group (Q2)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **HD2: There is a difference in willingness to reduce plastic based on place of residence**
  - *Independent variable: Place of residence (Q5)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **HD3: There is a difference in willingness to reduce plastic between income groups**
  - *Independent variable: Income groups (Q4)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **HD4: There is a difference in willingness to reduce plastic between genders**
  - *Independent variable: Gender (Q1)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **HD5: There is a difference in willingness to reduce plastic between levels of education**
  - *Independent variable: Level of education (Q3)*
  - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*

- **HD6: There is a difference in willingness to reduce plastic based upon usual type of store for grocery shopping**
    - *Independent variable: Typical type of store for grocery shopping (Q17)*
    - *Dependent variable: Willingness to reduce plastic packaging (Q7.3,9.3,11.3,13.3)*
- **HD7: There is a difference in opinion change between age groups**
    - *Independent variable: Age group (Q2)*
    - *Dependent variable: Opinion change (Q7.2,9.2,11.2,13.2)*
- **HD8: There is a difference in opinion change between levels of education.**
    - *Independent variable: Level of education (Q3)*
    - *Dependent variable: Opinion change (Q7.2,9.2,11.2,13.2)*

# 3 METHODOLOGY

## 3.1 Introduction

In this chapter, the methodology of this research is described by first explaining the research process, then the worldview of this research and then the chosen research approach derived from this worldview. Afterwards the research instrument, used to collect data, and the sampling method are explained.

## 3.2 Research Design

This research follows a linear process as can be seen in Figure 10. First, relevant literature is reviewed and the concepts and theories are identified. Then these concepts and theories are brought together in a conceptual framework in order to explain how the phenomenon of digital marketing is understood as one particular cause to affect consumer behavior in general. The theories dealing with consumer behavior are then utilized in order to test their influence and effect on environmental awareness and buying behavior in the context of plastic packaging (see Figure 9). To measure the effect on both environmental awareness and buying behavior a quantitative research approach is applied. The method of an online survey is used for collecting data which is then statistically analyzed to support or refute the underlying hypotheses for each research question. Ultimately the results are discussed in light of the utilized theories and a conclusion is drawn from these results.

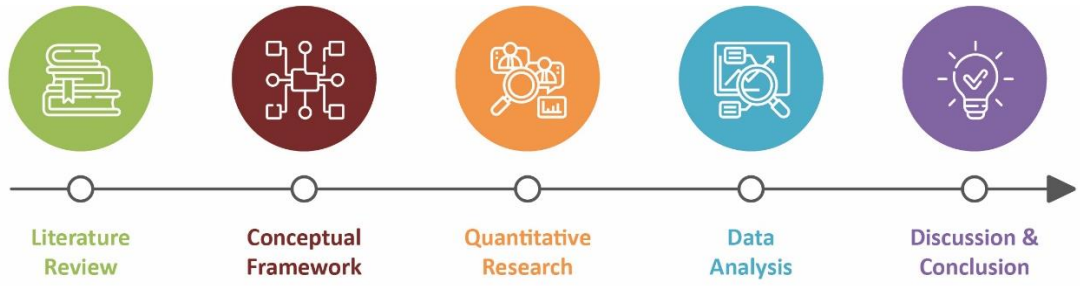


FIGURE 10 RESEARCH PROCESS

## 3.3 Research approach

Following a postpositivist worldview (Creswell & Creswell, 2018) the cause that influences an outcome is studied in this thesis. This is done through development of research questions and hypotheses based upon existing theories, that are tested through numeric measures aiming to quantify the behavior of individuals (Creswell & Creswell, 2018). As a result of the application of the positivist worldview, a quantitative research approach, to test whether there is a relationship among the variables identified in relevant theories, is applied. With the aim of solving a real-world problem, namely plastic pollution through application of digital marketing to influence consumer behavior, a quantitative approach is taken.

The chosen research instrument is an online survey consisting of purely close ended questions, as this type of questions support the quantitative data collection process best (Creswell & Creswell, 2018).

## 3.4 Online survey

An online survey provides an ideal setting for collecting data in order to answer the question on whether digital marketing can induce behavioral change in consumers towards reducing plastic waste. It provides the ability to relatively easily include the types of digital marketing, that are of interest to this research, as questions and it can also be distributed to the sample by leveraging said types of digital marketing. Another benefit of an online survey is, that it is also easy to administer and provides a convenient way to collect the data for later analysis in digital form. The survey data was collected in a longitudinal fashion in a period of three weeks from April 22nd, 2021 until May 13th, 2021.

The survey used in this research consists of multiple sections, namely: demographic information, digital marketing focused on Instagram, digital marketing focused on Facebook, digital marketing focused on Influencers, digital marketing focused on mobile marketing and lastly final questions about behavioral factors as well as knowledge about sustainability (see Appendix 1 and Appendix 2). As respondents were expected to mainly consist of German and English language speakers, the survey was set up as multilingual where respondents were given the opportunity to choose a preferred language at the start of the survey. A total of 19 closed questions are contained in the survey. Five of these questions are Likert scale questions where respondents were asked to indicate a level of agreement to multiple statements. First demographic information in the form of gender, age, education, income and area of residence was collected. Then sets of questions referring to digital marketing types were asked. Each of these questions utilizes a different type of digital marketing and the message provides information on the topic of plastic pollution and is aimed to, based on the research of Antonetti & Maklan (2014), invoke emotions in respondents. These questions are presented in detail in the sub-sections 3.4.1-3.4.4.

### 3.4.1 Social Media Marketing – Instagram

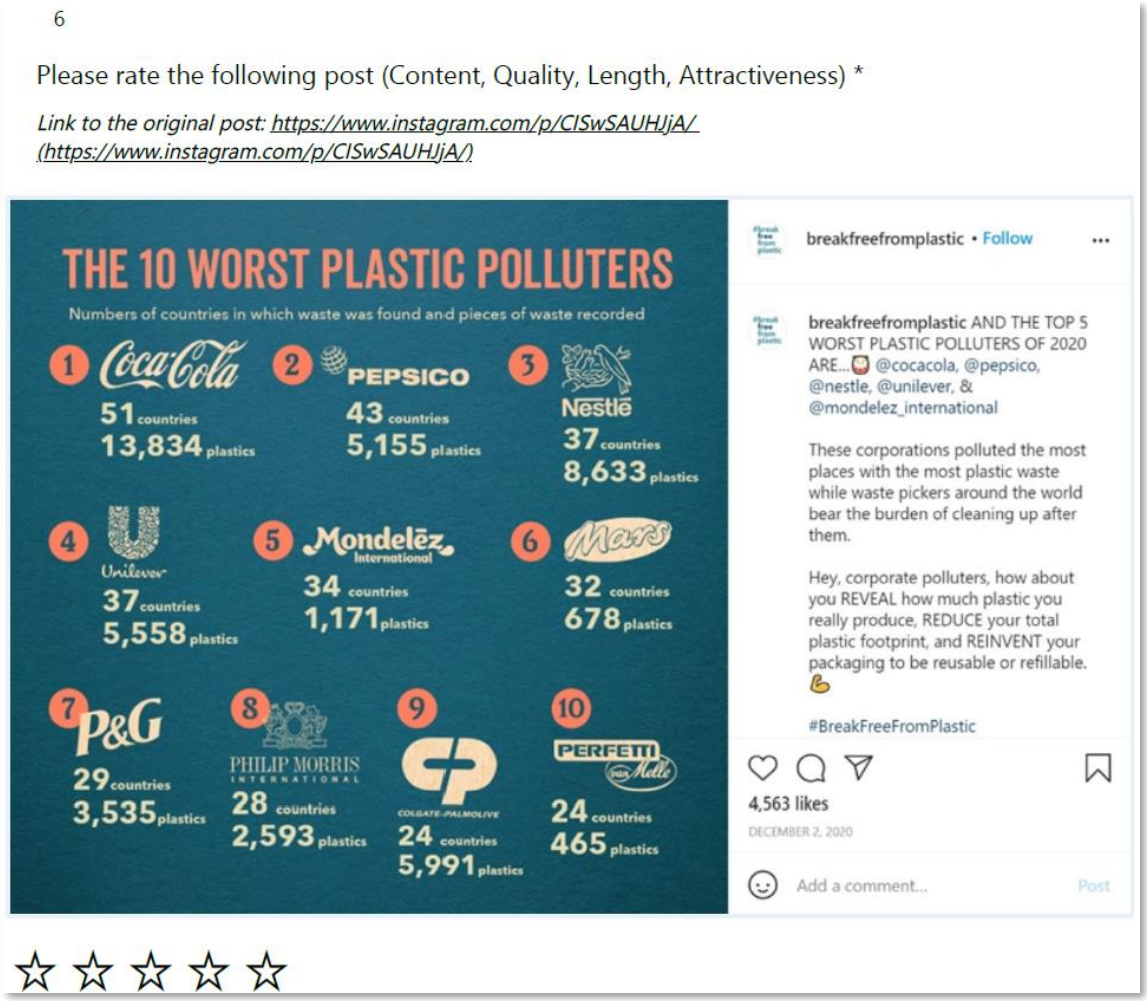


FIGURE 11 SURVEY QUESTION INSTAGRAM (Break Free From Plastics, 2020a)

For the first question regarding digital marketing an Instagram post by Break Free From Plastics (2020a) was chosen to be presented to respondents. For the German version of the survey, the text of the post was translated for better understanding (Appendix 1). This post utilizes information to educate consumers and presents well known companies as environmental plastic polluters in a ranking. As well-known companies are used in this post, it can be assumed to induce a certain level of emotion within people. Respondents were also given the opportunity to look at the original post, by providing a link.

### 3.4.2 Social Media Marketing - Facebook

8

Please rate the following posting (Content/Information, Quality, Length, Attractiveness) *

*"It is absurd: By cleaning our houses/aprtments with ordinary household cleaning products we still leave dirt. Despite this dirt is not visible in our own property, it is very visibile on our planet. With every additional empty cleaning product packaging we pollute the world with more not really recyclable plastic.*

*Did you know, that in German 1.9 Million single-use plastic bottles are used? Per day this amounts to 45 Million pieces. This means, that on average every German citizen uses 200 single-use plastic bottle! We can reduce these numbers! We reuse our coffe-2-go cup time and time again, we refill our soap dispenser and there is even solid shower soap available. Why not household cleaning products?! We say, household cleaning products should not pollute our environment!* ✕

*For this reason we developed cleaning tabs, that only contain the minimum needed amount of ingredients and are easily biodegradable without compromising on cleaning power. Our cleaning product bottles are made from 100% recycled PET (with the only exception of the spray nozzle) and we made sure they can be reused for a very long time.* ♡ *Many commonly used household cleaning products even contain substances that cannot be filtered out by sewage treatment plants.* 🌊 *So in terms of environment, your own health and also your wallet, it pays off to use sustainable cleaning products.* 😷 *Lets make the world a cleaner place together* 🚰🌍*"*

*Translation of the picture: "Should cleaning products pollute the planet?"*

*Link to the original post: https://www.facebook.com/everdrop.de/photos/a.140482190737244/340181357433992/ (https://www.facebook.com/everdrop.de/photos/a.140482190737244/340181357433992/)*


☆ ☆ ☆ ☆ ☆

FIGURE 12 SURVEY QUESTION FACEBOOK (Everdrop, 2020)

The second question utilizes a Facebook post by Everdrop (2020) that transports information on plastic packaging in Germany and elaborates on how their products can help combat the plastic waste problem. For the English version of the survey this post was translated from German to

English (Appendix 2 contains the original post, Appendix 1 the translated version). This question is assumed to not invoke high level of emotion. A link to the original post was provided for respondents.

### 3.4.3 Influencer Marketing

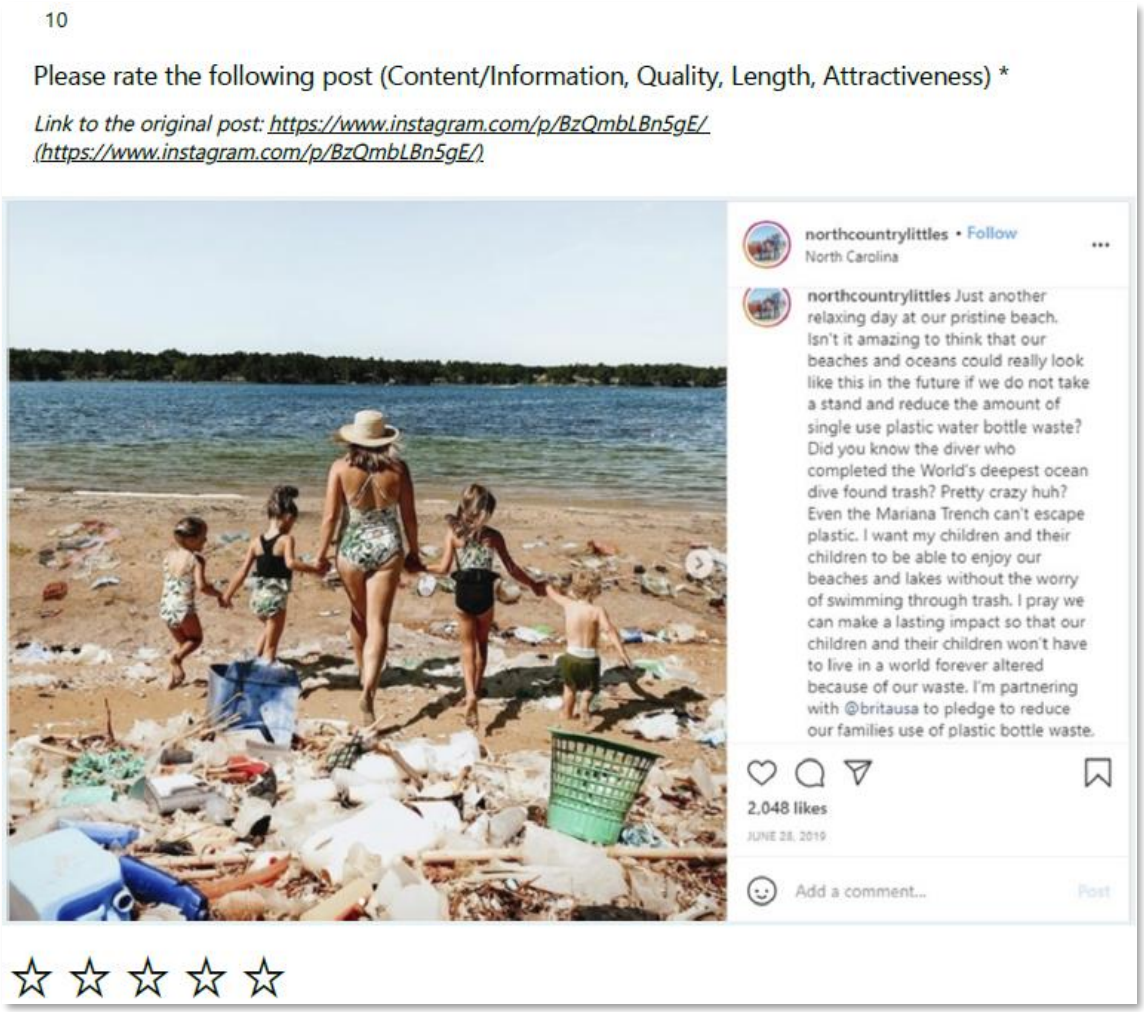


FIGURE 13 SURVEY QUESTIONS INFLUENCER (NORTHCOUNTRYLITTLES, 2019)

For the topic of influencer marketing an influencer who promotes sustainability and reduction of plastic waste was chosen. The post by northcountrylittles (2019) elaborates on the aspects of plastic waste polluting beaches and how it is important to preserve nature for future generations by reducing the plastic waste that is generated. When looking at the picture that is used in the post, it leverages the elements of a family with children on a polluted beach. This is assumed to invoke a rather high level of emotions in people. Here again, respondents were provided with a link to the original post.

