

# **Factors Influencing Purchase Intention for Recycled Products**

A Comparative Analysis of Germany and South Africa

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## **Abstract**

### Factors Influencing Purchase Intention for Recycled Products

The alarming degradation of the natural environment is leading many consumers to increasingly demand sustainable products. Since 2017, the global purchase intention of such products has increased by 63%. To respond to the increasing demand, more and more companies have started producing products from sustainable materials such as recycled products. However, purchase intention does not always result in actual behavior and can vary due to different products and in country-specific contexts. Hence, it is the purpose of this study to determine which factors influence the purchase intention of recycled products and whether these factors differ between a developed country such as Germany and a developing country such as South Africa. Furthermore, the study aims to discover whether there are differences in purchase intention with regard to different product categories, whether there is an intention-behavior gap, and whether there are country-specific differences. Finally, target groups of the corresponding countries will be derived. To answer the research questions, a quantitative study was conducted using an online questionnaire in Germany ( $n = 603$ ) and South Africa ( $n = 692$ ). The findings demonstrate that the purchase intention for recycled products is significantly higher in South Africa than in Germany, but no significant difference in the factors influencing the purchase intention could be found. However, the factors differ in terms of the extent of their influence. Thus, the factor "Attitude / Environmental Concern" has the strongest influence in South Africa, while the factor "Value / Accessibility" has the strongest influence in Germany. Likewise, a difference could be found concerning the products, with the purchase intention for mobile phones generally smaller than for t-shirts and toilet paper. In a country-specific comparison, however, purchase intention for t-shirts is significantly higher in South Africa than in Germany. An intention-behavior gap was identified for the sample, and it was found that the age groups 25 to 49 have the strongest purchase intentions and that the purchase intention increases significantly with increasing education level.

Keywords: sustainable development; circular economy; recycling; purchase intention; recycled products; influencing factors; intention-behavior gap; country-specific differences

## Kurzreferat

### Einflussfaktoren auf die Kaufabsicht von Recyclingprodukten

Die besorgnisrechte Entwicklung unserer Umwelt führt dazu, dass Konsumenten vermehrt nach nachhaltigen Produkten nachfragen. Die globale Kaufabsicht solcher Produkte hat in den vergangenen fünf Jahren um 63% zugenommen. Um auf die steigende Nachfrage zu reagieren, haben immer mehr Unternehmen damit begonnen, Produkte aus nachhaltigen Materialien wie beispielsweise Recyclingprodukte zu produzieren. Doch nicht immer resultiert eine Kaufabsicht auch in tatsächliches Verhalten und kann aufgrund unterschiedlicher Produkte sowie im länderspezifischen Kontext variieren. Entsprechend ist es das Ziel der vorliegenden Studie herauszufinden, welche Faktoren die Kaufabsicht von Recyclingprodukten beeinflussen, und ob sich diese Faktoren zwischen den Ländern Deutschland als entwickeltes Land und Südafrika als Entwicklungsland unterscheiden. Zudem ist es Ziel der vorliegenden Studie herauszufinden, ob es Unterschiede der Kaufabsicht im Hinblick auf unterschiedliche Produktkategorien gibt, sowie ob eine Intentions-Verhaltens-Lücke existiert und ob länderspezifische Unterschiede existieren. Abschließend sollen Zielgruppen der entsprechenden Länder abgeleitet werden. Zur Beantwortung der Forschungsfragen wurde eine quantitative Studie anhand eines Online-Fragebogens in Deutschland ( $n = 603$ ) und Südafrika ( $n = 692$ ) durchgeführt. Die Ergebnisse zeigen, dass die Kaufabsicht für Recyclingprodukte in Südafrika signifikant größer ist als in Deutschland, jedoch kein signifikanter Unterschied der Einflussfaktoren auf die Kaufabsicht festgestellt werden konnte. Allerdings unterscheiden sich die Faktoren im Hinblick ihres Einflusses. So nimmt der Faktor „Einstellung / Umweltbedenken“ den größten Einfluss in Südafrika, während der Faktor „Wert / Zugang“ den größten Einfluss in Deutschland nimmt. Ebenso konnte ein Unterschied im Hinblick der Produkte festgestellt werden. So ist die Kaufabsicht für Mobiltelefone generell kleiner als für T-Shirts und Toilettenpapier. Im länderspezifischen Vergleich hingegen ist die Kaufabsicht für T-Shirts in Südafrika signifikant größer als in Deutschland. Eine Intentions-Verhaltens-Lücke konnte für die Stichprobe festgestellt werden und es konnte herausgefunden werden, dass die Altersgruppen der 25 bis 49-jährigen die stärksten Kaufabsichten haben und die Kaufabsicht mit steigendem Bildungslevel signifikant zunimmt.

Stichwörter: Nachhaltige Entwicklung; Kreislaufwirtschaft; Recycling; Kaufabsicht; Recyclingprodukte; Einflussfaktoren; Intention-Verhaltens-Lücke; länderspezifische Unterschiede

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## List of Abbreviations

AT	Attitude
C	Certification
CE	Circular Economy
CR	Context-related
D	Distribution
DV	Dependent Variable(s)
EC	Environmental Concern
FMCG	Fast Moving Consumer Goods
GDP	Gross Domestic Product
IR	Individual-related
KMO	Kaiser-Meyer Olking
LSM	Living Standards Measure
P	Price (or product)
PB	Purchase Behavior
PBC	Perceived Behavioral Control
PCE	Perceived Consumer Effectiveness
PI	Purchase Intention
PR	Product-related (or perceived risk)
PV	Perceived Value
QF	Quality and Functionalities
SDG	Sustainable Development Goals
SEM	Socio-Economic Measure
SN	Subjective Norm
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action

"We must transform every element of our take-make-waste system: how we manage resources, how we make and use products, and what we do with the materials afterwards. Only then can we create a thriving circular economy that can benefit everyone within the limits of our planet." (Ellen MacArthur Foundation n. y.)

# **1 Introduction**

This chapter describes the background of the present research. The research gaps and objectives are then described, and the research questions and methodology are briefly explained. Finally, the structure of the thesis is discussed.

## **1.1 Background**

Lower mortality rates, longer life expectancies, and higher fertility rates are the main reasons why the global population has more than tripled since 1950. Although the population growth has decelerated recently, the rise is projected to continue until the end of the 21<sup>st</sup> century. While social and economic changes have lifted many people out of poverty (United Nations 2021, p. 5), they have done so at the expense of the environment. Growing demand has inevitably led to the depletion of resources and environmental pollution (United Nations 2021, p. 96 f). The global population is predicted to increase by 20% or 30% in 2050 compared to 2020 (United Nations 2021, p. 3). We are thus faced with the challenge of securing supplies for future generations by managing and restoring vital resources (OECD 2012, p. 19).

To ensure development that meets people's needs without harming future generations, the concept of sustainable development was introduced (United Nations 1987, chapter 3, para. 1). In 2015, the United Nations presented "17 sustainable development goals", including various actions such as to stop global poverty and hunger by 2030. Goal number 12 explicitly deals with sustainable consumption and production. The reduction of humanity's ecological footprint through the maximum conservation of resources and the use of recycling or waste reduction is emphasized (United Nations Development Programme n. y.). According to the United Nations, companies' wasteful production processes and consumption are the primary causes of environmental pollution, global warming, and biodiversity loss (Balderjahn 2021, ch. 3.1.2, para. 1).

One way of moving toward sustainable development is through the concept of the circular economy (Ellen MacArthur Foundation n. y.). The concept provides a guide for sustainable development (Murray; Skene; Haynes 2017, p. 369) and aims to create a balance between humans and the environment (Ghisellini; Cialani; Ulgiati 2015, p. 11) by gradually moving away from the linear and wasteful make-take-dispose economy (Ellen MacArthur Foundation 2013, p. 6).

Existing literature on the circular economy often refers to the '3Rs' reduce, reuse, and recycle (e.g. Kirchherr; Reike; Hekkert 2017, p. 229; Ghisellini; Cialani; Ulgiati 2015, p. 15; Grafström; Aasma 2021, p. 2). Recycling is the most commonly applied of the 3Rs (Ghisellini; Cialani; Ulgiati 2015, p. 11) which is the process of dismantling a used product and transforming its parts into new products or raw materials (Pearce 2009). In recent years, renowned companies, such as Apple, H&M, and Adidas, have implemented recycling programs in which they collect used products or manufacture sustainable items, such as products made from recycled materials (Lv; Liu; Cheng 2021, p. 2; Meng; Leary 2019, p. 1).

The transformation to a sustainable circular economy requires a shift in traditional business models and consumer acceptance of sustainable products (Queiroz et al. 2021, p. 1).

Increasing concern about the environment has led humans to seek more sustainable solutions. As a result, the demand for sustainable products has increased in recent years. This trend has eventually led companies to pay more attention to producing and marketing sustainable products (Zhang; Dong 2020, p. 1 after Sheng et al. 2018).

To manage the transformation to a circular economy, consumers must accept sustainable goods such as recycled products and be willing to buy them (Calvo-Porral; Lévy-Mangin 2020, p. 1). It is therefore important to discover which factors influence the purchase intention for recycled products to derive appropriate marketing strategies.