### 3.4.4 Mobile Marketing – Native Advertisement In-App


FIGURE 14 SURVEY QUESTION MOBILE MARKETING NATIVE ADVERTISEMENT (LEFT PICTURE: © IMAGE'IN - STOCK.ADOBE.COM (IMAGE'IN, N.D.), RIGHT PICTURE: © ALEKSEJ - STOCK.ADOBE.COM (ALEKSEJ, N.D.))

The last digital marketing question uses a fictional in-app advertisement that would theoretically show up when ordering food delivery within an app. It would present the consumer with the choice to order the food without any plastic packaging so that no plastic waste would be generated by the order. Through using two different pictures that aim to induce emotions, as identified the research of Antonetti & Maklan (2014) and by using text that aims at leveraging the factor of subjective norm identified in the Theory of planned behavior by Ajzen (1991), this advertisement is tailored to invoke emotions in respondents. As these two advertisements were self-made by the researcher, no link to a source can be provided.

### 3.4.5 Population and sampling technique

The target population of interest includes everyone who goes shopping aged 18 and above, that uses social media or mobile applications and goes grocery shopping. As was identified in the literature review, the biggest sector that generates plastic waste, is the packaging sector with many single-use plastic applications in food packaging. This target population is hard to access and hence a reasonable accessible sampling frame for this research is considered the available social media connections as well as email contacts from the researchers private and work email lists. The sampling technique used to draw a sample from this frame was the non-probability sampling technique, convenience sampling in combination with snowball sampling (Malhotra et al., 2017). Convenience sampling is defined as an attempt to obtain a sample of convenient elements with the selection primarily left to the researcher, where often elements are the right place at the right time. This does hold true for the usage of social media networks and email contacts (Malhotra et al., 2017). Snowball sampling than simply asking participants to spread the survey to others that are asked to also participate and hence increasing the response rate (Malhotra et al., 2017). To increase response rates, social network contacts of the researcher were asked to take part in the survey three times with a space of one week in between over the data collection period.

The size of the sample for convenience sampling based on the initial determination amounted to 418 LinkedIn connections, 678 Facebook connections, 659 Instagram connections, 37 private email contacts and 22 work email contacts, with a likely overlap of 50% between LinkedIn, Facebook and Instagram. This resulted in a sample size of 937. The number of respondents, that was generated by snowballing cannot be estimated. According to Malhotra et al. (2017), a typical range for a sample size in a marketing study is 300-500 with a minimum of 200. This indicates that the sample size did meet these criteria. The survey was completed by 361 respondents which indicates a response rate of 38.52% (937 sample units / 361 respondents).

## 3.5 Data analysis

Data collection through an online survey resulted in data that could be simply imported into SPSS for statistically testing the hypotheses. As a first step, descriptive analysis was applied to better understand the composition of the data. In the second step, data was analyzed in a two-tailed fashion for testing the hypotheses as the direction of correlation was unknown for all variables. Correlations were analyzed using a Pearson test, based upon a non-normal distribution of data. A Mann-Whitney-U test was used to compare differences in trust in digital marketing based upon previous experiences. To identify pairwise differences between types of digital marketing a Friedman test was applied, and then differences were further analyzed by using a Wilcoxon signed-rank test. Group differences for the demographic hypotheses were tested through application of a Kruskal-Wallis test.

# 4 RESULTS

In this chapter the results gathered from the online survey are reported. The data from respondents is first presented in detail through descriptive statistics, to provide a better understanding of data distribution, and then the hypotheses are tested through correlations as well as tests for group differences based on the presented data.

## 4.1 Descriptive Statistics

As mentioned in section 3.4.5, an overall of 361 responses was collected during the time of data collection. Based upon the sample size, this results in a response rate of 38.52%.

### 4.1.1 Demographics

In the online survey, questions 1 to 5 cover demographics and social status questions, which are presented graphically as well as through deeper textual analysis within this section.

#### 4.1.1.1 Age

The age distribution of respondents ranges from 18 to over 65, visualized in Figure 15, where 6 distinct groups were provided as options for respondents. Within these groups the results were ultimately distributed as follows: 23% of respondents are between 18 and 24 years old - 39% are between 25 and 34 years old - 11% are between 35 and 44 years old - 13% are between 45 and 54 years - 9% belong to the group of 55-64 years and the fewest number of respondents belongs to the age group of 65 and above. What is notable about the distribution is that more than half, 62% percent of respondents are younger than 35.

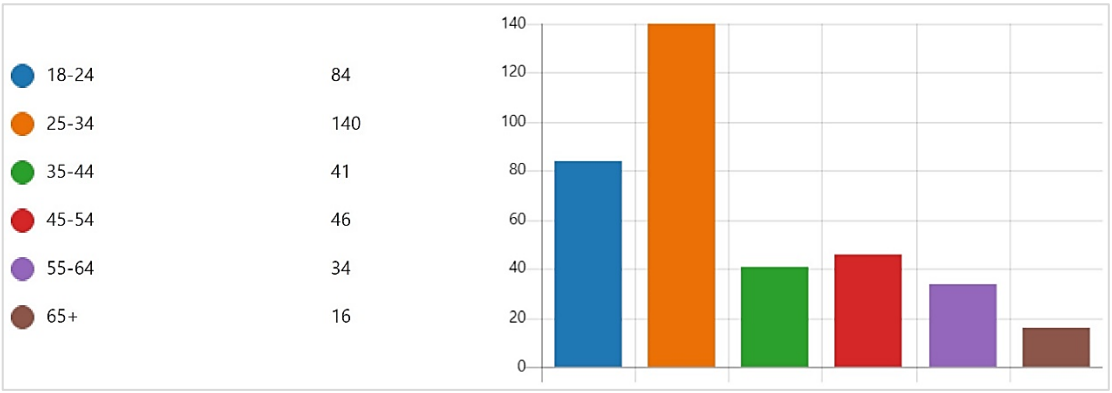


FIGURE 15 AGE DISTRIBUTION OF RESPONDENTS IN ABSOLUTE NUMBERS

#### 4.1.1.2 Gender

Looking at the gender distribution in Figure 16, it can be seen that it is rather balanced between male and female respondents, only 1 non-binary and 2 no answer responses have been provided. This results in a distribution of 48,8% male respondents, 50,4% female respondents and 0,9% non-binary + other responses.


FIGURE 16 GENDER DISTRIBUTION OF RESPONDENTS IN ABSOLUTE NUMBERS

#### 4.1.1.3 Level of Education

For the level of education 6 options were provided to survey respondents, visualized in Figure 17. Here 4,17% have responded with “Compulsory school”, 14,68% with “Apprenticeship”, 35,73% with “Highschool diploma”, 22,44% with “University (Bachelor)”, 19,11% with “University (Master)” and 3,32% with “University (Dr., PhD). Thus, it can be seen that most of the respondents have indicated “Highschool” as highest level of education and the second most have indicated “University (Bachelor)”. When combining University as a single level of education, this results in 44,87% of respondents having attained a University degree as their highest level of education.

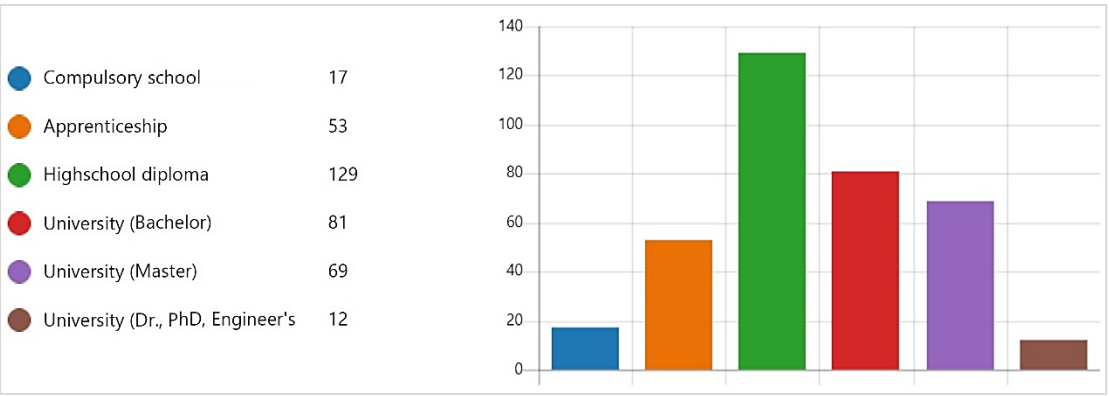


FIGURE 17 HIGHEST LEVEL OF EDUCATION OF RESPONDENTS IN ABSOLUTE NUMBERS

#### 4.1.1.4 Level of Net Income

The level of net income was divided into seven response groups, as can be seen in Figure 18. Most responses lie within the lower three groups, where 26,32% responded with “<15.000€”, 31,3% responded with “15.001€-30.000€” and 22,16% responded with “30.001€-45.000€”, which in total amounts to 79,78%. For the other response groups, 9,42% responded with

“45.001€-60.000€”, 3,32% responded with “60.001€-75.001€”, 3,32% responded with “75.001-90.000€” and 4,16% responded with “>90.001€”. This results in a total of 20,22% for response groups with a net income over 45 000€.

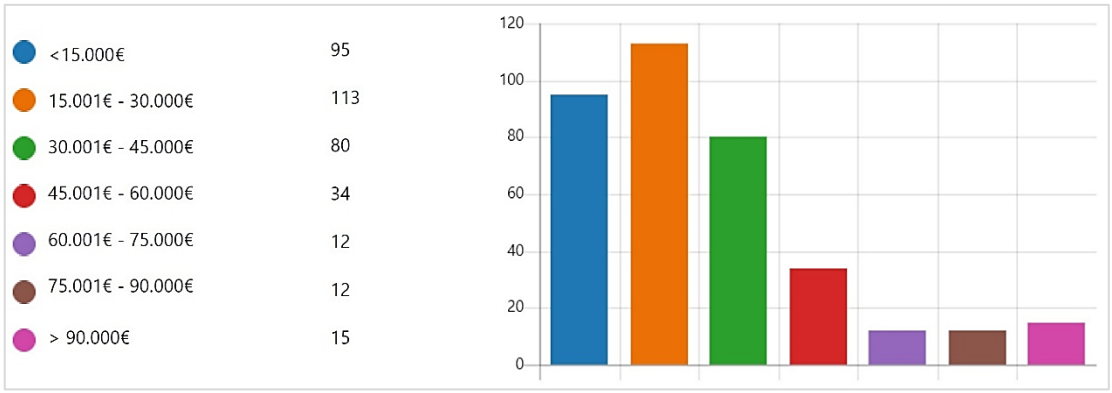


FIGURE 18 LEVEL OF NET INCOME OF RESPONDENTS IN ABSOLUTE NUMBERS

#### 4.1.1.5 Place of Residence

Figure 19 visualizes the distribution of respondent’s place or residence. 31% come from a “Rural area or village”, 15% from a “Small city”. Together this makes up 46% of respondents. 16% come from a “City” and 39% come from a “Big City”, which together amounts to 54%. This implies that there is a rather even distribution between respondents from less densely populated and more densely populated areas.


FIGURE 19 PLACE OF RESIDENCE OF RESPONDENTS IN ABSOLUTE NUMBERS

### 4.1.2 Overview of responses on questions

In this section an overview of response data to each question is provided. The corresponding questions can be found in English in Appendix 1 and in German in Appendix 2.

#### 4.1.2.1 Question 6/8/10/12 –Post Ratings Summary

| ★★★½☆ | ★★★★½ | ★★★★☆ | ★★★★☆ |
|---|---|---|---|
| 3.55 Average Rating | 3.64 Average Rating | 3.79 Average Rating | 4.08 Average Rating |
| Instagram | Facebook | Influencer | In-App Ad |

TABLE 2 DIGITAL MARKETING MESSAGE RATINGS PER TYPE

In Table 2, the ratings per type of digital marketing post contained in the survey are indicated. The Instagram post resulted in the lowest average rating of 3.55, while the in-app advertisement

achieved the highest average rating with 4.08. The Facebook and Influencer posts achieved similar ratings, with 3.64 and 3.79 respectively.