## 1.2 Research Gaps and Objectives

Due to the negative developments in our environment, increasing numbers of people have started to demand sustainable products (Kumar; Prakash; Kumar 2021, p. 1). Within the last five years, the intention to buy sustainable products increased globally by 63% (Simon + Kucher & Partners 2021, p. 4). Numerous studies have been conducted in recent years to determine which factors influence purchase intentions for sustainable products (e.g. Nekmahmud; Fekete-Farkas 2020, p. 1; Testa et al. 2021, p. 4826). Although recycled goods can be considered sustainable products (e.g. Biswas 2016, p. 211; Mohd Suki 2015, p. 292), little is known about the factors that influence purchase intentions regarding these in a narrower sense (Calvo-Porral; Lévy-Mangin 2020, p. 1; Bigliardi et al. 2020, p. 1). The few studies concerning recycled products only consider specific factors (Queiroz et al. 2021, p. 8; Calvo-Porral; Lévy-Mangin 2020, p. 7). Hence, the literature is scarce and fragmented (Bigliardi et al. 2020, p. 1). Bigliardi et al. (2020, p. 20) took this fact as a starting point by developing a theoretical framework that divided the different factors that can influence the purchase intention for recycled products into three blocks (consisting of several individual-, context- and product-related constructs). The authors recommend that future studies should consider factors from all three blocks to gain a holistic picture. Thus, one objective of this paper is to discover the factors that influence purchase intentions for recycled products. To get a holistic picture, theoretical framework provided by Bigliardi et al. serves as a guideline.

Although intentions to buy sustainable products have generally increased, it does not necessarily mean that consumers buy such products (e.g. Jung; Choi; Oh 2020, p. 1; Groening; Sarkis; Zhu 2018, p. 1848). This tendency also applies to recycled products, which are often said to be of poor quality (Queiroz et al. 2021, p. 1) or even repulsive (Meng; Leary 2019, p. 1). In this context, reference is often made to the so-called intention-behavior gap (e.g. ElHaffar; Durif; Dubé 2020, p. 1; Nguyen; Nguyen; Hoang 2018, p. 1; Frank; Brock 2018, p. 1), which means that consumers' purchase intention differs from their actual purchase behavior (ElHaffar; Durif; Dubé 2020, p. 14). For example, a study from 2000 showed that only 28% of consumers who stated that they intended to buy sustainable products actually bought them (Sheeran 2002, p. 29). This was examined again 16 years later, when half of those with an intention to buy actually did so (Sheeran; Webb 2016, p. 511). According to ElHaffar et al. (2020, p. 13), this intention-behavior gap should be studied regularly, as rapid social changes can influence it. Hence, another objective of this paper is to find out whether such a gap exists with regard to recycled products.

Another point to consider are different product types. Previous publications have focused mainly on apparel (e.g. Chi et al. 2021; Chaturvedi; Kulshreshtha; Tripathi 2020; Wagner; Heinzel 2020), plastic products, or apparel made from recycled plastic (e.g. Queiroz et al. 2021; Luu; Baker 2021; Nguyen; Nguyen; Hoang 2018; Meng; Leary 2019). However, further studies have found that there may be a difference in purchase intentions concerning different product types (Magnier; Mugge; Schoormans 2019, p. 1). Hence, another objective of this study is to determine the influence of different product types on purchase intentions for recycled products. This aim is underpinned by the fact that past publications have also requested further exploration of this area (e.g. Bigliardi et al. 2020, p. 13; Agostini et al. 2021, p. 9; Ta; Aarikka-Stenroos; Litovuo 2022, p. 16).

Finally, the need to examine cultural or country-specific differences should be highlighted (Agostini et al. 2021, p. 9; Bigliardi et al. 2020, p. 13; Ta; Aarikka-Stenroos; Litovuo 2022, p. 16). The existing literature usually refers to single countries such as Brazil (Queiroz et al. 2021), Vietnam (Luu; Baker 2021; Nguyen; Nguyen; Hoang 2018), the USA (Bae 2021; Meng; Leary 2019), India (Chaturvedi; Kulshreshtha; Tripathi 2020), Spain (Calvo-Porral; Lévy-Margin 2020), the Netherlands (Magnier; Mugge; Schoormans 2019), or Canada (Hamzaoui Essoussi; Linton 2010). However, Queiroz et al. (2021, p. 1) suggested that purchase intentions might differ due to various economic, social, and psychosocial factors. Differences could exist with regard to whether countries are developed or developing (Luu; Baker 2021, p. 1). Developing countries are generally slower than developed ones in embracing the concept of the circular economy (Ngang et al. 2019, p. 314). This trend makes the comparison of a developed country like Germany and a developing country like South Africa of particular significance. For this reason, another goal of this study is to ascertain how the results differ with regard to the two countries. Subsequently, target groups in the two countries will be defined.

In summary, the objectives of the present study are as follows:

- To identify the factors influencing the purchase intention for recycled products and whether there is a difference between Germany and South Africa.
- To identify whether purchase intention differs regarding different product types and whether there is a difference between Germany and South Africa.
- To identify whether an intention-behavior gap exists regarding purchase intention and whether there is a difference between Germany and South Africa.
- To identify target groups for both countries.

The insights gained from the study are important from the perspective of theoretical advancement and relevant to managers interested in developing strategies for the introduction of recycled products in developed and developing countries.

### **1.3 Research Questions and Methodology**

Based on the previous chapter, which includes the research gaps and research objectives, a research question (RQ) and corresponding research sub-questions (SQ) were derived as follows:

- RQ** What factors influence the purchase intention for recycled products, and how do they differ between Germany and South Africa?
- SQ1** How does purchase intention differ with regard to different product types, and does it differ between Germany and South Africa?
- SQ2** Is there an intention-behavior gap regarding recycled products in Germany and South Africa?
- SQ3** Which target groups can be identified in Germany and South Africa?

A deductive research approach is used to answer the research question and subquestions. In this approach, hypotheses are derived based on existing theories, which are then tested (Saunders; Lewis; Thornhill 2009, p. 125).

A systematic literature search is conducted to describe the current state of research and the theoretical background of this study's subject. Search terms relevant to the topic are determined, and subsequently searched for in online databases such as Google Scholar, Web of Science and Scopus. Boolean logic terms are also used for the search, allowing search terms to be restricted, combined, or expanded by the use of link terms (Saunders; Lewis; Thornhill 2009, p. 83).

Furthermore, a quantitative study is conducted via an online questionnaire sent to South African and German samples. More detailed information regarding the research methodology of the empirical part of this study can be found in section 3.1 Research Model and Design.

## 1.4 Structure of the Thesis

This paper is divided into five chapters, including these introductory sections.

Chapter 2 (Theoretical Foundation) provides a more detailed introduction to the topic of purchase intentions for recycled products. For this purpose, definitions of the terms sustainable development and circular economy are presented. Subsequently, recycling as a sub-area of the circular economy is discussed. This section is followed by country-specific insights before the topic of purchase intentions is addressed. A large part of the second chapter deals with influencing factors or the identification of such. This is also where the hypothesis development begins. This section is followed by the identification of product types and a brief explanation of the intention-behavior gap and country-specific differences.

After the theoretical foundations have been laid and hypotheses derived, Chapter 3 (Methodology) explains the research model and design in detail. This section is followed by the operationalization of the constructs and an explanation of the sample design. Afterwards, the questionnaire is discussed in more detail, before the collected data is then analyzed.

Chapter 4 (Results) presents the results of the quantitative research. The sample is described, which is followed by a section containing descriptive statistics before the hypotheses are tested using appropriate methods.

In chapter 5 (Discussion and Implication), the results are discussed chronologically according to the research questions, and practical implications are provided.

Finally, chapter 6 (Limitations) discusses the limitations of the present study.

## 2 Theoretical Foundation

This chapter offers a uniform understanding of sustainable development and the circular economy, with a focus on recycling and recycled products. It also includes a definition of the term "purchase intention" and introduces the core topic of this research, namely the purchase intention for recycled products. The factors influencing the purchase intention are then identified, and hypotheses are derived. In the final sections, the different product types are defined, differences in purchase intention and actual behavior are discussed, and country-specific differences are explained, for which hypotheses are also derived.

### 2.1 Sustainable Development

This section is about sustainable development and provides a brief history, a definition of the term, and a discussion of the sustainable development goals (SDGs), with a focus on goal number 12.

#### 2.1.1 History and Definition of Sustainable Development

The concept of sustainability originated in the 1980s. The concept focuses on the development of the environment, but specifically on the consumption of natural resources. Its primary goal is to balance the environment and the economy without harming people or the planet. Sustainability is based on the assumption that resources cannot be depleted indefinitely (Portney 2015, p. 4).

The term is often used to refer to the '3Es' environment, economy, and equity. By this, it is understood that sustainability can only be achieved if the environment is protected, while ensuring economic growth and equity. A balance of all three concepts should be established, and none should be promoted at the expense of another. In the long run, there must be a trade-off between economic growth, environmental protection, and equity (Portney 2015, p. 6 f).

In this context, reference is made to the concept of sustainable development, first introduced in the 1987 report "Our Common Future", also known as the Brundtland Report (Balderjahn 2021, p. 1.1.1, para. 3). The United Nations' World Commission on Environment and Development defined the concept of sustainable development as follows:

*"Sustainable development requires meeting the basic needs of all and extending to all the opportunity to fulfill their aspirations for a better life."*

According to this definition, sustainable development should meet the needs of people in a way that does not harm future generations (United Nations 1987, p. 3, para. 1).

#### 2.1.2 Sustainable Development Goals

In 2015, the United Nations presented the 17 SDGs. Actions were presented to stop poverty and hunger by 2030, for example, and protect life on the planet. Goal number 12 explicitly pursues the goal of sustainable consumption and production. The reduction of humanity's

ecological footprint through the maximum conservation of resources and the use of recycling or waste reduction is particularly emphasized (United Nations Development Programme n. y.).



Figure 1: Overview of all 17 Sustainable Development Goals

Source: United Nations (n. y.)

According to the United Nations, company's wasteful production processes and consumption are the main causes of environmental pollution, global warming, and the loss of biodiversity (Balderjahn 2021, p. 3.1.2, para. 1).

The SDGs and the circular economy are interrelated. Ultimately, the circular economy contributes to the achievement of some of the 17 goals, and it directly helps achieve goal number 12 (Ghosh 2020, p. 8).

## 2.2 Circular Economy

In this section, the history and origins of the circular economy (CE) concept are discussed, and a definition of the term is provided. This is followed by an explanation of the principles of the circular economy or the principles of the 3Rs (reduce-reuse-recycle).

### 2.2.1 History and Definition of Circular Economy

Challenges such as climate change, biodiversity loss, waste, and pollution can be addressed with the concept of the circular economy (Ellen MacArthur Foundation n. y.). The concept is considered a guideline for implementing sustainable development (Murray; Skene; Haynes 2017, p. 369) and aims to create harmony between the economy, the environment and humanity by using resources as efficiently as possible (Ghisellini; Cialani; Ulgiati 2015, p. 11).

Although the origins of the concept date back to the 1960s (Boulding 1966, p. 27), it did not attract global attention until after the publication of the first Ellen MacArthur Foundation Report

in 2012<sup>1</sup> (Kirchherr; van Santen 2019, p. 1). The concept differs from today's predominant linear economy (Münger 2021, p. 27). The linear economy, often called the "take-make-dispose" economy (Ellen MacArthur Foundation 2013, p. 6), uses resources to produce and distribute goods that are consumed and ultimately end up in landfills. In contrast, CE seeks to ensure efficient consumption of resources, materials, and products (Münger 2021, p. 29).



Figure 2: The Concept of Circular Economy  
Source: Repak (n. y.)

As mentioned previously, the CE concept originated almost 60 years ago, when Kenneth Boulding (1966, p. 27 ff) first claimed that limited resources would sooner or later threaten humanity. He called the linear economy a "cowboy economy" and described our Earth metaphorically as a spaceship with limited resources, giving it the title "spaceman economy". Boulding argued that humanity must move away from the wasteful "cowboy economy" to the "space-man economy", where resources would be in closed cycles to ensure a sustainable life on the planet. Building on these ideas, environmental economists Pearce and Turner (1990, p. 29) were the first to speak of CE more specifically.

In 1970, the report "The Limits to Growth" caused a sensation (Münger 2021, p. 21). Researchers from the Massachusetts Institute of Technology (MIT) identified five factors that will limit growth on our planet: population growth, agricultural and industrial production, depletion of natural resources, and the rising pollution levels (Meadows et al. 1972, p. 11 f). The researchers concluded that if the growth trend of these factors continues, growth will reach its limit within the next 100 years (Meadows et al. 1972, p. 23 f). Although the work attracted much attention and was harshly criticized (Münger 2021, p. 21), some of its predictions have since been confirmed.

This fact can be demonstrated using the Earth Overshoot Day<sup>2</sup> model as an example. Whereas in 1970 our resources lasted until December 30, they would only last until July 29 in

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<sup>1</sup> Since 2012, more than 2700 articles have been published on CE, with 750 articles in 2019 alone. (as of 2019) (Kirchherr; van Santen 2019, p. 1)

<sup>2</sup> Earth Overshoot Day indicates the day in a year when humanity has used up all the ecological resources that our planet can regenerate and provide within a year (Earth Overshoot Day 2022a).

2021<sup>3</sup>. This means that our resource consumption would theoretically have to be covered by 1.7 planets (Earth Overshoot Day 2022c). Should our behavior remain unchanged, we would even need three planets in 2050 to sustainably cover our demand for resources (European Parliament 2022).

The existing literature often criticizes the lack of a uniform definition of CE (Grafström; Aasma 2021, p. 2; del Río et al. 2021, p. 32). For example, Kirchherr et al. (2017, p. 221) identified 114 definitions for CE. Efforts have been made to derive a unified definition based on previous publications (e.g. Geissdoerfer et al. 2017, p. 759; Kirchherr; Reike; Hekkert 2017, p. 229; Prieto-Sandoval; Jaca; Ormazabal 2018, p. 613). However, the definition identified as the one most cited in previous publications<sup>4</sup> (Queiroz et al. 2021, p. 4) is by Gisellini et al. (2018, p. 618) where CE “[...] promotes the maximum reuse/recycling of materials, goods and components in order to decrease waste generation to the largest possible extent.” The second most frequently cited definition (Queiroz et al. 2021, p. 4) comes from Geissdoerfer et al. (2017, p. 759), who defined the concept more precisely as

*“a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing and recycling.”*

## 2.2.2 The Principles of Circular Economy

In connection with the concept of CE, one often encounters the ‘3Rs’ reduce, reuse, and recycle (e.g. Kirchherr; Reike; Hekkert 2017, p. 229; Ghisellini; Cialani; Ulgiati 2015, p. 15; Grafström; Aasma 2021, p. 2). Some authors expand the concept with further terms, resulting in 7Rs (Münger 2021, p. 40) or 9 or 10Rs (del Río et al. 2021, p. 185). The 3Rs originally formed the core of the CE Promotion Laws in China published in 2008 and are now mostly used to explain CE implementation (Kirchherr; Reike; Hekkert 2017, p. 229).

As the name suggests, *reduce* is about minimizing the use of resources. This reduction can be achieved, for example, by introducing efficiency-enhancing measures in production (Ghisellini; Cialani; Ulgiati 2015, p. 15). For example, scrap from plastic production can be re-integrated into the production process instead of being thrown away (Münger 2021, p. 41).

*Reuse* refers to the reusing products that have not yet been completely discarded. The products are reprocessed to serve the same purpose again (Ghisellini; Cialani; Ulgiati 2015, p. 15). Reusable bottles serve as an example of this (Münger 2021, p. 41).

*Recycle* is about extracting materials that would otherwise end up in the landfill. The recycled materials are subsequently transformed into new products (Ghisellini; Cialani; Ulgiati 2015, p. 15).

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<sup>3</sup> Earth Overshoot Day varies by country and in 2022 already was on May 4 in Germany and June 1 in South Africa (Earth Overshoot Day 2022b). An overview of all countries can be found in Appendix A.

<sup>4</sup> Based on all definitions/citations until April 2021 that could be identified in the Scopus database (Queiroz et al. 2021, p. 4).

As the central topic of the present research is recycled products, the topic of recycling is explained more explicitly in the following section.

## 2.3 Recycling

The purpose of this section is first to provide a history and definition of recycling as part of the circular economy. This description is followed by a definition of the term “recycled products”.

### 2.3.1 History and Definition of Recycling

Recycling is a concept that is almost as old as humankind itself (Schäfer 2021, p. 2). In pre-history, humans reused their worn tools and flints for other purposes instead of discarding them (Shimelmitz 2015, p. 34). In the late Middle Ages, people actively recycled many items, notably scrap metals. However, by the beginning of the 20<sup>th</sup> century, human thriftiness, which had once been a commonly observed virtue, gradually began to disappear. Humanity was confronted with an increasing variety of products and adapted its purchasing behavior accordingly. Hence, thriftiness has decreased more and more during the last few decades while people adopted a culture of mass consumption (Oldenziel; Weber 2013, p. 349).

As an integral part of CE, the topic of recycling has also gained importance again in recent years and is frequently addressed and politically pushed (Schäfer 2021, p. 1). The frequency with which both topics have been discussed is displayed in the following graph, which shows the number of publications.

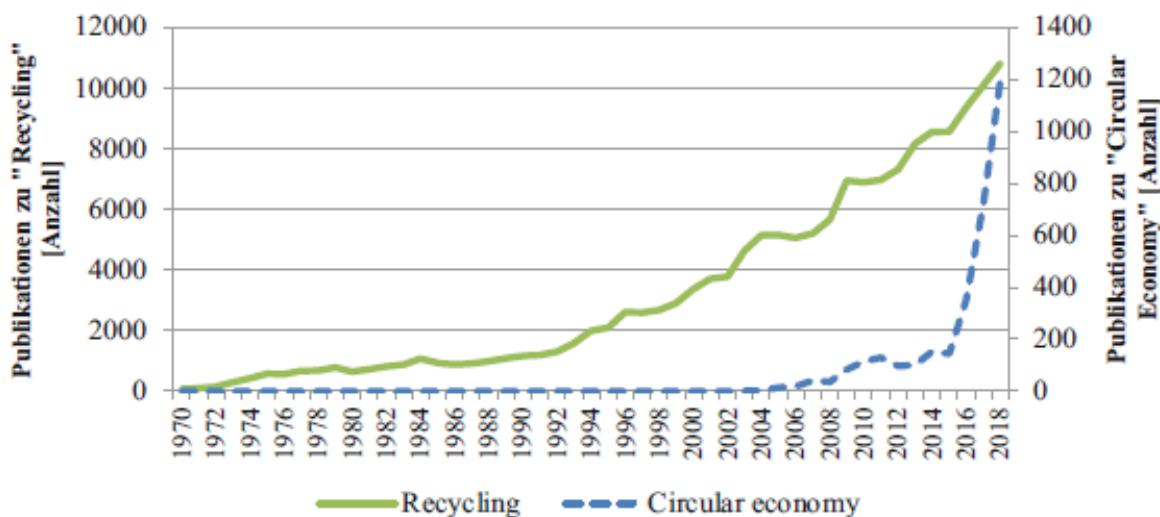


Figure 3: Number of Publications of Recycling (left) and Circular Economy (right)  
Source: Schäfer (2021, p. 5)

Nevertheless, the global economy is still a long way from implementing the CE. Recycling is the most common of the 3R approaches (Ghisellini; Cialani; Ulgiati 2015, p. 11), despite being less environmentally friendly than reducing or reusing (Stahel 2014). However, recycling is a better alternative than throwing products away (Münger 2021, p. 44) since it significantly reduces waste and the demand for natural resources, which in turn leads to a reduction in pollution (EPA n. y.).

According to Pearce (2009), recycling is defined as follows:

*„Recycling is the process by which a used product is broken down into consistent parts, which are converted into different products or used as raw material.“*

Numerous materials such as glass, aluminum, paper, and rubber can be recycled (Pearce 2009). Companies can help conserve resources by integrating recycled materials into their production processes. For this reason, companies such as Apple, H&M, and Adidas, have recently been manufacturing products from recycled materials (Lv; Liu; Cheng 2021, p. 2; Meng; Leary 2019, p. 1).