#### 4.1.2.2 Likert Scales of Types of Digital Marketing Posts

The following sections provide insights on the responses on the Likert scale for each type of digital marketing that has been used within the survey. First a table with the aggregated data for each type of digital marketing is presented and then a diagram for easier understanding of the distribution of the data is provided.

##### 4.1.2.2.1 Question 7 – Instagram Post Likert Scale

| | 1 - strongly disagree | | 2 - disagree | | 3 - neutral | | 4 - agree | | 5 - strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| ***Q7.1*** | 12 | 3,3% | 54 | 15,0% | 49 | 13,6% | 172 | 47,6% | 74 | 20,5% |
| ***Q7.2*** | 54 | 15,0% | 76 | 21,1% | 107 | 29,6% | 92 | 25,5% | 32 | 8,9% |
| ***Q7.3*** | 33 | 9,1% | 67 | 18,6% | 110 | 30,5% | 98 | 27,1% | 53 | 14,7% |
| ***Q7.4*** | 36 | 10,0% | 48 | 13,3% | 109 | 30,2% | 131 | 36,3% | 37 | 10,2% |

TABLE 3 AGGREGATED DATA INSTAGRAM POST

The Instagram post resulted in almost 70% of respondents indicating that they learned something new. 65,7% indicated that their opinion about plastic did not change, because of the post and 58,2% indicated that there is no willingness to reduce the amount of plastic packaging. Almost half of all respondents, 46,5% indicated that they want to inform themselves further about the topic.

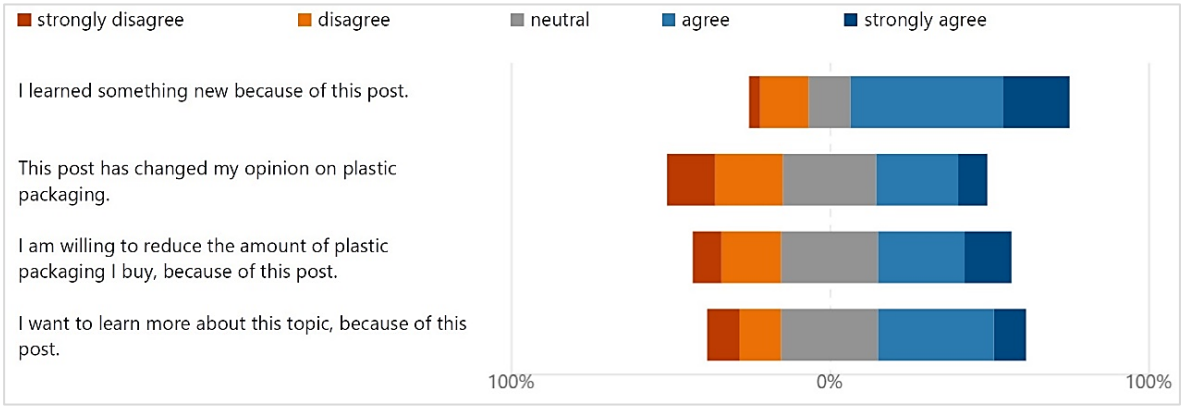


FIGURE 20 INSTAGRAM LIKERT SCALE RESPONSES

#### 4.1.2.2.2 Question 9 – Facebook Post Likert Scale

| | 1 - strongly disagree | | 2 - disagree | | 3 - neutral | | 4 - agree | | 5 - strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| ***Q9.1*** | 22 | 6,1% | 62 | 17,2% | 58 | 16,1% | 159 | 44,0% | 60 | 16,6% |
| ***Q9.2*** | 25 | 6,9% | 71 | 19,7% | 93 | 25,8% | 134 | 37,1% | 38 | 10,5% |
| ***Q9.3*** | 23 | 6,4% | 45 | 12,5% | 77 | 21,3% | 166 | 46,0% | 50 | 13,9% |
| ***Q9.4*** | 35 | 9,7% | 49 | 13,6% | 99 | 27,4% | 128 | 35,5% | 50 | 13,9% |

TABLE 4 AGGREGATED DATA FACEBOOK POST

In question 9, the Facebook post had similar effects on respondents, despite some differences. Fewer respondents indicated that they learned something, but with 60,6% still more than half of the respondents indicated a learning effect. Here 47,6% of responses state that there was an impact on their opinion because of the post and 59,9% agree that they are willing to reduce plastic. 49,4% indicate a willingness to inform themselves further about the topic.

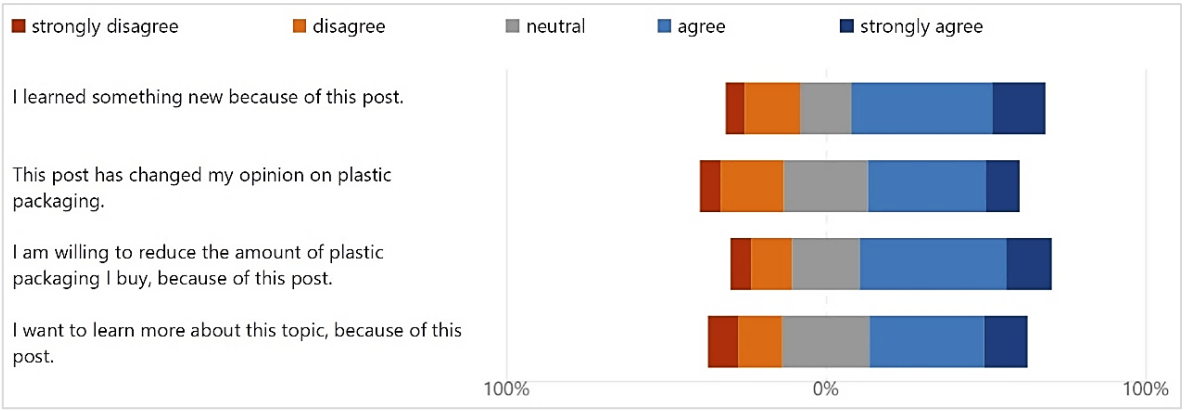


FIGURE 21 FACEBOOK LIKERT SCALE RESPONSES

#### 4.1.2.2.3 Question 11 – Influencer Post Likert Scale

| | 1 - strongly disagree | | 2 - disagree | | 3 - neutral | | 4 - agree | | 5 - strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| ***Q11.1*** | 60 | 16,6% | 92 | 25,5% | 84 | 23,3% | 78 | 21,6% | 47 | 13,0% |
| ***Q11.2*** | 40 | 11,1% | 62 | 17,2% | 73 | 20,2% | 135 | 37,4% | 51 | 14,1% |
| ***Q11.3*** | 27 | 7,5% | 34 | 9,4% | 68 | 18,8% | 160 | 44,3% | 72 | 19,9% |
| ***Q11.4*** | 41 | 11,4% | 50 | 13,9% | 108 | 29,9% | 115 | 31,9% | 47 | 13,0% |

TABLE 5 AGGREGATED DATA INFLUENCER POST

The distribution for the influencer marketing post looks different to the Instagram and Facebook posts, as can be seen in Figure 22. Little information was received, with just 34,6% stating that the learned something. 51,5% indicated that their opinion changed and 64,2% stated that they are willing to change their behaviour. 44,9% of respondents want to learn more about the topic of plastic pollution.

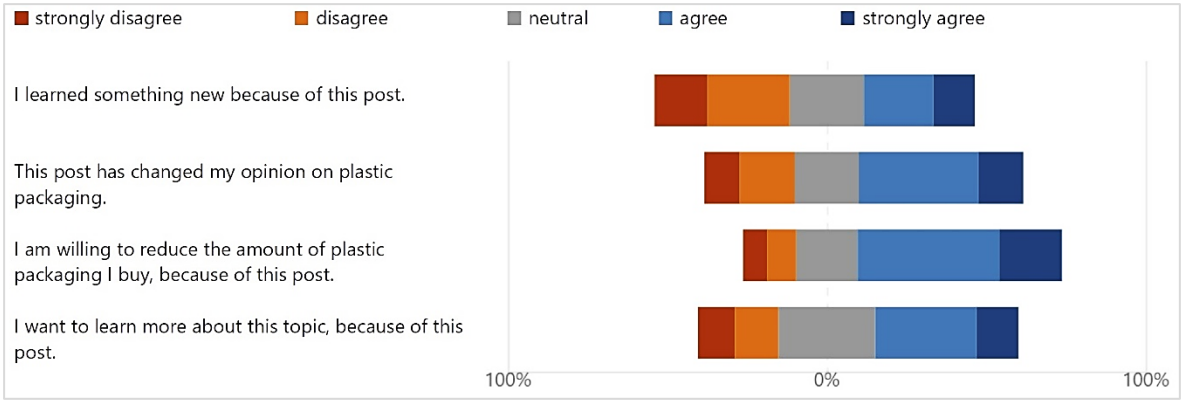


FIGURE 22 INFLUENCER LIKERT SCALE RESPONSES

#### 4.1.2.2.4 Question 13 – In-App Advertisement Likert Scale

| | 1 - strongly disagree | | 2 - disagree | | 3 - neutral | | 4 - agree | | 5 - strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| ***Q13.1*** | 72 | 19,9% | 59 | 16,3% | 90 | 24,9% | 100 | 27,7% | 40 | 11,1% |
| ***Q13.2*** | 40 | 11,1% | 62 | 17,2% | 93 | 25,8% | 120 | 33,2% | 46 | 12,7% |
| ***Q13.3*** | 20 | 5,5% | 30 | 8,3% | 60 | 16,6% | 148 | 41,0% | 103 | 28,5% |
| ***Q13.4*** | 38 | 10,5% | 54 | 15,0% | 111 | 30,7% | 110 | 30,5% | 48 | 13,3% |

TABLE 6 AGGREGATED DATA IN-APP ADVERTISEMENT

The last type of digital marketing that was used in the survey, in-app advertising depicts the highest impact on willingness with 69,5% of respondents agreeing to reduce plastic packaging. Over 61% indicate that there was no learning effect and 45,9% of respondents state that their opinion changed. 43,8% state that they are interested to learn more about the topic.

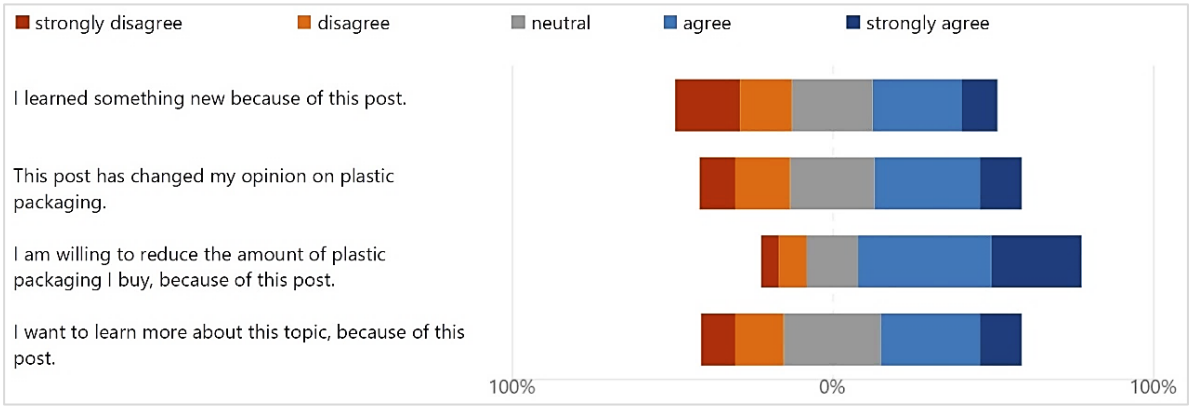


FIGURE 23 IN-APP AD LIKERT SCALE RESPONSES

#### 4.1.2.3 Question 14 – Trust in Digital Marketing

For question 14, the average trust in digital marketing amounted to 3.17 on the given scale of 1 to 5, with 1 being the highest and 5 the lowest.

#### 4.1.2.4 Question 15 – Bought something because of Digital Marketing before

More than ¾, or 78%, of all respondents indicated that, they have bought or adapted their behavior because of digital marketing before, while 22% indicated that they did not.

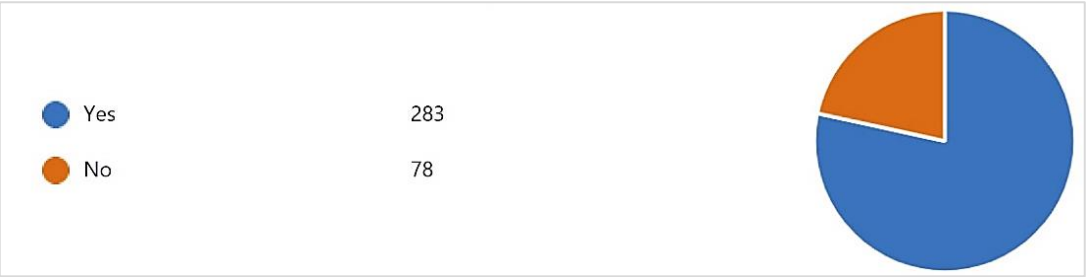


FIGURE 24 BOUGHT SOMETHING BECAUSE OF DIGITAL MARKETING BEFORE IN ABSOLUTE NUMBERS

#### 4.1.2.5 Question 16 – Opinion on most relevant type of Digital Marketing

In question 16 respondents were asked to indicate the most relevant type of digital marketing, visualized in Figure 25. With 47,5%, almost half of all respondents consider social media marketing the most relevant type of digital marketing. The second largest amount of respondents, 15,2%, consider newsletters as most relevant and the third biggest group of 13,9% think influencer marketing is the most relevant. The rest is distributed as follows: 3,6% for “In-App”, 11,1% for “Search Engine Advertisements”, 7,2% for “Video” and 1,6% for “Audio Adverts”.