### **2.3.2 Definition of Recycled Products**

Recycled products are items made from materials that have been recycled and transformed into new products (Pearce 2009, p. 60). However, at this point it should be noted that this does not include products that can be recycled after they have been used. Hence, within the scope of the present study, the term refers exclusively to products that are made from recycled materials.

In past publications, recycled products were often assigned to the category of green products (e.g. Biswas 2016, p. 211; Mohd Suki 2015, p. 292). Several recent studies have examined the factors influencing purchase intentions for green products (e.g. Nekmahmud; Fekete-Farkas 2020, p. 1; Testa et al. 2021, p. 4826). However, some recent publications have looked at recycled, remanufactured, and refurbished products, which is why the latter two terms need to be explained in more detail.

*Remanufactured* products are used items converted into new products (Wang; Hazen 2016, p. 460). The used item is disassembled so that it can be repaired, or individual parts can be replaced by new parts. The product is then reassembled as a new one (Hazen et al. 2017, p. 716 from Thorn and Rogerson 2002). The term is reminiscent of repair or reuse (Hazen et al. 2012, p. 782), but it differs in the sense that the products have the characteristics of new products (Atasu; Sarvary; Van Wassenhove 2008, p. 1731). An example of a remanufactured product is a 20-year-old passenger airplane, that is not only repaired, but has its electronics completely replaced and brought up to date (Pearce 2009, p. 61). Remanufacturing is also referred to as the “ultimate form of recycling” (Hazen et al. 2017, p. 716).

*Refurbishing* (or upcycling) is the reprocessing of an existing product so that it can be reused (Münger 2021, p. 43). The used products are usually cleaned before being used for further purposes (Pearce 2009, p. 60). An example of refurbishing is the brand Freitag, which produces bags and other accessories from old truck tarpaulins (Münger 2021, p. 43).

In 2020, Bigliardi et al. (2020, p. 1) published a theoretical framework that uses 20 constructs to encompass the factors influencing the purchase intention for recycled products in particular. Their theoretical framework is given more attention in the present research work, as it is the only publication providing a holistic picture of the otherwise fragmented literature on purchase intentions for recycled products.

Due to their similar meaning, Bigliardi et al. (2020, p. 20) used the terms remanufacturing, refurbishing, and recycling synonymously. Because of the similarity of the terms, and the lack

of literature on purchase intentions regarding recycled products (Bigliardi et al. 2020, p. 12), additional literature concerning green, remanufactured, and reused products is considered in the present study. Nevertheless, the terms are not used interchangeably in the present research.

Based on the literature, the term recycled products is defined as follows in the context of the present study:

*The term "recycled products" refers to newly manufactured products whose raw materials used for production are partly or entirely based on recycled materials.*

## 2.4 Country-Specific Insights

This section provides insight into the status of Germany and South Africa with regard to sustainable development and the circular economy. It also briefly reviews how consumers in the respective countries feel about sustainable products.

### 2.4.1 Germany

In Germany, more than 400 million tons of waste were generated in 2020 (Destatis 2022d). Most of the waste originated from the construction or demolition industries and the extraction of natural resources. Despite the increasing waste production, which is mainly attributable to the private sector, Germany has a good recycling rate<sup>5</sup> in an international context (Nelles; Nassour; Morscheck 2020, p. 131 f). For instance, Germany's recycling rate for household waste is 70%, a rate only exceeded by Belgium and the Netherlands, with around 80% (Deutsche Recycling n. y.). However, regarding the per capita municipal waste<sup>6</sup>, Germany ranks relatively poorly, generating 632 kg of waste per year (more than 100 kg above the EU average) (Destatis n. y.).

New regulations ensure that recycling will have a higher priority in the future (Nelles; Nassour; Morscheck 2020, p. 132). For example, the European Union has drawn up a directive concerning CE. The measures for this directive were laid down in the so-called "Waste Framework Directive" (European Commission n. y.) or officially "Directive 2008/98/EC" (EUR-Lex n. y.). The so-called "waste hierarchy" serves as a starting point, its primary goal being the complete avoidance of waste. For EU member states, targets are set that require active participation in the CE. As one of the member states, Germany has already implemented the directive by introducing the Circular Economy Act. This law serves to conserve natural resources and prevent waste. Since 2020, for example, federal agencies and institutions have been required to purchase products containing sustainable materials (European Commission n. y.), giving priority to recycled products (Urbansky 2020).

Most consumers in Germany (75%) already pay attention to sustainability when buying new products (McKinsey & Company n. y.). Concern for the environment has led German

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<sup>5</sup> Recycling rate refers to the percentage of raw materials that are recycled from waste. (Deutsche Recycling n. y.)

<sup>6</sup> Municipal waste includes waste such as textiles, plastics, paper, glass etc. generated by households, offices, institutions etc. (Destatis n. y.)

consumers to change their shopping behavior. In another study, for example, 26% of respondents said they no longer wanted to buy disposable razors. In general, 25% of shoppers tend to boycott stores and brands if they do not follow an environmentally friendly company policy. The primary factors preventing German consumers from buying sustainable products are a lack of trust in eco-labels and the tendency toward high prices (Statista Global Consumer Survey (GCS) 2021, p. 4 f). Although around 30% believe that companies are responsible for tackling climate change, around half of German consumers think their own behavior plays a role (Statista Global Consumer Survey (GCS) 2021, p. 10).

## 2.4.2 South Africa

In terms of waste management and the introduction of CE, South Africa is said to be two to three decades behind European and other developed countries (Godfrey; Oelofse 2017, p. 1) For example, about 90% of South African waste ends up in landfills (Department of Environmental Affairs 2012, p. 19). This type of waste disposal seems typical for developing countries (Agamuthu 2013, p. 1) and is also the dominant technology of waste processing in South Africa. The low cost of landfilling compared to the costs in European countries<sup>7</sup> is a key reason for the country not switching to alternative technologies (Godfrey; Oelofse 2017, p. 4).

Recycling has been pursued in South Africa for many years (Godfrey; Oelofse 2017, p. 4). After the introduction of the White Paper on Integrated Pollution and Waste Management for South Africa in 2000 (Department of Environmental Affairs and Tourism 2000, p. 5) and the first National Waste Management Strategy (NWMS), further guidelines and laws followed, the aim being to help South Africa develop into a zero-waste nation – for example, through more recycling (Godfrey; Oelofse 2017, p. 4 f). Nevertheless, more than 90% of recycling cooperation's fail in their implementation, which can be attributed to various reasons such as the lack of infrastructure. Another probable reason is the flood of regulations and controls that make it even more difficult to implement reuse, recycling, and recovery activities and the associated additional costs that make companies believe the government primarily wants to earn money (Godfrey; Oelofse 2017, p. 6 f). Of the 100 million tons of waste generated annually (an increasing trend due to population growth), only about 10% is recycled (Department of Environmental Affairs 2018, p. 2).

South Africa is rich in natural resources and is preeminent as an economy based on resource extraction. About 20% of the country's extracted raw materials are exported (Nahman et al. 2021, p. 1). The country is dependent on these natural resources, exposing itself to risks of overexploitation and the demands of the foreign market. Should the European Union continue to implement its plans for a CE, there could be less demand for raw materials, resulting in an estimated 2.7% reduction in South Africa's GDP (Nahman et al. 2021, p. 4). However, even though the CE could theoretically threaten South Africa's economy (Nahman et al. 2021, p. 6), it ultimately benefits the population, the economy, and the environment (Godfrey; Oelofse 2017, p. 8). For this reason, the South African president recently called for the country to follow global developments and participate in the circular transformation. This move is expected that

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<sup>7</sup> In South Africa the „landfill gate fees“ are approx. € 10-15 per tonne (or € 25-40 per tonne in landfills with little space) (Godfrey; Oelofse 2017, p. 4) In Germany, the fees are approx. € 140 per tonne. (European Environment Agency 2013)

to lead to new jobs and an economic upswing for the country (Nahman et al. 2021, p. 6). Furthermore, it is assumed that South Africa will learn much from Europe regarding waste management and will ultimately “follow the same path” (Godfrey; Oelofse 2017, p. 8).

South Africa is exposed to natural disasters such as drought and flooding (Koloba 2020, p. 46). According to the World Risk Report, the country has a relatively high risk of natural disasters in a global comparison<sup>8</sup> (Bündnis Entwicklung Hilft 2022). In April 2022, South Africa was hit by a devastating flood that killed more than 400 people. According to weather experts, the region will face such events with increasing frequency due to ongoing climate change (BBC 2022). According to past studies, increasing environmental degradation is leading to increased consumption of sustainable products. Hence, concern about the environment generally leads to a positive purchase intention; however, in many cases, this does not result in an actual purchase (Koloba 2020, p. 46). This fact is confirmed by a 2020 study stating that South African consumers have only moderately changed their purchasing behavior to be more sustainable. For example, while standard light bulbs are being replaced with energy-efficient versions, other environmentally friendly activities such as avoiding plastic bags or buying recycled paper or recyclable products are absent. Furthermore, South Africans do not boycott environmentally unfriendly stores or brands or encourage friends and family to buy sustainable products (Mkhize; Ellis 2020, p. 18).

## 2.5 Purchase Intention

This section examines the concept of purchase intention and the existing literature on the factors influencing the purchase intention for recycled products. This is followed by an explanation of the theoretical framework that forms the basis of the present research.

### 2.5.1 Definition of Purchase Intention

In the field of marketing, purchase intention has been considered an important predictor of whether consumers are willing to buy a product in the future (Namias 1959, p. 26). This is why the term “purchase intention” is often used synonymously with “willingness to buy” or “intention to buy”<sup>9</sup> (Bigliardi et al. 2020, p. 4). For marketing managers, purchase intention is an important instrument for making strategic decisions about existing or new products (Barber et al. 2012, p. 280), and for developing new markets and customer segments (Morwitz; Steckel; Gupta 2007, p. 347).

The Theory of Planned Behavior (TPB) is particularly relevant to purchase intentions. This theory is a further development of Fishbein and Ajzen's Theory of Reasoned Action (TRA), which was developed in the 1970s. The TRA initially included the variables *attitude* and *subjective norm* and was later supplemented with the variable *perceived behavioral control*, finally giving rise to the TPB (Ajzen 1991, p. 181). These three variables influence intention, which in turn is used to predict future behavior (Ajzen 1991, p. 179). This older theory originated in

<sup>8</sup> By contrast, the risk in Germany is classified as very low, see chart in Appendix B for more insights.

<sup>9</sup> In many publications the term „willingness to pay” (WTP) is used, which should not be used interchangeably with “willingness to buy”. (Bigliardi et al. 2020, p. 5) WTP refers to the highest amount a customer would be willing to spend on a product. (Hanemann 1991, p. 635)

the 1970s and is still considered one of the most influential theories for predicting behavior (Zhuang; Luo; Usman Riaz 2021, p. 3), especially in the field of purchase intentions for green products (Wijekoon; Fazli Sabri 2021, p. 20).

When it comes to the definition of purchase intention, reference is made to the TPB where according to Ajzen (1991, p. 181) the concept of intention is defined as follows:

*"Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance."*

### **2.5.2 Purchase Intention for Recycled Products**

In general, the literature regarding purchase intentions for recycled products is scarce (Calvo-Porral; Lévy-Mangin 2020, p. 1; Bigliardi et al. 2020, p. 1). This fact is confirmed by the literature research carried out as part of the present study. Only 14 relevant publications could be identified for the period 2010 to 02/2022. An overview of all publications is provided in Appendix C.

Another problem is that the existing literature on the topic is fragmented, as the publications rely on different theories originating from psychology, sociology, and marketing (Bigliardi et al. 2020, p. 7). Most publications focusing on recycled products examine the influence of individual factors such as the impact on purchase intention of the quality, image, sustainability, or safety of recycled products (Queiroz et al. 2021, p. 8; Calvo-Porral; Lévy-Mangin 2020, p. 7). Some studies concentrate on the influence of perceived value on purchase intention (Chi et al. 2021, p. 3), while others use adaptations of behavioral theories such as the TRA (Sun; Teh; Linton 2018, p. 2) or the TPB to explain purchase intentions of recycled products. To reduce this complexity, Bigliardi et al. (2020, p. 7) developed a theoretical framework to provide a holistic picture of the factors influencing purchase intention for recycled products, which will be discussed in more detail in the following section.

### **2.5.3 Theoretical Framework**

The present research is guided by the theoretical framework developed by Bigliardi et al. (2020). The authors recently published the article "The Intention to Purchase Recycled Products: Towards an Integrative Theoretical Framework" to form a unified understanding of purchase intention for recycled products. Finally, based on various theories, constructs and perspectives, the authors developed a theoretical framework, which is divided into three blocks: individual-related, context-related, and product-related. The individual-related block contains constructs related to individual values, beliefs, norms, and attitudes. The product-related block contains all constructs that can be attributed to the product, and the context-related block is about factors that influence perception about a product (Bigliardi et al. 2020, p. 6).

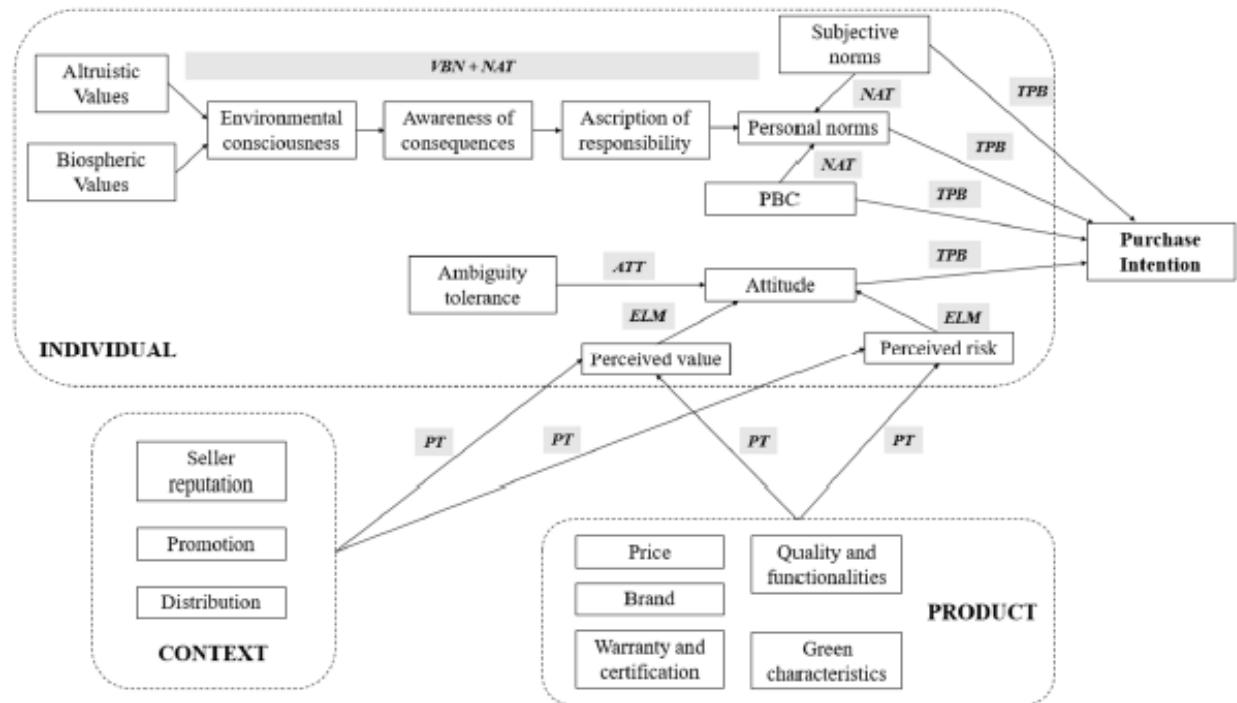


Figure 4: Theoretical Framework of Factors Influencing Purchase Intention for Recycled Products  
Source: Bigliardi et al. (2020, p. 8)

The constructs of the individual-related block were derived from the value belief norm (VBN) and the norm activation theory (NAT), the ambiguity tolerance theory (ATT), the elaboration-likelihood models (ELM) and the theory of planned behavior (TPB). The context-related and product-related blocks were derived from the prospect theory (PT) (Bigliardi et al. 2020, p. 8).

Other publications providing similar theoretical frameworks relating to green products were found. For example, Zhuang and Usman Riaz (2021, p. 1) divided the factors influencing green purchase intentions into three categories: cognitive factors, consumer individual characteristics, and social factors. They aligned with the theory of consumer behavior developed by Engel et al. (1995), who mentioned these three categories as the main factors influencing consumers' purchase decisions. Wijekoon and Fazli Sabri (2021, p. 1) published a literature review on the "Determinants That Influence Green Product Purchase Intention and Behavior" and assigned the numerous identified constructs to five blocks: individual and non-individual factors, situational factors, product attributes, and demographics. In "Why Do Consumers Make Green Purchase Decisions? Insights from a Systematic Review," Zhang and Dong (2020, p. 3) developed a theoretical framework based on various theories. The authors divided their framework into "individual factors, product attributes and marketing, and social factors".

Since the theoretical framework developed by Bigliardi et al. (2020) is the only one with a specific focus on recycled products, it deemed appropriate for the present research. The framework was also already applied in a study on recycled PET products in Brazil (Queiroz et al. 2021, p. 7).

## **2.6 Influencing Factors**

Based on the theoretical framework, this section identifies the influencing factors (or constructs) to be examined in more detail as part of the present study. For reasons of research economics, the most relevant constructs are systematically selected and then defined. Furthermore, hypotheses are derived accordingly.

### **2.6.1 Identification and Discussion of Influencing Factors**

According to Bigliardi et al. (2020, p. 12), the individual-related block has been most frequently explored in past publications. However, to obtain a holistic view, the authors called for all three blocks to be investigated. The current study intends to meet this request, which is why, consequently, the most important constructs for all three blocks will be identified.

For this purpose, the theoretical framework presented by Bigliardi et al. (2020, p. 8) serves as the basic framework for the present research. For reasons of research economics, it is not possible to consider all constructs which is why the theoretical framework must be reduced to the most important constructs.

This reduction is achieved using systematic literature reviews and meta-analyses. These have the advantage of comparing and summarizing the findings of several primary studies. In addition, meta-studies calculate an average of the results of several related studies, which results in a meaningful overall conclusion (Greenhalgh 1997, p. 673 f). When selecting systematic literature reviews and meta-analyses, care is taken to ensure that all publications up to 2020/2021 are included. No literature review or meta-analysis focusing on recycled products could be identified other than the publication by Bigliardi et al. (2020), the literature research was extended to green products in general. Finally, three publications were identified that fulfilled the criteria, and these are briefly detailed below:

Zhang and Dong's (2020) systematic literature review titled "Why Do Consumers Make Green Purchase Decisions? Insights from a Systematic Review" includes 97 papers on purchase behavior and purchase intention of green products (including recycled products) published between 2015 and 2020. The authors identified more than 40 constructs influencing green purchase behavior (Zhang; Dong 2020, p. 4).

Zhuang et al.'s (2021) meta-analysis "On the Factors Influencing Green Purchase Intention: A Meta-Analysis Approach" examined 54 quantitative studies related to green purchase intention from which 11 constructs were identified as relevant (Zhuang; Luo; Usman Riaz 2021, p. 4 f).