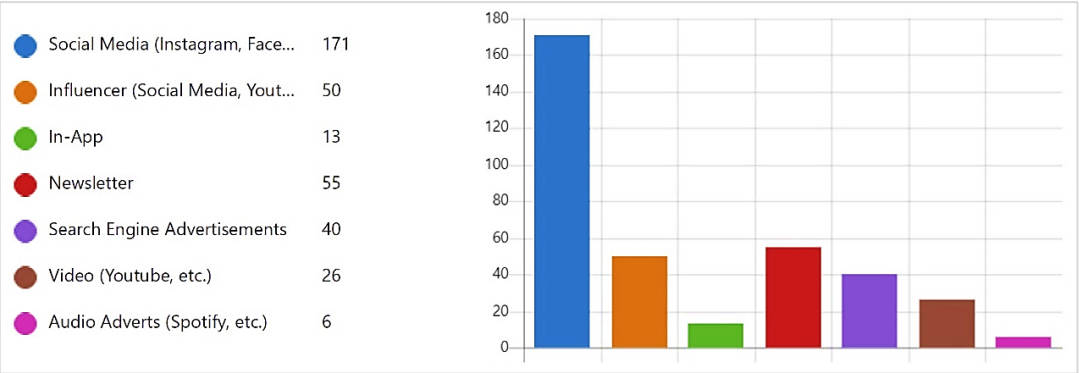


FIGURE 25 OPINION ON MOST RELEVANT TYPE OF DIGITAL MARKETING IN ABSOLUTE NUMBERS

#### 4.1.2.6 Question 17 – Type of store for typical grocery purchase

For the typical type of store for grocery shopping, respondents mostly answered with “Supermarket”, amounting to 71%. 19% of respondents typically do their grocery shopping at a “Discounter” and 10% at an “Organic store”. The distribution is visualized in Figure 26.


FIGURE 26 TYPE OF STORE FOR TYPICAL GROCERY SHOPPING IN ABSOLUTE NUMBERS

#### 4.1.2.7 Question 18 – Amount of plastic packaged goods when shopping

As visible in Figure 27, with 35% most respondents answered that they have 3 to 4 plastic packaged products in their basket, when shopping for at least ten products. Then 30% have more than 5 plastic packaged products in their basked and another 19% answer exactly 5. This implies that 49%, or almost half of all respondents, have a rather high amount of plastic packaged goods in their baskets. 1% of respondents answered with none and 15% with 1 to 2.


FIGURE 27 NUMBER OF PRODUCTS PACKAGED IN PLASTIC IN ABSOLUTE NUMBERS

#### 4.1.2.8 Question 19 – Sustainability Statements, Likert Scale

| | 1 - strongly disagree | | 2 - disagree | | 3 - neutral | | 4 - agree | | 5 - strongly agree | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| **Q19.1** | 2 | 0,6% | 2 | 0,6% | 7 | 1,9% | 86 | 23,8% | 264 | 73,1% |
| **Q19.2** | 0 | 0,0% | 4 | 1,1% | 5 | 1,4% | 100 | 27,7% | 252 | 69,8% |
| **Q19.3** | 0 | 0,0% | 4 | 1,1% | 7 | 1,9% | 75 | 20,8% | 275 | 76,2% |
| **Q19.4** | 1 | 0,3% | 2 | 0,6% | 9 | 2,5% | 81 | 22,4% | 268 | 74,2% |
| **Q19.5** | 11 | 3,0% | 12 | 3,3% | 29 | 8,0% | 138 | 38,2% | 171 | 47,4% |
| **Q19.6** | 4 | 1,1% | 15 | 4,2% | 43 | 11,9% | 127 | 35,2% | 172 | 47,6% |

TABLE 7 AGGREGATED DATA, SUSTAINABILITY STATEMENTS

When looking at the distribution of responses for question 19, it is rather strongly distributed within the ranges of agree and strongly agree. Where for the statements, that aim to analyze

previous knowledge (1-4), for almost every statement over 70% respond with strongly agree and around 20% with agree. Only a very small percentage indicates neutral or disagreement. The distribution looks different for the last two statements, 4 and 5, where less than 50% agree strongly. Here also disagreement and strong disagreement is indicated, but with over 80% for agreement, responses are again almost only allocated in agreement.

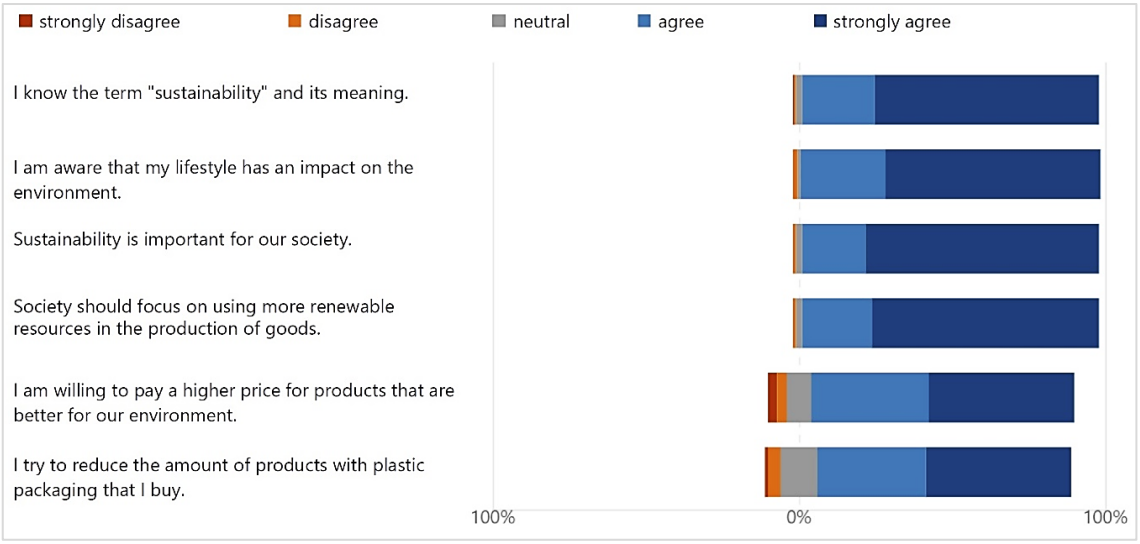


FIGURE 28 SUSTAINABILITY STATEMENTS LIKERT SCALE

## 4.2 Testing of hypotheses

This section presents the results of the hypothesis tests carried out with SPSS. To be able to better analyze certain hypotheses, different variables containing averages have been calculated. These variables are:

- **Level of previous knowledge**: This variable contains the average of responses to questions 19.1-19.4, as these questions are aimed to contain a self-evaluation of the previous knowledge about sustainability.
- **Average rating of posts**: Contains the average rating on different digital marketing types.
- **Average information received**: Contains the average indication of information received from different digital marketing messages.
- **Average opinion change**: Contains the average indication of opinion change from different digital marketing messages.
- **Average intention to inform further**: Contains the average indication of intention to inform further about the topic of plastic pollution based on the different digital marketing messages.

### 4.2.1 H1: There is a relationship between previous knowledge about sustainability and the intention to reduce plastic packaging.

**Correlations**

| | | Level_of_ Previous_ Knowledge | Tries_to_ reduce_plastic |
|---|---|---|---|
| Level_of_Previous_Knowledge | Pearson Correlation | 1 | ,416** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Tries_to_reduce_plastic | Pearson Correlation | ,416** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 8 CORRELATION OF PREVIOUS KNOWLEDGE AND INTENTION TO REDUCE PLASTIC

Hypothesis 1 analyzes the relationship between previous sustainability knowledge of respondents and their existing intention to reduce plastic packaging. As can be seen in Table 8, there is a significant correlation (r=0,416) between the two variables and hence H1 is accepted. As the correlation is positive, it can be assumed that the higher the level of previous knowledge, the higher the predisposition to reduce plastic packaging.

### 4.2.2 H2: There is a relationship between previous knowledge about sustainability and willingness to reduce plastic packaging because of a digital marketing message.

**Correlations**

| | | Level_of_Previous_ Knowledge | Average_ Willingness |
|---|---|---|---|
| Level_of_Previous_Knowledge | Pearson Correlation | 1 | ,227** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Average_Willingness | Pearson Correlation | ,227** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 9 CORRELATION OF PREVIOUS KNOWLEDGE AND AVERAGE WILLINGNESS TO REDUCE

The second hypothesis looks at the relationship between previous knowledge and the willingness to reduce plastic packaging because of a digital marketing message. As the correlation is significant, the hypothesis is accepted despite a relatively low positive correlation (r=0,227). This positive correlation indicates that with more previous knowledge, it can be assumed there will be a higher willingness to reduce plastic packaging stemming from digital marketing messages.

### 4.2.3 H3: There is a relationship between previous knowledge about sustainability and information received from a digital marketing message.

**Correlations**

| | | Level_of_Previous_ Knowledge | Average_Information_ Received |
|---|---|---|---|
| Level_of_Previous_Knowledge | Pearson Correlation | 1 | ,142** |
| | Sig. (2-tailed) | | ,007 |
| | N | 361 | 361 |
| Average_Information_Received | Pearson Correlation | ,142** | 1 |
| | Sig. (2-tailed) | ,007 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 10 CORRELATION OF PREVIOUS KNOWLEDGE AND AVERAGE INFORMATION RECEIVED

Hypothesis 3 is accepted as a significant result with a low positive correlation (r=0,142) is detected. This indicates that previous knowledge has rather low impact on the information that is received from digital marketing messages.

### 4.2.4 H4: There is a relationship between previous knowledge about sustainability and opinion change from a digital marketing message.

**Correlations**

| | | Level_of_Previous_ Knowledge | Average_Opinion_ Change |
|---|---|---|---|
| Level_of_Previous_Knowledge | Pearson Correlation | 1 | ,102 |
| | Sig. (2-tailed) | | ,054 |
| | N | 361 | 361 |
| Average_Opinion_Change | Pearson Correlation | ,102 | 1 |
| | Sig. (2-tailed) | ,054 | |
| | N | 361 | 361 |

TABLE 11 CORRELATION OF PREVIOUS KNOWLEDGE AND OPINION CHANGE

No significant correlation could be detected for H4 and hence the hypothesis is rejected.

### 4.2.5 H5: There is an impact of information received on the opinion on plastic packaging.

**Correlations**

| | | Average_ Opinion_Change | Average_Information_ Received |
|---|---|---|---|
| Average_Opinion_Change | Pearson Correlation | 1 | ,866** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Average_Information_Received | Pearson Correlation | ,866** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 12 CORRELATION OF INFORMATION RECEIVED AND OPINION CHANGE

For hypothesis 5, a significant rather high positive correlation (r=0,866) has been tested. This implies, that the more information a respondent received from a digital marketing message, the higher the change in opinion based upon the marketing message was.

### 4.2.6 H6: There is an impact of the information a consumer receives on the willingness to reduce plastic packaging consumption

**Correlations**

| | | Average_Information_Received | Average_Willingness |
|---|---|---|---|
| Average_Information_Received | Pearson Correlation | 1 | ,625** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Average_Willingness | Pearson Correlation | ,625** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 13 CORRELATION OF INFORMATION RECEIVED AND WILLINGNESS TO REDUCE

The sixth hypothesis test resulted in a significant positive correlation between information received and the willingness to reduce plastic packaging (r=0,625). This means, that the more information a respondent receives from a digital marketing message, the higher the variable of willingness will be.

### 4.2.7 H7: There is a relationship between opinion change and willingness to reduce plastic packaging

**Correlations**

| | | Average_Willingness | Average_Opinion_Change |
|---|---|---|---|
| Average_Willingness | Pearson Correlation | 1 | ,703** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Average_Opinion_Change | Pearson Correlation | ,703** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 14 CORRELATION OF OPINION CHANGE AND WILLINGNESS TO REDUCE

Hypothesis 7 tested the correlation between willingness and opinion change, which yielded a significant positive correlation (r=0,703). Hence a change in opinion increase the willingness to reduce plastic packaging.

### 4.2.8 H8: There is an impact of information received on consumers wanting to know more about the problems of plastic packaging.

**Correlations**

| | | Average_Information_Received | Average_Intention_to_inform_further |
|---|---|---|---|
| Average_Information_Received | Pearson Correlation | 1 | ,574** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Average_Intention_to_inform_further | Pearson Correlation | ,574** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 15 CORRELATION OF INFORMATION RECEIVED AND INTENTION TO REDUCE PLASTIC

Hypothesis 8 examines the relationship of information received and intention to inform further about the topic. The hypothesis test revealed a significant positive correlation of r=0574.

### 4.2.9 H9: There is an impact of changed opinion on consumers wanting to know more about the problems of plastic packaging.

**Correlations**

| | | Average_Intention_to_inform_further | Average_Opinion_Change |
|---|---|---|---|
| Average_Intention_to_inform_further | Pearson Correlation | 1 | ,642** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Average_Opinion_Change | Pearson Correlation | ,642** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 16 CORRELATION OF OPINION CHANGE AND INTENTION TO INFORM FURTHER

The test for a relationship between opinion change and intention to inform further in hypothesis 9 yielded a significant positive result with a correlation of r=0,642.

### 4.2.10 H10: There is an impact of social norm on the willingness to reduce plastic packaging.

**Correlations**

| | | Average_Willingness | Sustainability_is_important |
|---|---|---|---|
| Average_Willingness | Pearson Correlation | 1 | ,201** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Sustainability_is_important | Pearson Correlation | ,201** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 17 CORRELATION OF SOCIAL NORM AND WILLINGNESS TO REDUCE

In the test for hypothesis 10, the correlation between social norm and willingness to reduce is investigated. The test yielded a significant result with a low positive correlation (r=0,201).