Wijekoon and Fazli Sabri's (2021) systematic literature review "Determinants that Influence Green Product Purchase Intention and Behavior: A Literature Review and Guiding Framework" considered 108 papers published between 2015 and 2021. The review identified 212 constructs that influence purchase intention (Wijekoon; Fazli Sabri 2021, p. 1).

## 2.6.2 Selection of Relevant Influencing Factors

This section replicates Bigliardi et al.'s (2020, p. 7 f) theoretical framework and investigates whether and how often these constructs were mentioned in the three publications mentioned in the previous section. Constructs mentioned in at least two of three publications are included in the current research. As the names of the constructs in the three publications are not always identical to those of Bigliardi et al. but nevertheless have the same meaning, the individual names are listed in Appendix D for reasons of comprehensibility.

Block	Constructs / Variables	Description	1 <sup>10</sup>	2 <sup>11</sup>	3 <sup>12</sup>
Individual-related	Altruistic values	Values that let us contribute to the welfare of others			x
	Biospheric values	Values that make us feel concerned for the nature and biosphere			x
	Environmental consciousness/concern	Concern for the environment	x	x	x
	Awareness of consequences	Awareness of what consequences our own behavior has			x
	Ascription of responsibility	Not wanting to take responsibility for the consequences of our own behavior			x
	Subjective norm	Influence of other people on our own behavior	x	x	x
	Perceived behavioral control	To what extent a desired behavior can also be implemented	x	x	x
	Ambiguity tolerance	Being tolerant in contradictory situations			
	Attitude	The attitude leads to a certain behavior	x	x	x
	Perceived value	The "trade-off between perceived benefit and perceived sacrifice"	x	x	x
	Perceived risk	Perceived risk towards a product or service	x	x	x
Product-related	Certification <sup>13</sup>	Certificates or eco-labels on a product	x		x
	Brand equity	The value of a brand			x
	Price	The price of a product	x		x
	Quality and functionalities	The quality characteristics of the product	x	x	x
	Green characteristics	Refers to the green characteristics of the seller			

<sup>10</sup> From Zhang and Dong (2020, p. 7)

<sup>11</sup> From Zhuang et al. (2021, p. 5)

<sup>12</sup> From Wijekoon and Fazli Sabri (2021, p. 7 ff)

<sup>13</sup> Originally: Warranty and Certification. However, Warranty was not included, as the three publications only identified Certification as a factor.

Context-related	Seller reputation	The reputation of the seller			
	Promotion	Advertising and all communication measures	x		x
	Distribution	Access and availability of the products	x		x

Table 1: Development of Relevant Influencing Factors

Source: Own illustration based on Bigliardi et al. 2020, p. 7 f

The research revealed that 11 constructs were mentioned as relevant in at least two of the three publications. In the individual-related block, the constructs *attitude*, *subjective norm*, *perceived behavioral control*, *perceived risk*, *perceived value*, and *environmental consciousness/concern* were mentioned in all three publications. In the product-related block, the constructs price, certification, quality, and functionalities were mentioned in two or three publications, and in the context-related block, the constructs promotion and distribution were mentioned in two publications.

The model is extended to include the construct perceived consumer effectiveness. This construct is not included in the Bigliardi et al.'s framework. However, the construct was mentioned as relevant in all three additional publications, which is why it is included in this study (Zhang; Dong 2020, p. 8; Zhuang; Luo; Usman Riaz 2021, p. 1; Wijekoon; Fazli Sabri 2021, p. 8). The construct is assigned to the individual-related block.

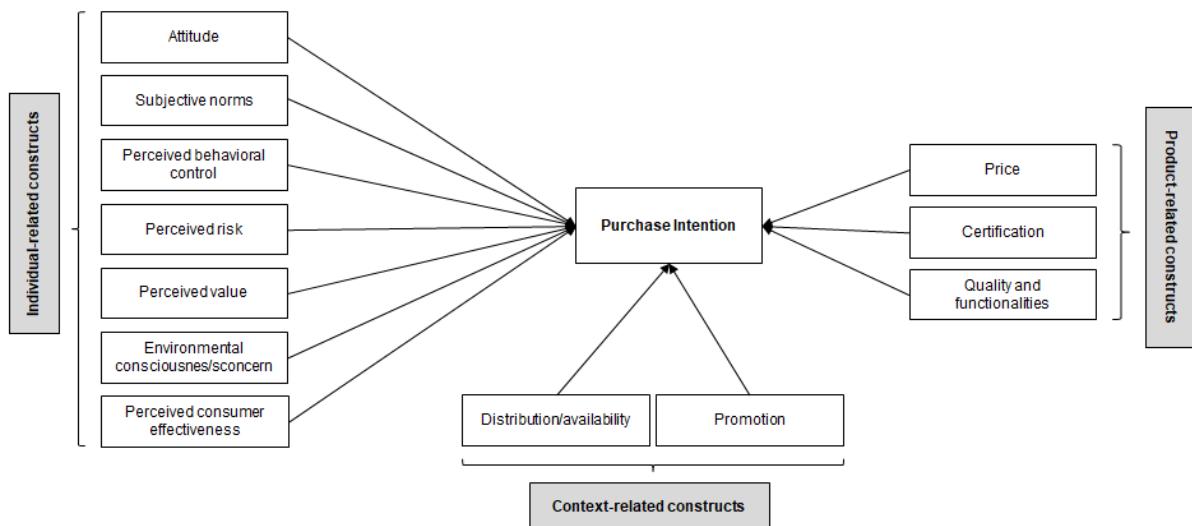


Figure 5: Identified Relevant Constructs Influencing the Purchase Intention for Recycled Products  
Source: own illustration

### 2.6.3 Definition of Relevant Influencing Factors

The 12 identified constructs are examined in this research as factors influencing purchase intentions for recycled products. The constructs are explained in more detail in the following sections and corresponding hypotheses are derived accordingly.

### **2.6.3.1 Individual-Related Constructs**

The construct *attitude* stems from the TPB, for which Ajzen (1991, p. 188) defines it as “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question.” That is, attitudes arise from beliefs that people have about an object. Among other things, people assign attributes to objects they associate with and then evaluate the object as positive or negative, ultimately forming an attitude toward an objective (Ajzen 1991, p. 191). Attitude is significant in connection with purchase intention for green products. Previous studies have discovered that attitude positively influences purchase intention of green or remanufactured products (Hazen; Mollenkopf; Wang 2016, p. 450; Mostafa 2008, p. 113; Chan 2001, p. 401). In some studies, however, attitude has been identified the preeminent factor influencing such purchase intentions (Wang et al. 2013, p. 866; Rausch; Kopplin 2020, p. 1). This finding results in the following hypothesis:

*H1: Attitude has a positive influence on purchase intention for recycled products.*

The construct *subjective norm* is also part of TPB and is defined as “the perceived social pressure to perform or not to perform the behavior.” It is assumed that the greater the subjective norm, the more likely it is that an intention will result in actual behavior (Ajzen 1991, p. 188). Previous research dealing specifically with recycled or remanufactured products has identified subjective norm as positively influencing purchase intention (Park; Lin 2020, p. 626; Khor; Hazen 2016, p. 9). Accordingly, the following hypothesis is proposed:

*H2: Subjective norm has a positive influence on purchase intention for recycled products.*

The construct *perceived behavioral control* is part of the TPB and is defined as “the perceived ease or difficulty of performing the behavior” (Ajzen 1991, p. 188). Perceived behavioral control refers to how difficult or easy it is for consumers to implement a desired behavior (Ajzen 1991, p. 183). For example, if two people have the same intention to learn to ski, the person with the stronger perceived behavioral control is more likely to learn to ski. Perceived behavioral control can substitute actual control as long as people have sufficient information about the behavior and no new, unknown elements are introduced into the situation (Ajzen 1991, p. 184 f). Finally, the greater the perceived behavioral control, the stronger the intention to perform a desired behavior (Ajzen 1991, p. 188). As this has also been confirmed in studies regarding green products (Xu et al. 2020, p. 1; Wang et al. 2018, p. 866), the following hypothesis is offered:

*H3: Perceived behavioral control has a positive influence on purchase intention for recycled products.*

Based on previous literature, Jacoby and Kaplan (1972) identified five types of *risk*, such as financial, performance, physical, psychological and social risk. A sixth type of risk was identified by Stone and Gronhaug (1993, p. 45), relating to the risk of time. According to Stone and Gronhaug (1993, p. 39), risk is perceived when consumers fear losing something, and studies demonstrate that perceived risk toward a product hinders consumers from purchasing it (Chen; Chang 2012, p. 502). Zhuang et al. (2021, p. 11) found that perceived risk negatively influences green purchasing intentions. The more risk consumers perceive in relation to buying a green product, the less willing they are to buy it. Accordingly, the following hypothesis is proposed:

*H4: Perceived risk has a negative influence on purchase intention for recycled products.*

Each individual has their own idea of value. Thus, *perceived value* can be understood in different ways. For one person, there is perceived value when the product has a low price or when its price/performance ratio is perceived to be fair. Other people weigh what they give away and what they get for it, while others consider it valuable if the product has the characteristics that they expect (Zeithaml 1988, p. 13). According to past research, perceived value strongly influences purchase intention for recycled products (Chaturvedi; Kulshreshtha; Tripathi 2020, p. 1). However, based on the results of the existing literature, the following hypothesis is derived:

*H5: Perceived value has a positive influence on purchase intention for recycled products.*

*Environmental concern*<sup>14</sup> is the extent to which people are concerned about the state of the natural environment (Weigel; Weigel 1978, p. 3 ff). The more concerned people are, the more likely it is to affect their behavior (Fransson; Gärling 1999, p. 369). Environmental concern has been identified as one of the major influencing factors for green purchase intentions (Wijekoon; Fazli Sabri 2021, p. 20). Empirical evidence supports the relationship between environmental concern and purchase intention for green products in general (Rausch; Kopplin 2020, p. 11) but also particularly for recycled products (Park; Lin 2020, p. 626). Consequently, the following hypothesis is proposed:

*H6: Environmental concern has a positive influence on purchase intention for recycled products.*

*Perceived consumer effectiveness* means whether a person believes they can contribute to solving environmental problems - for example by buying environmentally friendly products (Kinnear; Taylor; Ahmed 1974, p. 21). According to a 2016 study, the relationship between perceived consumer effectiveness and green purchase intention is significant (Sharma; Dayal 2016, p. 30). Moreover, Wijekoon et al. (2021, p. 20) stated that perceived consumer effectiveness is a key factor influencing purchase intentions for green products. Therefore, the following hypothesis is proposed:

*H7: Perceived consumer effectiveness has a positive influence on purchase intention for recycled products.*

### **2.6.3.2 Product-Related Constructs**

In the case of *price*, it is important to differentiate between the objective price (i.e. actual price) of a product and the perceived price (i.e. the price that people assume they have to pay) (Zeithaml 1988, p. 10). However, in the present study, price is understood as the actual price, which aligns with the approach of several publications. According to Joshi et al. (2015, p. 134), a high price reduces the willingness to buy green products. This observation was confirmed

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<sup>14</sup> The term environmental consciousness is often used synonymously. (e.g. in the publications of Jiménez Sánchez; Lafuente 2010; Park; Lin 2020; Bigliardi et al. 2020) Also in this research, both terms are understood to have the same meaning.

by Nguyen et al. (2018, p. 3619), who identified price as a significant factor in relation to green purchase intentions. Hence, the following hypothesis is proposed:

*H8: A price lower than that of new/conventional products has a positive influence on purchase intention for recycled products.*

Consumers look at *certifications* or *eco-labels* when considering recycled products (Harms; Linton 2015, p. 1). Zhang and Dong (2020, p. 11) refer to publications that confirm the importance of eco-labels when buying green products. Riskos et al. (2021, p. 1) investigated whether eco-labels influence green product purchasing attitudes and behavior. They revealed that eco-label credibility positively influences attitude and behavior toward purchasing green products. Therefore, the following hypothesis is proposed:

*H9: Eco-labels have a positive influence on purchase intention for recycled products.*

*Quality*, or perceived quality, is the subjective perception of the quality of a product (Zeithaml 1988, p. 3). According to Magnier et al. (2019, p. 94) customers are more likely to purchase a recycled product if the quality is expected to be the same as that of products made from new/conventional materials. However, research shows that recycled products are judged to be of lower quality, which ultimately reduces purchase intention (Queiroz et al. 2021, p. 1). This fact is confirmed by further studies (e.g. Luu; Baker 2021, p. 1; Bae 2021, p. 553).

It is not only the quality that negatively impacts purchase intention but also the *contamination* associated with recycled products (Magnier; Mugge; Schoormans 2019, p. 94). This finding is supported by previous researchers such as Baxter et al. (2017, p. 1), who revealed that consumers are not willing to purchase products if they think that they are contaminated. Therefore, the following two hypotheses are made:

*H10: Perceived quality has a negative influence on purchase intention for recycled products.*

*H11: Perceived contamination has a negative influence on purchase intention for recycled products.*

### **2.6.3.3 Context-Related Constructs**

Bigliardi et al. (2020, p. 7) defined the *promotion* construct as communication activities that ensure potential consumers are made aware of products and ultimately consider buying them. Qu et al. (2018, p. 92), who examined the effect advertising has on the purchase of remanufactured heavy-truck engines, concluded that advertisement has a positive influence on purchase intention and therefore influences people's attitudes toward the remanufactured heavy-truck engines. Zhuang et al. (2021, p. 11) recommend that companies promote green products, as this promotion positively affects purchase intention. Therefore, the following hypothesis is offered:

*H12: The promotion of recycled products has a positive influence on purchase intention.*

The *availability* of products also positively affects purchase intention for recycled products (Bigliardi et al. 2020, p. 10). Concerning distribution, Bigliardi et al. (2020, p. 7) refer to the availability of the products in different markets, territories, or geographical areas. A qualitative study by Connell (2010, p. 279) investigated the major barriers consumers face when

purchasing sustainable apparel. One of the major barriers identified was the lack of availability of such products. Furthermore, Walia et al. (2019, p. 108) identified that product availability significantly influences purchase intention of green products. Nguyen et al. (2018, p. 9) came to the same conclusion, which leads to the following hypothesis:

*H13: The availability of recycled products positively influences the purchase intention.*

## 2.7 Product Types

This section explains why it is important to investigate different product types and derives a hypothesis accordingly. Furthermore, the section identifies the products to investigate within the present study.

### 2.7.1 Selection of Different Product Types

Magnier et al. (2019, p. 84) investigated consumers' evaluations of recycled ocean-plastic products. The authors mention that past research has revealed a difference in consumers' responses to different types of products, based mainly on the research findings of Hamzaoui Essoussi and Linton (2010, p. 462). However, Magnier et al. (2019, p. 87) state that the differences have various causes. They summarize some of these as follows:

- How often consumers purchase a product
- How consumers expect a product to perform
- How long consumers expect a product to last
- The level of symbolic value a product has for consumers
- The degree to which a product is used in public by consumers

Based on these aspects, Magnier et al. (2019, p. 87) successfully deduced what types of products they wanted to investigate in their research, namely products made of ocean plastic for textile products, durables, and fast-moving consumer goods (FMCGs). They selected these products because they expected them to reveal the greatest differences in consumers' evaluation and because it is possible to manufacture such goods with recycled ocean plastic. More specifically, they chose textile products (a sweater and running shoes) because of their symbolic value and consumers' expectations of their performance. The arguments for choosing durables (a vacuum cleaner and coffee machine) and FMCGs (a dishwasher soap and a tube of hand cream) were the expected life duration (long and short) and perceived contamination of the products.

Similar research was conducted by Mobley et al. (1995, p. 173) who examined consumers' reactions to personal hygiene-related recycled products. The authors chose a greeting card (not relevant to personal hygiene) and a facial tissue (relevant for personal hygiene) made of recycled materials. However, although the respondents in both cases preferred the recycled products over the non-recycled ones, no product preferences were discovered.

For this reason, the approach of Magnier et al. is applied in the present study and items such as textile products, durables, and FMCGs are used. Unlike Magnier et al., this study examines

a single product per category due to reasons of research economics. Reflecting this, the following hypothesis is proposed:

*H14: The purchase intention for recycled products varies based on different product types.*

For the current study, it is furthermore essential that the chosen products are widely available to the target groups in Germany and South Africa. The products also need to be made of recycled material in order to measure the intention-behavior gap (which is explained in the next chapter). Consequently, textiles (apparel), electronics (durables) and paper (FMCGs) are chosen.

### **2.7.1.1 Textiles (Apparel)**

Clothing is an important part of our lives. Almost everyone wears it and uses it to express their individuality. In recent years there has been a trend toward fast fashion, which allows consumers to purchase current fashion cheaply. Due to this trend, the production of textiles has doubled in the last 15 years, leading to adverse environmental consequences, since the majority of fast-fashion apparel is made from non-renewable resources and more than 50% fast-fashion goods are thrown away after less than a year. Currently, the apparel industry is increasingly operating on a linear system that wastes resources, causes pollution, and ultimately harms the environment. As a solution, the Ellen MacArthur Foundation speaks of a “new textile economy”, – moving away from the linear-, toward the circular economy, with recycling being an essential part of the solution (Ellen MacArthur Foundation 2017, p. 1 f). Patagonia is one brand that successfully produces apparel made from recycled materials. Since 1993, the company has been producing clothing such as fleece jackets made from recycled polyester (Meng; Leary 2019, p. 3). The approach has recently been adopted by companies such as H&M, which started to stocking products made from recycled or other sustainable materials under their own “Conscious” product line. The company has gone one step further by claiming it will produce all its products from completely sustainable materials by 2030 (H&M n. y.). Brands such as Adidas, Nike, and The North Face have followed this approach, investing significantly in the development of sustainable products (Meng; Leary 2019, p. 3). However, research shows that the fiber content of apparel is the most important factor for consumers when they consider purchasing apparel (Hatch; Roberts 1985, p. 341), and in many cases, consumers still perceive recycled material as unhygienic, which is especially true for textile products that touch the skin (Meng; Leary 2019, p. 1).

Hence, it is highly relevant for the current study to examine a **t-shirt** as one of the three products.

### **2.7.1.2 Durables (Electronic Devices)**

Electronic waste has increased enormously due to rapid technological development, notably computers and mobile phones. On average, mobile phones are disposed of after one year and computers after two to five years, which means 100 million phones and 17 million computers end up in the landfill every year. This steady increase in electronic waste ultimately threatens the natural environment (Kaya 2016, p. 96). Hence, electronics is another area where recycling is expected to make a significant contribution to the sustainable protection of the planet. For several years now, Apple has been taking back used electrical devices. The

devices are dismantled, and valuable materials such as tin, cobalt, and aluminum are fed back into the manufacturing process for use in new devices. In 2018, Apple recycled 48,000 tons of e-waste (Apple 2019). This is also done by the Dutch company Fairphone. Unlike Apple, however, Fairphone advertises that it sells phones made from recycled materials (Fairphone n. y.). No study investigating purchase intention for recycled mobile phones could be identified. However, one study revealed that consumers do not consider purchasing refurbished mobile phones for various reasons, including perceived risk and customers' lack of awareness of refurbished products (van Weelden; Mugge; Bakker 2015, p. 743).

Therefore, a **mobile phone** is chosen to as one of the investiagted items in the present research.