### 4.2.11 H11: There is a relationship between willingness to pay more and willingness to reduce plastic packaging

**Correlations**

| | | Average_ Willingness | Willing_ to_pay_more |
|---|---|---|---|
| Average_Willingness | Pearson Correlation | 1 | ,230** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Willing_to_pay_more | Pearson Correlation | ,230** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 18 CORRELATION OF WILLINGNESS TO PAY MORE AND WILLINGNESS TO REDUCE

For hypothesis 11 a significant low correlation (r=0,230) between willingness to reduce and willingness to pay more has been identified. This implies that, respondents who are willing to pay more for products that are not packaged in plastic, have a higher willingness to buy less plastic because of digital marketing.

### 4.2.12 H12: There is a difference in trust between people who already bought products because of digital marketing and those who did not

**Ranks**

| | Bought_because_of_digital_ marketing_before | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Serious_Trust_digital_marketing | No | 78 | 223,54 | 17436,50 |
| | Yes | 283 | 169,27 | 47904,50 |
| | Total | 361 | | |

TABLE 19 MEAN RANKS - DIFFERENCE IN TRUST BETWEEN PEOPLE WHO BOUGHT BEFORE AND THOSE WHO DID NOT

**Test Statistics[a]**

| | Serious_Trust_digital_marketing |
|---|---|
| Mann-Whitney U | 7718,500 |
| Wilcoxon W | 47904,500 |
| Z | -4,211 |
| Asymp. Sig. (2-tailed) | ,000 |

a. Grouping Variable: Bought_because_of_digital_marketing_before

TABLE 20 MANN WHITNEY U TEST RESULTS

To test hypothesis 12, a Mann-Whitney-U test for group differences was applied. The test yielded a significant result and hence the hypothesis is accepted. For the group that answered "yes" in question 15, the lower mean rank for trust in digital marketing was calculated. As the scale for trust was 1 (strongly agree) to 5 (strongly disagree), the lower the value of the mean rank the higher the agreement indicated was. This indicates, that respondents, who have answered "yes", have a higher level of trust in digital marketing.

### 4.2.13 H13: There is a relationship between consumers trying to reduce plastic packaging and the amount that is typically in their basket

**Correlations**

| | | Number_of_ items_plastic | Tries_to_reduce _plastic |
|---|---|---|---|
| Number_of_items_plastic | Pearson Correlation | 1 | -,258** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Tries_to_reduce_plastic | Pearson Correlation | -,258** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 21 CORRELATION OF NUMBER OF PLASTIC PACKAGED ITEMS AND INTENTION TO REDUCE PLASTIC

The test for correlation of the number of items packaged in plastic and the intention of a respondent to reduce plastic packaging resulted in a significant low negative correlation (r=-0,258). This indicates that if the intention to reduce plastic is stronger, the amount of plastic packaged items is lower.

### 4.2.14 H14: There is a relationship between rating of a post and the willingness to reduce plastic packaging.

**Correlations**

| | | Average_Rating_ of_Post | Average_ Willingness |
|---|---|---|---|
| Average_Rating_of_Post | Pearson Correlation | 1 | ,527** |
| | Sig. (2-tailed) | | ,000 |
| | N | 361 | 361 |
| Average_Willingness | Pearson Correlation | ,527** | 1 |
| | Sig. (2-tailed) | ,000 | |
| | N | 361 | 361 |

**. Correlation is significant at the 0.01 level (2-tailed).

TABLE 22 CORRELATION OF RATING OF A POST AND WILLINGNESS TO REDUCE

Hypothesis 14 investigates the correlation between the rating of a post and the willingness to reduce plastic packaging. The test for correlation detected a significant positive correlation (r=0,527). Thus, the better a post is rated, the higher the willingness to reduce plastic.

### 4.2.15 H15: There is a difference in willingness to reduce plastic between types of digital marketing.

**Ranks**

| | Mean Rank |
|---|---|
| Instagram_Willingness_to_reduce | 2,14 |
| Facebook_Willingness_to_reduce | 2,48 |
| Influencer_Willingness_to_reduce | 2,60 |
| In_App_Willingness_to_reduce | 2,78 |

TABLE 23 MEAN RANKS FRIEDMAN TEST

**Test Statistics[a]**

| | |
|---|---|
| N | 361 |
| Chi-Square | 81,357 |
| df | 3 |
| Asymp. Sig. | ,000 |

a. Friedman Test

TABLE 24 TEST STATISTICS FRIEDMAN TEST

Hypothesis 15 assumes that there is a difference in willingness to reduce caused by the different types of digital marketing. To detect the presence of such a difference, a Friedman test was carried out and yielded a significant result with p=0,000 < 0,001 < 0,05. In order to identify which

type of digital marketing is most effective at influencing the willingness to reduce, a Wilcoxon signed rank test was then applied. Then a Bonferroni correction was used on the significance level, which results in a new significance level of p=0,05/6=0,008333. The Wilcoxon signed rank test, resulted in six tests which compare Facebook with Instagram, Influencer with Instagram, In-App with Instagram, Influencer with Facebook, In-App with Facebook and In-App with Influencer marketing.

**Ranks**

| | | N | Mean Rank | Sum of Ranks |
|---|---|---|---|---|
| Facebook_Willingness_to_reduce - Instagram_Willingness_to_reduce | Negative Ranks | 65[a] | 91,34 | 5937,00 |
| | Positive Ranks | 130[b] | 101,33 | 13173,00 |
| | Ties | 166[c] | | |
| | Total | 361 | | |
| Influencer_Willingness_to_reduce - Instagram_Willingness_to_reduce | Negative Ranks | 58[d] | 94,29 | 5469,00 |
| | Positive Ranks | 145[e] | 105,08 | 15237,00 |
| | Ties | 158[f] | | |
| | Total | 361 | | |
| In_App_Willingness_to_reduce - Instagram_Willingness_to_reduce | Negative Ranks | 53[g] | 87,07 | 4614,50 |
| | Positive Ranks | 164[h] | 116,09 | 19038,50 |
| | Ties | 144[i] | | |
| | Total | 361 | | |
| Influencer_Willingness_to_reduce - Facebook_Willingness_to_reduce | Negative Ranks | 71[j] | 78,69 | 5587,00 |
| | Positive Ranks | 94[k] | 86,26 | 8108,00 |
| | Ties | 196[l] | | |
| | Total | 361 | | |
| In_App_Willingness_to_reduce - Facebook_Willingness_to_reduce | Negative Ranks | 66[m] | 85,02 | 5611,50 |
| | Positive Ranks | 124[n] | 101,08 | 12533,50 |
| | Ties | 171[o] | | |
| | Total | 361 | | |
| In_App_Willingness_to_reduce - Influencer_Willingness_to_reduce | Negative Ranks | 68[p] | 81,51 | 5542,50 |
| | Positive Ranks | 103[q] | 88,97 | 9163,50 |
| | Ties | 190[r] | | |
| | Total | 361 | | |

a – r can be found in Appendix 3

TABLE 25 MEAN RANKS WILCOXON SIGNED RANK TEST

**Test Statistics[a]**

| | Facebook_Willingness_to_reduce - Instagram_Willingness_to_reduce | Influencer_Willingness_to_reduce - Instagram_Willingness_to_reduce | In_App_Willingness_to_reduce - Instagram_Willingness_to_reduce | Influencer_Willingness_to_reduce - Facebook_Willingness_to_reduce | In_App_Willingness_to_reduce - Facebook_Willingness_to_reduce | In_App_Willingness_to_reduce - Influencer_Willingness_to_reduce |
|---|---|---|---|---|---|---|
| Z | -4,781[b] | -6,007[b] | -8,002[b] | -2,128[b] | -4,714[b] | -2,882[b] |
| Asymp. Sig. (2-tailed) | ,000 | ,000 | ,000 | ,033 | ,000 | ,004 |

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

TABLE 26 TEST STATISTICS WILCOXON TEST

Based on the new level of significance, five significant differences have been identified. No significant difference between Facebook and Influencer could be detected. Based upon the positive mean ranks, the In-App advertisement has had higher positive mean ranks than Facebook, Instagram as well the Influencer post. This indicates that an In-App advertisement has the highest impact on increased willingness to reduce plastic packaging in the online survey.

### 4.2.16 HD1: There is a difference in willingness to reduce plastic between age groups

**Ranks**

| | Age | N | Mean Rank |
|---|---|---|---|
| Average_Willingness | 18-24 | 84 | 187,26 |
| | 25-34 | 140 | 146,71 |
| | 35-44 | 41 | 189,74 |
| | 45-54 | 46 | 211,96 |
| | 55-64 | 34 | 221,90 |
| | 65+ | 16 | 249,81 |
| | Total | 361 | |

TABLE 27 MEAN RANKS KRUSKAL WALLIS WILLINGNESS TO REDUCE PER AGE GROUP

**Test Statistics[a,b]**

| | Average_Willingness |
|---|---|
| Chi-Square | 32,269 |
| df | 5 |
| Asymp. Sig. | ,000 |

a. Kruskal Wallis Test
b. Grouping Variable: Age

TABLE 28 TEST STATISTICS KRUSKAL WALLIS HD1

Hypothesis D1 considers a difference in willingness to reduce plastic packaging between age groups. The statistical test yielded a significant result and hence the hypothesis is accepted. By looking at the mean ranks in Table 27, one can see, that the willingness increases with age of respondents, with one exception where for the group of 25-34 a lower willingness compared to 18-24 was identified.

### 4.2.17 HD2: There is a difference in willingness to reduce plastic based on place of residence

**Ranks**

| | Location | N | Mean Rank |
|---|---|---|---|
| Average_Willingness | Rural area or village | 110 | 199,54 |
| | Small City | 55 | 205,93 |
| | City | 58 | 187,38 |
| | Big City | 138 | 153,61 |
| | Total | 361 | |

TABLE 29 MEAN RANKS KRUSKAL WALLIS WILLINGNESS TO REDUCE PER PLACE OF RESIDENCE

**Test Statistics[a,b]**

| | Average_Willingness |
|---|---|
| Chi-Square | 16,507 |
| df | 3 |
| Asymp. Sig. | ,001 |

a. Kruskal Wallis Test
b. Grouping Variable: Location

TABLE 30 TEST STATISTICS KRUSKAL WALLIS HD2

The test for hypothesis HD2 resulted in a significant result. The mean ranks reveal that the highest willingness to reduce plastic packaging is present in small cities and rural areas.

### 4.2.18 HD3: There is a difference in willingness to reduce plastic between income groups

**Ranks**

| | Salary | N | Mean Rank |
|---|---|---|---|
| Average_Willingness | <15000€ | 95 | 182,89 |
| | 15001€-30000€ | 113 | 184,23 |
| | 30001€-45000€ | 80 | 180,54 |
| | 45001€-60000€ | 34 | 184,34 |
| | 60001€-75000€ | 12 | 184,67 |
| | 75001€-90000€ | 12 | 188,04 |
| | >90001€ | 15 | 130,97 |
| | Total | 361 | |

TABLE 31 MEAN RANKS KRUSKAL WALLIS WILLINGNESS TO REDUCE PER INCOME GROUP

**Test Statistics[a,b]**

| | Average_Willingness |
|---|---|
| Chi-Square | 3,733 |
| df | 6 |
| Asymp. Sig. | ,713 |

a. Kruskal Wallis Test
b. Grouping Variable: Salary

TABLE 32 TEST STATISTICS KRUSKAL WALLIS HD3

For hypothesis D3, no significant difference in willingness to reduce plastic between income groups has been identified, hence the hypothesis is rejected.

### 4.2.19 HD4: There is a difference in willingness to reduce plastic between genders

**Ranks**

| | Gender | N | Mean Rank |
|---|---|---|---|
| Average_Willingness | female | 182 | 196,36 |
| | male | 176 | 162,06 |
| | Total | 358 | |

TABLE 33 MEAN RANKS KRUSKAL WALLIS WILLINGNESS TO REDUCE PER GENDER

**Test Statistics[a,b]**

| | Average_Willingness |
|---|---|
| Chi-Square | 9,935 |
| df | 1 |
| Asymp. Sig. | ,002 |

a. Kruskal Wallis Test
b. Grouping Variable: Gender

TABLE 34 TEST STATISTICS KRUSKAL WALLIS HD4

Hypothesis HD4 assumes a difference in willingness to reduce plastic packaging between genders. The statistical test yielded a significant result and hence the hypothesis is accepted. The mean ranks in Table 33 reveal that the willingness is higher in female respondents than in male respondents.

### 4.2.20 HD5: There is a difference in willingness to reduce plastic between levels of education

**Ranks**

| | Education | N | Mean Rank |
|---|---|---|---|
| Average_Willingness | Compulsory school | 17 | 225,85 |
| | Apprenticeship | 53 | 222,25 |
| | Highschool | 129 | 180,10 |
| | University (Bachelor) | 81 | 162,23 |
| | University (Master) | 69 | 159,54 |
| | University (Dr., PhD, Engineer's degree) | 12 | 194,96 |
| | Total | 361 | |

TABLE 35 MEAN RANKS KRUSKAL WALLIS WILLINGNESS TO REDUCE PER LEVEL OF EDUCATION

**Test Statistics[a,b]**

| | Average_Willingness |
|---|---|
| Chi-Square | 17,367 |
| df | 5 |
| Asymp. Sig. | ,004 |

a. Kruskal Wallis Test
b. Grouping Variable: Education

TABLE 36 TEST STATISTICS KRUSKAL WALLIS HD5

The statistical analysis for hypothesis HD5 revealed a significant result, thus the hypothesis is accepted. Table 35 shows that the mean rank for the group "Compulsory school" and "Apprenticeship" are the highest, which indicates, that in these groups the willingness of respondents has been the highest.

### 4.2.21 HD6: There is a difference in willingness to reduce plastic based upon usual type of store for grocery shopping

**Ranks**

| | Typical_grocery_shoping | N | Mean Rank |
|---|---|---|---|
| Average_Willingness | Discounter | 74 | 175,73 |
| | Supermarket | 254 | 183,48 |
| | Organic store | 33 | 173,76 |
| | Total | 361 | |

TABLE 37 MEAN RANKS KRUSKAL WALLIS WILLINGNESS TO REDUCE PER USUAL TYPE OF STORE

**Test Statistics[a,b]**

| | Average_Willingness |
|---|---|
| Chi-Square | ,496 |
| df | 2 |
| Asymp. Sig. | ,780 |

a. Kruskal Wallis Test
b. Grouping Variable: Typical_grocery_shoping

TABLE 38 TEST STATISTICS KRUSKAL WALLIS HD6

The statistical test for hypothesis D6 did not yield a significant result, hence the hypothesis is rejected.

### 4.2.22 HD7: There is a difference in opinion change between age groups

**Ranks**

| | Age | N | Mean Rank |
|---|---|---|---|
| Average_Opinion_Change | 18-24 | 84 | 180,11 |
| | 25-34 | 140 | 147,48 |
| | 35-44 | 41 | 204,12 |
| | 45-54 | 46 | 212,47 |
| | 55-64 | 34 | 209,75 |
| | 65+ | 16 | 268,19 |
| | Total | 361 | |

TABLE 39 MEAN RANKS KRUSKAL WALLIS OPINION CHANGE PER AGE GROUP

**Test Statistics[a,b]**

| | Average_Opinion_Change |
|---|---|
| Chi-Square | 34,643 |
| df | 5 |
| Asymp. Sig. | ,000 |

a. Kruskal Wallis Test
b. Grouping Variable: Age

TABLE 40 TEST STATISTICS KRUSKAL WALLIS HD7

The result of the test for hypothesis HD7, which assumes a difference in opinion change between age groups, was significant. In Table 39, the mean ranks imply that rating on changed opinion has been the lowest for respondents in the group 25-34 and highest for the group of 65+. A tendency for higher rating seems to be present in older age groups.

### 4.2.23 HD8: There is a difference in opinion change between levels of education.

**Ranks**

| | Education | N | Mean Rank |
|---|---|---|---|
| Average_Opinion_Change | Compulsory school | 17 | 244,62 |
| | Apprenticeship | 53 | 232,18 |
| | Highschool | 129 | 175,49 |
| | University (Bachelor) | 81 | 159,46 |
| | University (Master) | 69 | 161,86 |
| | University (Dr., PhD, Engineer's degree) | 12 | 179,50 |
| | Total | 361 | |

TABLE 41 MEAN RANKS KRUSKAL WALLIS OPINION CHANGE PER LEVEL OF EDUCATION

**Test Statistics[a,b]**

| | Average_Opinion_Change |
|---|---|
| Chi-Square | 25,380 |
| df | 5 |
| Asymp. Sig. | ,000 |

a. Kruskal Wallis Test
b. Grouping Variable: Education

TABLE 42 TEST STATISTICS KRUSKAL WALLIS HD8

A significant result was calculated for hypothesis HD8, which expects a difference opinion change between different levels of education. Considering the mean ranks in Table 41, respondents with lower levels of education indicate that a higher change in opinion. There is little difference in higher levels of education such as high school and University. In aggregate, these levels have generally rated opinion change lower.

### 4.2.24 HD9: There is a difference in information received between levels of education.

**Ranks**

| | Education | N | Mean Rank |
|---|---|---|---|
| Average_Information_Received | Compulsory school | 17 | 236,53 |
| | Apprenticeship | 53 | 210,08 |
| | Highschool | 129 | 182,96 |
| | University (Bachelor) | 81 | 161,32 |
| | University (Master) | 69 | 167,84 |
| | University (Dr., PhD, Engineer's degree) | 12 | 161,33 |
| | Total | 361 | |

TABLE 43 MEAN RANKS KRUSKAL WALLIS INFORMATION RECEIVED PER LEVEL OF EDUCATION

**Test Statistics[a,b]**

| | Average_Information_Received |
|---|---|
| Chi-Square | 13,495 |
| df | 5 |
| Asymp. Sig. | ,019 |

a. Kruskal Wallis Test
b. Grouping Variable: Education

TABLE 44 TEST STATISTICS KRUSKAL WALLIS HD9

The analysis of HD9, assuming a difference in information received between levels of education, resulted in a significant difference. Here respondents with lower levels of education have indicated to have received more information, while higher levels of education have indicated less information received. Respondents holding an academic degree have indicated to have received the least amount of new information.

### 4.2.25 HD10: There is a difference in information received between age groups.

**Ranks**

| | Age | N | Mean Rank |
|---|---|---|---|
| Average_Information_Received | 18-24 | 84 | 185,96 |
| | 25-34 | 140 | 156,44 |
| | 35-44 | 41 | 195,74 |
| | 45-54 | 46 | 204,34 |
| | 55-64 | 34 | 189,88 |
| | 65+ | 16 | 246,06 |
| | Total | 361 | |

TABLE 45 MEAN RANKS KRUSKAL WALLIS INFORMATION RECEIVED PER AGE GROUP

**Test Statistics[a,b]**

| | Average_Information_Received |
|---|---|
| Chi-Square | 17,679 |
| df | 5 |
| Asymp. Sig. | ,003 |

a. Kruskal Wallis Test
b. Grouping Variable: Age

TABLE 46 TEST STATISTICS KRUSKAL WALLIS HD10

Analysis of difference in information received between age groups yielded a significant result and hence hypothesis HD10 is accepted. The mean ranks show that the age group of 65+ indicated the highest level of information received. No tendency, that with lower or a higher age information received increases or decreases can be observed, but there are clear differences between the age groups.

## 4.3 Overview of results of hypothesis tests

| *Hypothesis* | Accepted | Rejected |
|---|---|---|
| *H1* | X | |
| *H2* | X | |
| *H3* | X | |
| *H4* | | X |
| *H5* | X | |
| *H6* | X | |
| *H7* | X | |
| *H8* | X | |
| *H9* | X | |
| *H10* | X | |
| *H11* | X | |
| *H12* | X | |
| *H13* | X | |
| *H14* | X | |
| *H15* | X | |

| *Hypothesis* | Accepted | Rejected |
|---|---|---|
| *HD1* | X | |
| *HD2* | X | |
| *HD3* | | X |
| *HD4* | X | |
| *HD5* | X | |
| *HD6* | | X |
| *HD7* | X | |
| *HD8* | X | |
| *HD9* | X | |
| *H10* | X | |

TABLE 47 OVERVIEW OF HYPOTHESIS TEST RESULTS

Table 47 presents an overview of the results of the statistical tests for each hypothesis. Three hypotheses, namely H4, HD3 and HD6, have been rejected, while the other hypothesis tested significant and have hence been accepted.

# 5 DISCUSSION & LIMITATIONS

This chapter discusses the findings of the online survey and analyzes possible links between different hypotheses. Further, limitations of this research are pointed out and explained.

## 5.1 Discussion

The online survey aims to collect data on the impact of digital marketing on consumer behavior in the field of plastic packaging. To attain this goal, it was designed to answer the research questions of this thesis via testing the hypothesis based on the collected data through SPSS.

Based upon the theory of planned behavior, knowledge is considered to be a core element of the attitude of a consumer (Ajzen, 1991), indicating that previous knowledge about the topic of sustainability and plastic pollution should play a role when it comes to consumer behavior. This relationship was tested through hypotheses H1 to H4, where a significant correlation in H1 to H3 was identified. The results imply that previous knowledge, as a factor that forms the attitude of consumers, plays a role when it comes to consumer behavior in the field of plastic. Based upon this finding, it can be reasoned that, when a higher level of previous knowledge is present, the general intention of a consumer to reduce plastic packaging is higher. Further, also the willingness to reduce plastic packaging stemming from a digital marketing message is increased by the level of previous knowledge. Information is considered to be a component that influences knowledge and hence the attitude of a consumer. The results of the survey reveal that the more information a consumer receives from a marketing message, the more the opinion on the topic changes and additionally the willingness to reduce plastic packaging increases. As there is also a significant relationship with a rather high correlation between opinion change and the willingness to reduce plastic packaging present, this further strengthens the importance of information when it comes to influencing consumer behavior. The analysis also reveals, that when consumers receive a higher amount of information, they indicated a higher intention to inform further about the topic. This also holds true for changed opinion, where a higher change in opinion leads to a higher intention to inform further.

This reveals that information proves to be a crucial factor when it comes to influencing consumer behavior. In this way the factor of information has been identified to have multi-level impact on consumer behavior, via previous knowledge, opinion change and information received in the field of digital marketing.

The rating of a post, which includes the elements of design, length, information contained and attractiveness, has been identified to impact the willingness to reduce plastic as well. Again, the set of criteria contains information, but it in addition this indicates, that a digital marketing message needs to be attractive to consumers as well, to increase the impact on consumer behavior.

| ★★★½☆ | ★★★½☆ | ★★★★☆ | ★★★★☆ |
|---|---|---|---|
| 3.55 Average Rating | 3.64 Average Rating | 3.79 Average Rating | 4.08 Average Rating |
| Instagram | Facebook | Influencer | In-App Ad |

TABLE 48 DIGITAL MARKETING RATINGS PER TYPE

Table 48 illustrates that respondents indicated higher ratings for the in-app advertisements and for the influencer post, which were also statistically identified to have a rather high impact on consumer behavior. This implies that an in-app advertisement, which is a form of mobile marketing explained in sub section 2.3.2.5, has the highest statistical impact as well as the highest rating be respondents, but also the other types of digital marketing have potential to influence consumer behavior.

When looking at the element of social norm, only a low correlation with the willingness to reduce plastic packaging can be observed. This is likely explained by the fact, that digital marketing is usually consumed alone without any social peer pressure being present. Nevertheless, the significant low correlation indicates, that a social component in a marketing message impacts consumer behavior.

The factor of control, which is also described in the theory of planned behavior by Ajzen (1991), has also been identified to impact the willingness to reduce plastic packaging. This is derived from the correlation with willingness to pay more, as the factor of control is influenced by monetary means. Considering, that on average, with 4.08 out of 5, the in-app message was rated the highest out of all digital marketing types, an in-app message could proof to be the most effective in influencing consumer behavior. This assumption is further strengthened when comparing the mean ranks of the different forms of digital marketing in terms of rating of willingness to reduce plastic packaging, where the in-app advertisement has the highest mean ranks.

Analysis of demographic factors that might impact consumer behavior has also revealed significant results that are worth to be discussed. Data analysis reveals that there is a difference in the willingness to reduce plastic, with a tendency of older age groups to indicate a higher willingness. It is further revealed that, consumers with a place of residence in a rural area indicate a higher willingness compared to consumers from urban areas. The willingness also differs between female and male respondents where female respondents indicate a higher willingness.

Additional testing unveiled that the highest level of education also impacts the willingness to reduce plastic packaging, where lower levels of education such as “Compulsory school” and “Apprenticeship” (see Table 35) indicate the highest willingness. It is also revealed that opinion change is the highest in older age groups and consumers with lower levels of highest education. This makes sense as the groups with lower levels of education also indicate to have received more information from the marketing messages. The difference of information received between age groups was also analyzed and revealed that older age groups indicate a high level of received information. As was pointed out before, information seems to be a crucial element to

influence consumer behavior, this is demonstrated again by the results of this analysis. Further, these results in terms of demographics indicate that it is rather important to precisely define target groups for digital marketing to achieve the highest impact on consumer behavior.

## 5.2 Limitations

The chosen research instrument and the applied sampling technique yielded valuable insights that helped answering the research questions. Yet there are limitations to the research that must be considered.

When looking at the data, gathered from the research instrument, it seems that the majority of respondents is well informed about sustainability and considers the topic to be important (see section 4.1.2.8). As pointed out in the literature by Cotte and Truedl (2009), it appears to hold true, that surveys under the theme of sustainability lead respondents to indicate higher values on sustainability than they actually value the topic in their life. While the online survey was designed to not transport the topic of sustainability early on, it can be assumed that the presented marketing messages and the final questions nevertheless resulted in this kind of behavior of respondents.

Another limitation concerning the online survey, is the lack of questions, that specifically aim at gathering data on the emotions of respondents. While marketing messages were designed to invoke emotions, no question asks respondents whether actual emotion was aroused. This also limits the possibility to reason that a marketing message, that is assumed to generate a higher level of emotion, has a higher impact on consumer behavior of respondents.

Lastly, other noteworthy limitations are imposed by the chosen sampling method of convenience sampling. Firstly, it imposes a selection bias, as the researcher self-selects respondents. Secondly this method of sampling is not considered to be representative of a general population (Malhotra et al., 2017).

# 6 CONCLUSION

## 6.1 Summary

The problem of plastic pollution has grown to be a threat to our ecosystem as well as society. A constant increase in worldwide plastic production over the last years, logically leads to an increase in plastic waste generation. This poses a problem due the materials properties, such as durability, flexibility and its very chemical structure based on polymers that never fully degrade. These properties make the resulting waste long lasting, hard to deal with for existing waste management systems and ultimately result in plastic waste or microplastics spreading all over the planet. One main driver of this problem has been identified to be the widespread usage of single use plastics, that is commonly used for many types of food and consumer good packaging. With a lifespan of less than one year, this type of plastic logically generates a high amount of waste and hence are a sector that consumers can make a difference in, by decreasing the waste they generate.

Another phenomenon, that became omnipresent with the increasing digitalization of our society over recent years, is the field of digital marketing. It presents a cost effective and fast way to reach a rather big audience that can be easily targeted via the tools provided by such digital marketing instruments. This has led this research to consider digital marketing as a relevant tool to analyze whether it can be leveraged to alter consumer behavior in the field of sustainability focusing on plastic packaging.

Based on this information, this research raised two interdisciplinary research questions, RQ1, “Can digital marketing induce behavioral change in consumers towards a reduction of plastic waste?” and RQ2, “Which form of digital marketing has the highest impact on buying decisions in terms of plastic packaging?”. These questions aim to combine to realms of digital marketing, sustainability and consumer behavior with the goal of developing one possible approach to solve a real-world problem, namely plastic pollution by leveraging digital marketing that applies literature-based consumer behavior theories. To answer the research questions, first the core concepts were explained in detail by reviewing relevant literature on the topics of plastic, digital marketing and consumer behavior. Based on this literature review, a conceptual framework was developed that helped to derive hypotheses for data analysis.

In order to gather relevant data from consumers, a quantitative research approach was applied, where an online survey was developed, based upon the concepts identified in the literature. This survey included digital marketing messages that were based upon consumer behavior theories to influence consumer behavior. To collect responses, the sampling technique of convenience sampling was applied, where the researcher’s social media networks, private and work email lists were used to spread the survey. Within a collection timeframe of three weeks, 361

responses were collected and then analyzed through SPSS using statistical tests to test the hypotheses.

This analyzes revealed that most hypotheses proved to be significant and revealed correlations between the variables of the research. A core revelation was, that the factor of information plays a crucial role in the effectiveness of digital marketing when trying to influence consumer behavior. It directly correlates with buying behavior as well as environmental awareness and impacts the factors of opinion as well as consumer intention to further inform about the topic of plastic pollution. This indicates that digital marketing is effective when it comes to influencing consumer behavior in terms of plastic packaging. Further it was revealed, that out of the three types of digital marketing that were used within the survey, namely social media, influencer and mobile marketing in form of native advertisements, the native in-app advertisement had the highest impact on consumer willingness to reduce plastic packaging.

## 6.2 Contribution to knowledge

One core component of this research was the theory of planned behavior by Icek Ajzen (1991), which partly provided the basis for designing the conceptual framework (see Figure 8 in section 2.4). The elements that guide behavior, namely subjective norm, attitude toward a behavior and perceived control, were used to design the digital marketing messages and guided the design of the hypotheses to test the research question. This implies that the theory by Ajzen (1991) can be used for designing a digital marketing message to impact consumer behavior in modern times, where digital marketing is omnipresent. In this way, the theory of theory of planned behavior by Icek Ajzen (1991) was tested empirically and found to be relevant when focusing on new media and new forms of information transmission.

## 6.3 Implications for relevant stakeholders

This research looks at one possible approach to solve a real-world problem, namely the problem of plastic pollution, hence there are many relevant stakeholders involved. Society as a whole can be considered to be a stakeholder as well as businesses, NGOs and governmental bodies. Since this research looks at digital marketing as an enabler to influence consumer behavior in order to make a positive impact on the problem of plastic waste, it makes sense to neglect society as a stakeholder and focus on businesses, NGOs and governments as relevant stakeholders.

As analyzed in section 5.1, information plays a crucial role in influencing consumer behavior. This fact can be of usage to businesses, NGOs and governments, that aim at reducing plastic waste. To achieve such a goal, digital marketing can provide a rather cost effective and fast way to reach consumers with a marketing message. The cost effectiveness can be argued to make it especially useful for NGOs, considering that they often have to work on limited budgets. Such a

message could then utilize the insights gained from this research by including valuable information that increases the knowledge of consumers, which in turn impacts buying behavior as well as opinion on the topic.

In this way, digital marketing can be considered an instrument that has a broad effect in terms of awareness raising and also education in the field of sustainability. Thus, digital marketing could potentially help to alter customers preferences in a way that consumers by themselves ultimately make more sustainable shopping choices.

## 6.4 Future research

In section 5.2 limitations of this research are examined. These limitations provide a basis for future research in the field of digital marketing and sustainable consumer behavior.

First, as the digital marketing messages, that are used in this research, are designed to invoke emotions, but no questions analyze whether actual emotions are felt by respondents, it is recommended for future research to include a variable of emotion. This will help to draw reliable conclusions on whether emotions play a role when influencing consumer behavior.

Second, the type of sampling limits the generalizability of the results of this thesis. Hence it is recommended to choose a different sampling technique that allows for generalizability.

Third, further research regarding the topic could look at other types of digital marketing. The results of the survey indicate that respondents consider newsletters and search engine advertisements as relevant forms of digital marketing (see Figure 25). This implies, that these types of digital marketing could also be relevant instruments to impact consumer behavior.

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# APPENDICES

## Appendix 1: Online Survey in English

English (United States)

# Impact of Digital Marketing on Consumer Behavior

This survey aims to analyze the effect of digital marketing on consumer behavior. Three different types of digital marketing will be discussed: Social Media, Influencer and In-App marketing. The results of this survey will be used within the context of a master's thesis that aims to analyze the interaction between digital marketing and consumer behavior. All responses are completely anonymous and are only used for statistical analysis.

It takes approximately 8-10 minutes to complete this survey.

Your participation is greatly appreciated!

* Required

### Demographic Information

In this section you will be asked about your demographic information. The data will remain completely anonymous.

1

Gender *

- ◯ male
- ◯ female
- ◯ non-binary
- ◯ no answer

2

Age *

- ◯ 18-24
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55-64
- ◯ 65+

3

Highest level of education *

- ◯ Compulsory school
- ◯ Apprenticeship/Technical or Vocational training
- ◯ Highschool diploma
- ◯ University (Bachelor)
- ◯ University (Master)
- ◯ University (Dr., PhD, Engineer's degree)

4

Net Income level *

- ◯ < 15.000€
- ◯ 15.001€ - 30.000€
- ◯ 30.001€ - 45.000€
- ◯ 45.001€ - 60.000€
- ◯ 60.001€ - 75.000€
- ◯ 75.001€ - 90.000€
- ◯ > 90.000€

5

Place of residence *

- ◯ Rural area or village
- ◯ Small city (5.000 - 10.000 citizens)
- ◯ City (10.001 - 100.000 citizens)
- ◯ Big city (>100.000 citizens)

Digital Marketing - Instagram

6

Please rate the following post (Content, Quality, Length, Attractiveness) *

*Link to the original post: https://www.instagram.com/p/CISwSAUHJjA/ (https://www.instagram.com/p/CISwSAUHJjA/)*


☆ ☆ ☆ ☆ ☆

7

In this question an array of statements is presented. Please indicate how much you agree with each statement. *

| | strongly disagree | disagree | neutral | agree | strongly agree |
|---|---|---|---|---|---|
| I learned something new because of this post. | ○ | ○ | ○ | ○ | ○ |
| This post has changed my opinion on plastic packaging. | ○ | ○ | ○ | ○ | ○ |
| I am willing to reduce the amount of plastic packaging I buy, because of this post. | ○ | ○ | ○ | ○ | ○ |
| I want to learn more about this topic, because of this post. | ○ | ○ | ○ | ○ | ○ |

## Digital Marketing - Facebook

8

Please rate the following posting (Content/Information, Quality, Length, Attractiveness) *

*"It is absurd: By cleaning our houses/aprtments with ordinary household cleaning products we still leave dirt. Despite this dirt is not visible in our own property, it is very visibile on our planet. With every additional empty cleaning product packaging we pollute the world with more not really recyclable plastic.*

*Did you know, that in German 1.9 Million single-use plastic bottles are used? Per day this amounts to 45 Million pieces. This means, that on average every German citizen uses 200 single-use plastic bottle. We can reduce these numbers! We reuse our coffe-2-go cup time and time again, we refill our soap dispenser and there is even solid shower soap available. Why not household cleaning products?! We say, household cleaning products should not pollute our environment!* ✕

*For this reason we developed cleaning tabs, that only contain the minimum needed amount of ingredients and are easily biodegradable without compromising on cleaning power. Our cleaning product bottles are made from 100% recycled PET (with the only exception of the spray nozzle) and we made sure they can be reused for a very long time.* 💚 *Many commonly used household cleaning products even contain substances that cannot be filtered out by sewage treatment plants.* 🤢 *So in terms of environment, your own health and also your wallet, it pays off to use sustainable cleaning products.* 😷 *Lets make the world a cleaner place together* 🌬🌍 *"*

*Translation of the picture: "Should cleaning products pollute the planet?"*

*Link to the original post: https://www.facebook.com/everdrop.de/photos/a.140482190737244/340181357433992/ (https://www.facebook.com/everdrop.de/photos/a.140482190737244/340181357433992/)*


☆ ☆ ☆ ☆ ☆

9

In this question an array of statements is presented. Please indicate how much you agree with each statement. *

| | strongly disagree | disagree | neutral | agree | strongly agree |
|---|---|---|---|---|---|
| I learned something new because of this post. | ○ | ○ | ○ | ○ | ○ |
| This post has changed my opinion on plastic packaging. | ○ | ○ | ○ | ○ | ○ |
| I am willing to reduce the amount of plastic packaging I buy, because of this post. | ○ | ○ | ○ | ○ | ○ |
| I want to learn more about this topic, because of this post. | ○ | ○ | ○ | ○ | ○ |

## Digital Marketing - Influencer

10

Please rate the following post (Content/Information, Quality, Length, Attractiveness) *

*Link to the original post: https://www.instagram.com/p/BzQmbLBn5gE/ (https://www.instagram.com/p/BzQmbLBn5gE/)*


☆ ☆ ☆ ☆ ☆

11

In this question an array of statements is presented. Please indicate how much you agree with each statement. *

| | strongly disagree | disagree | neutral | agree | strongly agree |
|---|---|---|---|---|---|
| I learned something new because of this post. | ○ | ○ | ○ | ○ | ○ |
| This post has changed my opinion on plastic packaging. | ○ | ○ | ○ | ○ | ○ |
| I am willing to reduce the amount of plastic packaging I buy, because of this post. | ○ | ○ | ○ | ○ | ○ |
| I want to learn more about this topic, because of this post. | ○ | ○ | ○ | ○ | ○ |

## Digital Marketing - In-App Advertising

12

This is a fictional in-app advertisement. Please imagine this ad being shown at the checkout of a food deliver app (Mjam, Lieferando, Deliveroo, Uber Eats, GrubHub) before ordering.

Please rate the following post (Content/Information, Quality, Length, Attractiveness). *


☆ ☆ ☆ ☆ ☆

Left picture: © Image'in - stock.adobe.com, right picture: © Aleksej - stock.adobe.com

13

In this question an array of statements is presented. Please indicate how much you agree with each statement. *

| | strongly disagree | disagree | neutral | agree | strongly agree |
|---|---|---|---|---|---|
| I learned something new because of this post. | ○ | ○ | ○ | ○ | ○ |
| This post has changed my opinion on plastic packaging. | ○ | ○ | ○ | ○ | ○ |
| I am willing to reduce the amount of plastic packaging I buy, because of this post. | ○ | ○ | ○ | ○ | ○ |
| I want to learn more about this topic, because of this post. | ○ | ○ | ○ | ○ | ○ |

## Final Questions

In this section you will be asked about your opinion on digital marketing, your consumer behavior and your environmental awareness.

14

I consider digital advertisements as a serious and trustworthy form of advertising. (1 strongly agree - 5 strongly disagree) *

1 2 3 4 5

○ ○ ○ ○ ○

15

I have bought products or changed my behavior because of digital advertisements before. *

- ○ Yes
- ○ No

16

Which type of digital marketing do you think is the most relevant? *

- ○ Social Media (Instagram, Facebook, etc.)
- ○ Influencer (Social Media, Youtube, Blog, etc.)
- ○ In-App
- ○ Newsletter
- ○ Search Engine Advertisement
- ○ Video (Youtube, etc.)
- ○ Audio Advertisements (Spotify, etc.)

17

Typically I do my grocery shopping at a *

- ◯ Discounter (Aldi, Hofer, Lidl, Penny, Netto, Dia, Costco)
- ◯ Supermarket (Billa, Spar, Edeka, REWE, Konzum, Carrefour, Sainsbury's, Tesco)
- ◯ Organic grocery store (Denn's, Alnatura, Basic, Veritas, Naturéo, Whole Foods, Farmers' market)

18

When you go shopping and you buy at least 10 products, how many are typically packaged in plastic? *

- ◯ none
- ◯ 1-2
- ◯ 3-4
- ◯ 5
- ◯ > 5

19

In this question an array of statements is presented. Please indicate how much you agree with each statement. *

| | strongly disagree | disagree | neutral | agree | strongly agree |
|---|---|---|---|---|---|
| I know the term "sustainability" and its meaning. | ○ | ○ | ○ | ○ | ○ |
| I am aware that my lifestyle has an impact on the environment. | ○ | ○ | ○ | ○ | ○ |
| Sustainability is important for our society. | ○ | ○ | ○ | ○ | ○ |
| Society should focus on using more renewable resources in the production of goods. | ○ | ○ | ○ | ○ | ○ |
| I am willing to pay a higher price for products that are better for our environment. | ○ | ○ | ○ | ○ | ○ |
| I try to reduce the amount of products with plastic packaging that I buy. | ○ | ○ | ○ | ○ | ○ |

## Appendix 2: Online Survey in German

# Auswirkung von digitalem Marketing auf das Kaufverhalten

In dieser Umfrage geht es um den Effekt von digitaler Werbung auf das Kaufverhalten. Es werden drei verschiedene Arten der digitalen Werbung behandelt, Instagram Werbung, Facebook Werbung sowie Influencer Werbung. Die Ergebnisse dieser Umfrage werden im Rahmen einer Masterarbeit zu Digitalem Marketing und Konsumentenverhalten verarbeitet. Die Antworten sind völlig anonym und werden nur für statistische Zwecke verwendet.

Die Umfrage dauert ca. 8-10 Minuten.

Bereits jetzt vielen Dank für Ihre Teilnahme!

* Required

### Persönliche Daten

In diesem Teil werden Sie gebeten demographische Fragen zu Ihrer Person, jedoch völlig anonym, zu beantworten.

1

Geschlecht *

- ◯ männlich
- ◯ weiblich
- ◯ divers
- ◯ keine Antwort

2

Alter *

- ◯ 18-24
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55-64
- ◯ 65+

3

Höchster Bildungsabschluss *

- ◯ Pflichtschule (Hauptschule, Unterstufe, Mittelschule)
- ◯ Lehrabschluss
- ◯ Matura/Abitur
- ◯ Hochschule/Universität (Bachelor)
- ◯ Hochschule/Universität (Master, Mag., Dipl. Ing., etc.)
- ◯ Hochschule/Universität (Dr., PhD)

4

Einkommensklasse Netto *

- ◯ < 15.000€
- ◯ 15.001€ - 30.000€
- ◯ 30.001€ - 45.000€
- ◯ 45.001€ - 60.000€
- ◯ 60.001€ - 75.000€
- ◯ 75.001€ - 90.000€
- ◯ > 90.000€

5

Wohnort *

- ◯ Landgemeinde/Dorf/Markt
- ◯ Kleinstadt (5.000 - 10.000 Einwohner)
- ◯ Stadt (10.001 - 100.000 Einwohner)
- ◯ Großstadt (>100.000 Einwohner)

6

Bewerten Sie den folgenden Beitrag
(Inhalt/Informationsgehalt, Qualität, Länge, Ist der Beitrag ansprechend) *

*Link zum Beitrag: https://www.instagram.com/p/CISwSAUHJjA/ (https://www.instagram.com/p/CISwSAUHJjA/)*

*Übersetzung:*
*"Die 10 schlimmsten Plastik Umweltverschmutzer, Anzahl der Länder in denen Plastikmüll gefunden wurde sowie Stückzahl"*
*"Diese Firmen haben weltweit den meisten Plastikmüll verursacht der von Freiwilligen aufgesammelt werden musste..."*


☆ ☆ ☆ ☆ ☆

7

Nachfolgend finden Sie eine Reihe von Aussagen. Bitte geben Sie an wie weit Sie den Aussagen zustimmen bzw. nicht zustimmen. *

| | stimme überhaupt nicht zu | stimme weniger zu | weder noch | stimme eher zu | stimme voll zu |
|---|---|---|---|---|---|
| Aufgrund dieses Beitrags habe ich etwas Neues erfahren. | ○ | ○ | ○ | ○ | ○ |
| Dieser Beitrag hat etwas an meiner Meinung zu Plastiverpackungen geändert. | ○ | ○ | ○ | ○ | ○ |
| Ich bin bereit aufgrund dieser Werbung weniger Plastikverpackungen zu kaufen. | ○ | ○ | ○ | ○ | ○ |
| Ich möche mich aufgrund dieser Werbung mehr über dieses Thema informieren | ○ | ○ | ○ | ○ | ○ |

8

Bewerten Sie den folgenden Beitrag
(Inhalt/Informationsgehalt, Qualität, Länge, Ist der Beitrag ansprechend) *

*Es ist schon absurd: Mit herkömmlichem Putzmittel reinigen wir unsere Bude und hinterlassen dabei trotzdem Schmutz. Der ist zwar nicht sichtbar in unseren eigenen vier Wänden, aber dafür auf unserer Erde. Denn mit jeder leeren Putzmittel-Flasche aus Einwegplastik verschmutzen wir die Erde um eine weitere PET-Flasche, die nicht (vollständig) recycelbar ist.*

*Wusstest Du, dass ...*
*... in Deutschland stündlich 1,9 Millionen Einweg-Plastikflaschen verbraucht werden? Pro Tag sind das rund 45 Millionen Stück. Das bedeutet, dass im Schnitt jede*r Deutsche fast 200 Einweg-Plastikflaschen pro Jahr verbraucht!*

*Diese Zahlen können und müssen wir reduzieren! Wir verwenden unseren Coffee-2-Go-Becher immer wieder, kaufen Flüssigseife in Nachfüllpacks oder an Nachfüllstationen und sogar Duschgel gibt's mittlerweile fast überall in fester Form – warum also nicht auch Putzmittel?!*

*Wir sagen: Putzmittel darf die Umwelt NICHT verschmutzen!* ✕
*Deshalb haben wir Putzmittel-Tabs entwickelt, die nur die nötigsten Inhaltsstoffe enthalten und leicht biologisch abbaubar* sind – ohne dabei Abstriche bei der Reinigungskraft einzugehen. Auch bei unseren Flaschen aus 100% recyceltem PET (abgesehen vom Sprühkopf) haben wir darauf geachtet, dass sie mit so viel Liebe hochwertig und langlebig hergestellt sind, dass Du sie immer wieder verwenden kannst und möchtest.* 🤍

*Auch die Inhaltsstoffe vieler herkömmlicher Putzmittel enthalten giftige Substanzen, die durch das Abwasser in unsere Kläranlagen gelangen und dort nicht herauszufiltern sind. (Quelle: NDR) 🤓 Es lohnt sich also allemal, der Umwelt, der eigenen Gesundheit und teilweise sogar Deinem Geldbeutel zuliebe auf nachhaltige Reiniger wie unsere umzusteigen.* 😷

*Lasst uns gemeinsam die Welt ein bisschen sauberer machen.* 🚿🌍

*(https://www.facebook.com/everdrop.de/photos/a.140482190737244/340181357433992/*
*(https://www.facebook.com/everdrop.de/photos/a.140482190737244/340181357433992/))*


☆ ☆ ☆ ☆ ☆

9

Nachfolgend finden Sie eine Reihe von Aussagen. Bitte geben Sie an wie weit Sie den Aussagen zustimmen bzw. nicht zustimmen. *

| | stimme überhaupt nicht zu | stimme weniger zu | weder noch | stimme eher zu | stimme voll zu |
|---|---|---|---|---|---|
| Aufgrund dieses Beitrags habe ich etwas Neues erfahren. | ○ | ○ | ○ | ○ | ○ |
| Dieser Beitrag hat etwas an meiner Meinung zu Plastiverpackungen geändert. | ○ | ○ | ○ | ○ | ○ |
| Ich bin bereit aufgrund dieser Werbung weniger Plastikverpackungen zu kaufen. | ○ | ○ | ○ | ○ | ○ |
| Ich möche mich aufgrund dieser Werbung mehr über dieses Thema informieren | ○ | ○ | ○ | ○ | ○ |

10

Bewerten Sie den folgenden Beitrag
(Inhalt/Informationsgehalt, Qualität, Länge, Ist der Beitrag ansprechend) *

*Link zum Beitrag: https://www.instagram.com/p/BzQmbLBn5gE/ (https://www.instagram.com/p/BzQmbLBn5gE/)*
*Übersetzung:*
*"Wieder ein entspannender Tag an unserem schönen Strand. Ist es nicht unglaublich, dass unsere Strände in Zukunft wirklich so aussehen könnten, wenn wir nicht die Menge an Single-Use Plastik reduzieren? Wussten Sie, dass der Taucher der den tiefsten Tauchgang absolvierte, dort Plastikmüll gefunden hat? Sogar der Marianengraben ist nicht frei von Plastikmüll. Ich will, dass meine Kinder und Ihre Kinder durch unsere Seen und Meere ohne Plastikmüll schwimmen können. Ich bete, dass wir eine bleibende Veränderung bewirken können, damit unsere Kinder nicht in einer durch Müll dauerhaft verschmutzen Welt leben müssen."*


☆ ☆ ☆ ☆ ☆

Left picture: © Image'in - stock.adobe.com, right picture: © Aleksej - stock.adobe.com

11

Nachfolgend finden Sie eine Reihe von Aussagen. Bitte geben Sie an wie weit Sie den Aussagen zustimmen bzw. nicht zustimmen. *

| | stimme überhaupt nicht zu | stimme weniger zu | weder noch | stimme eher zu | stimme voll zu |
|---|---|---|---|---|---|
| Aufgrund dieses Beitrags habe ich etwas Neues erfahren. | ○ | ○ | ○ | ○ | ○ |
| Dieser Beitrag hat etwas an meiner Meinung zu Plastiverpackungen geändert. | ○ | ○ | ○ | ○ | ○ |
| Ich bin bereit aufgrund dieser Werbung weniger Plastikverpackungen zu kaufen. | ○ | ○ | ○ | ○ | ○ |
| Ich möche mich aufgrund dieser Werbung mehr über dieses Thema informieren | ○ | ○ | ○ | ○ | ○ |

## Digitales Marketing - In-App Advertising

12

Dies ist ein fiktiver Beitrag. Stellen Sie sich vor, dass einer dieser Beiträge am Ende einer Essensbestellung in einer App (z.B. Mjam, Lieferando, Deliveroo, etc.) angezeigt wird.

Bewerten Sie den folgenden Beitrag
(Inhalt/Informationsgehalt, Qualität, Länge, Ist der Beitrag ansprechend) *

*Übersetzung:*
*1 - "Hilf uns den Planeten zu retten! 🌎 Für nur 1€ Aufpreis liefern wir ohne Plastikverpackung"*
*2 - "Ja ich will den Planeten retten"*
*3 - "Bestellung mit Standardverpackung"*


☆ ☆ ☆ ☆ ☆

13

Nachfolgend finden Sie eine Reihe von Aussagen. Bitte geben Sie an wie weit Sie den Aussagen zustimmen bzw. nicht zustimmen. *

| | stimme überhaupt nicht zu | stimme weniger zu | weder noch | stimme eher zu | stimme voll zu |
|---|---|---|---|---|---|
| Aufgrund dieses Beitrags habe ich etwas Neues erfahren. | ○ | ○ | ○ | ○ | ○ |
| Dieser Beitrag hat etwas an meiner Meinung zu Plastiverpackungen geändert. | ○ | ○ | ○ | ○ | ○ |
| Ich bin bereit aufgrund dieser Werbung weniger Plastikverpackungen zu kaufen. | ○ | ○ | ○ | ○ | ○ |
| Ich möche mich aufgrund dieser Werbung mehr über dieses Thema informieren | ○ | ○ | ○ | ○ | ○ |

## Abschlussfragen

In diesem Abschnitt werden Sie zur Ihrer Meinung zu digitaler Werbung, Ihrem Einkaufsverhalten und Umweltbewusstsein befragt.

14

Digitale Werbung stellt für mich seriöse und ernstzunehmende Werbung dar.
(1 stimme vollkommen zu - 5 stimme überhaupt nicht zu) *

1 2 3 4 5

○ ○ ○ ○ ○

15

Ich habe aufgrund von digitaler Werbung schon etwas gekauft oder mich anders verhalten. *

- ○ Ja
- ○ Nein

16

Welche Art digitaler Werbung ist Ihrer Meinung nach am relevantesten? *

- ○ Social Media (Instagram, Facebook, etc.)
- ○ Influencer (Social Media, Youtube, Blog, etc.)
- ○ In-App
- ○ Newsletter
- ○ Suchmaschinenwerbung
- ○ Video (Youtube, etc.)
- ○ Audiowerbung (Spotify, etc.)

17

Typischer Einkauf bei *

- ◯ Diskonter (Aldi, Hofer, Lidl, Penny, Netto, Dia, Costco)
- ◯ Supermarkt (Billa, Spar, Edeka, REWE, Konzum, Carrefour, Sainsbury's, Tesco)
- ◯ Biomarkt (Denn's, Alnatura, Basic, Veritas, Naturéo, Whole Foods, Marktplatz)

18

Wenn Sie einen Einkauf von zumindest 10 Artikeln tätigen, wieviel Produkte sind davon für gewöhnlich in Plastik verpackt? *

- ◯ keine
- ◯ 1-2
- ◯ 3-4
- ◯ 5
- ◯ > 5

19

Nachfolgend finden Sie eine Reihe von Aussagen. Bitte geben Sie an wie weit Sie den Aussagen zustimmen bzw. nicht zustimmen. *

| | stimme überhaupt nicht zu | stimme weniger zu | weder noch | stimme eher zu | stimme voll zu |
|---|---|---|---|---|---|
| Der Begriff Nachhaltigkeit ist mir bekannt und mir ist die Bedeutung bewusst. | ○ | ○ | ○ | ○ | ○ |
| Mir ist bewusst, dass sich meine Lebensweise auf die Umwelt auswirkt. | ○ | ○ | ○ | ○ | ○ |
| Nachhaltigkeit ist wichtig für die Gesellschaft | ○ | ○ | ○ | ○ | ○ |
| Die Gesellschaft sollte einen Wechsel zu nachwachsenden Rohstoffen in der Produktion forcieren. | ○ | ○ | ○ | ○ | ○ |
| Ich bin bereit einen höheren Preis für Produkte, die besser für die Umwelt sind, zu zahlen. | ○ | ○ | ○ | ○ | ○ |
| Ich achte darauf weniger Produkte in Plastikverpackung zu kaufen. | ○ | ○ | ○ | ○ | ○ |

# Appendix 3 – Additional material from SPSS

## Mean rank description of Table 25.

a. Facebook_Willingness_to_reduce < Instagram_Willingness_to_reduce
b. Facebook_Willingness_to_reduce > Instagram_Willingness_to_reduce
c. Facebook_Willingness_to_reduce = Instagram_Willingness_to_reduce
d. Influencer_Willingness_to_reduce < Instagram_Willingness_to_reduce
e. Influencer_Willingness_to_reduce > Instagram_Willingness_to_reduce
f. Influencer_Willingness_to_reduce = Instagram_Willingness_to_reduce
g. In_App_Willingness_to_reduce < Instagram_Willingness_to_reduce
h. In_App_Willingness_to_reduce > Instagram_Willingness_to_reduce
i. In_App_Willingness_to_reduce = Instagram_Willingness_to_reduce
j. Influencer_Willingness_to_reduce < Facebook_Willingness_to_reduce
k. Influencer_Willingness_to_reduce > Facebook_Willingness_to_reduce
l. Influencer_Willingness_to_reduce = Facebook_Willingness_to_reduce
m. In_App_Willingness_to_reduce < Facebook_Willingness_to_reduce
n. In_App_Willingness_to_reduce > Facebook_Willingness_to_reduce
o. In_App_Willingness_to_reduce = Facebook_Willingness_to_reduce
p. In_App_Willingness_to_reduce < Influencer_Willingness_to_reduce
q. In_App_Willingness_to_reduce > Influencer_Willingness_to_reduce
r. In_App_Willingness_to_reduce = Influencer_Willingness_to_reduce