### 2.7.1.3 FMCGs (Paper Products)

For many centuries, paper has been produced using various materials, such as cotton or linen. However, after the huge increase in the demand for paper in the 20<sup>th</sup> century, more and more trees were cut down for paper production (McKinney 1995, p. 1). In the past 40 years, paper consumption has increased by more than 400%, and today more than one-third of all harvested trees are used for paper production (Rockstock n. y.). It is not only the tree-felling that is harmful to the environment but the paper production process itself. Recycling plays a crucial role in protecting the environment sustainably (Ozola et al. 2019, p. 268 cited from Pulp and Paper). On average, 58% of the paper in circulation is already recycled, while in developed countries the figure is 75% (Cepi 2015). One product that can be made from recycled material is toilet paper (Laurijssen et al. 2010, p. 1211). The latter was considered by Kishino et al. (1999, p. 189), and it fits the present study, since consumers have the choice of using toilet paper made from new or recycled paper. However, one study suggested that consumers preferred toilet paper made of new material because it is more visually appealing while recycled paper ultimately had a negative image (Hanyu et al. 2000, p. 177).

This finding makes **toilet paper** a pertinent product for the present research.

In conclusion, this study considers a t-shirt (textiles), a mobile phone (durables), and toilet paper (FMCGs).

## 2.8 Intention-Behavior Gap

The terms "intention-behavior gap" or "attitude-behavior gap" are frequently encountered, especially in connection with sustainable consumption (e.g. ElHaffar; Durif; Dubé 2020, p. 1; Nguyen; Nguyen; Hoang 2018, p. 1; Frank; Brock 2018, p. 1). ElHaffar et al. (2020, p. 3) combined both terms and referred to the so-called green gap. The authors highlighted contradiction when consumers claim to be worried about the environment but do not contribute to solving environmental issues. Because of their different meanings, *intention* and *attitude* should not be used synonymously (ElHaffar; Durif; Dubé 2020, p. 14).

Since the present study deals with purchase intentions, it focuses specifically on the intention-behavior gap, whose origin lies in the TPB. Ajzen (1991, p. 181 ff) asserts that intentions are the most important predictor of behavior, but that actual behavior does not always correspond to intentions. For example, a medium to large change in intention leads to only a small to

medium change in actual behavior (Webb; Sheeran 2006, p. 249). A meta-study from 2002 showed that only 28% of intentions lead to behavior (Sheeran 2002, p. 29), while in a recent study from 2016, this figure had risen to around 50% (Sheeran; Webb 2016, p. 511). ElHaffar et al. (2020, p. 13) recommended that the green gap should be studied continuously it may eventually be affected by rapid societal change. Furthermore, Park and Lin (2020, p. 627) discovered that the intention-behavior gap is dependent on different product types. Hence, the present study investigates whether an intention-behavior gap exists in general and among the three chosen product types, proposing the following hypotheses:

*H15: There is a gap between the intention to buy recycled products and actual behavior.*

*H16: The intention-behavior gap differs for different product types.*

## 2.9 Country-Specific Differences

Regarding purchase intention for green products, the small number of publications regarding cultural or country-specific differences are often criticized (e.g. Zhang; Dong 2020, p. 4; Testa et al. 2021, p. 4828). Most publications concerning green products focus on Asia or Europe (Testa et al. 2021, p. 4828). Zhang and Dong (2020, p. 4) identified just four cross-cultural studies involving developed and developing countries. One of them compares the differences in green purchase intentions in high context (American) and low context (Indian) cultures (Patel; Trivedi; Yagnik 2020, p. 1). Another study examines the green purchase behavior of young consumers in the US and India (Muralidharan; Rejón-Guardia; Xue 2016, p. 1); one looked at motivations for sustainable consumption in Germany and China (Ali et al. 2019, p. 1); and another examined consumption values in the UK and China (De Silva; Wang; Kuah 2021, p. 713).

No existing study could be identified that examines country- or culture-specific differences in purchase intentions for recycled products. Various publications have called for an investigation of cultural differences in purchase intentions for recycled products (e.g. Bigliardi et al. 2020, p. 13; Magnier; Mugge; Schoormans 2019, p. 95). However, the subsections above suggest influencing factors vary. This research aims to discover what these factors are; hence, the following hypothesis is proposed:

*H17: The influencing factors of purchase intentions for recycled products differ between Germany and South Africa.*

### 3 Methodology

This section explains the research model and design before operationalizing the individual constructs. The sample design and the questionnaire are then discussed, followed by a data analysis section and the proposal of an adjusted research model.

#### 3.1 Research Model and Design

The central question of the present study concerns the factors that influence purchase intentions for recycled products in Germany and South Africa. Hypotheses 1 to 13 are intended to provide information on how the respective factors influence purchase intentions and the differences that exist between Germany and South Africa (H17). Furthermore, the first subquestion addresses whether there is a difference in purchase intention with regard to different product types and the respective countries (H14), while the second subquestion deals with the intention-behavior gap and ascertains out whether this exists in the respective countries and whether there is a difference with regard to the different product types (H15 and H16).

The following figure illustrates the research model:

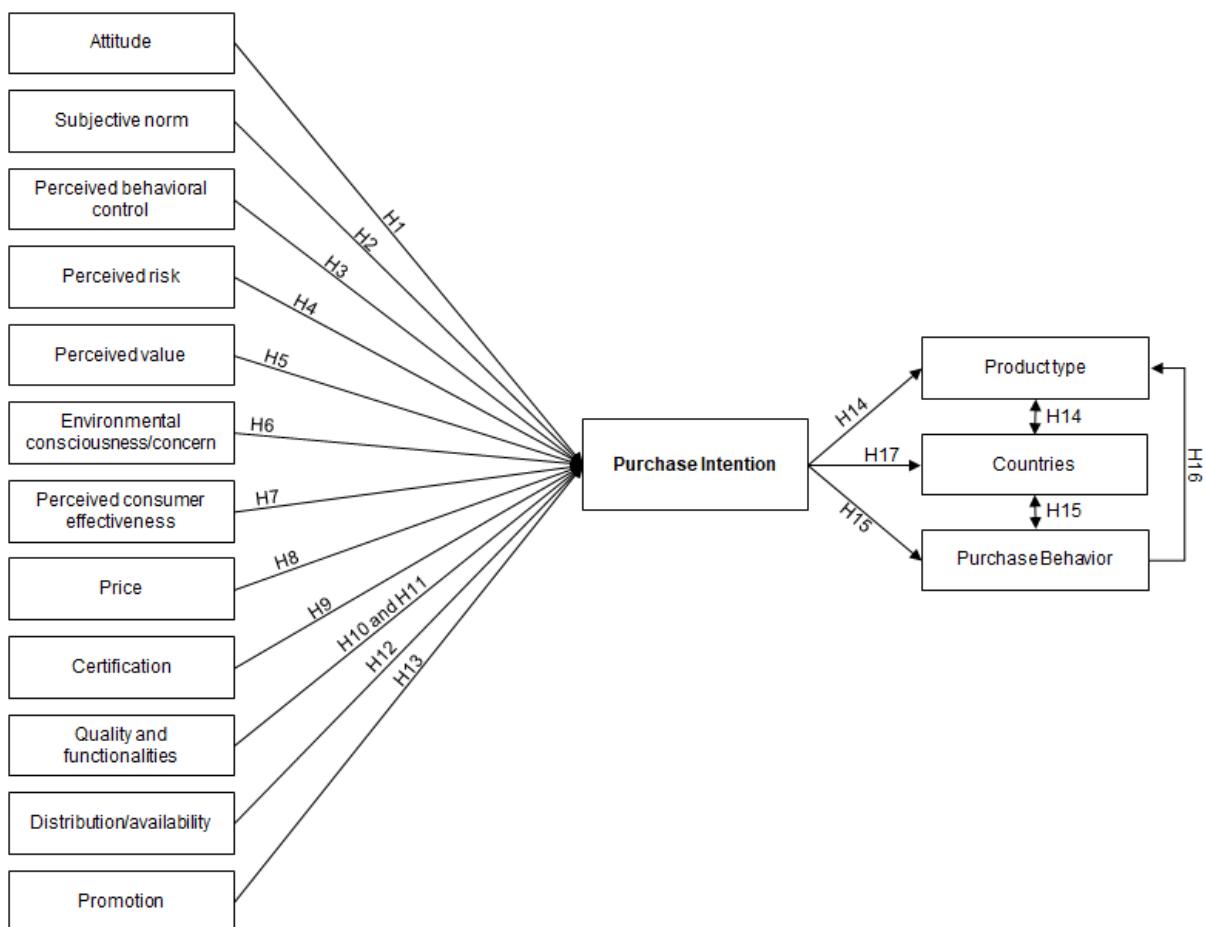


Figure 6: Research Model, Summary of Proposed Hypotheses  
Source: Own illustration

With regard to the research design, the approach chosen was the one best suited to addressing the research questions and was practical in terms of research economy (Döring; Bortz 2016, p. 184). For this reason, the deductive research approach was chosen, which means that hypotheses were derived from existing theories (Saunders; Lewis; Thornhill 2009, p. 125).

Typically, deductive studies collect quantitative data, for which large samples must be selected to ensure generalizability (Saunders; Lewis; Thornhill 2009, p. 125). Surveys are particularly well suited for this purpose, since they have the advantage of collecting data from large samples. The data collected by the survey can be analyzed using descriptive and inferential statistics. In addition, relationships between variables can be analyzed, and inferences that are valid for the entire population can be made, provided that the sample is representative (Saunders; Lewis; Thornhill 2009, p. 145).

To collect the data, an online survey using online questionnaires is particularly suitable, as it is very efficient (Döring; Bortz 2016, p. 415). Online questionnaires have the advantage that the data can be collected quickly, are easy to set up due to user-friendly interfaces, are unrestricted in terms of time and geography (Callegaro; Lozar Manfreda; Vehovar 2015, p. 20 ff), which is helpful in the present study, as the survey is conducted in Germany as well as South Africa.

In deductive studies, the constructs must be operationalized and thus made measurable (Saunders; Lewis; Thornhill 2009, p. 125). In this study, existing theory that has already measured the constructs is used, as described in the following section.

## 3.2 Operationalization

There are usually several possibilities for operationalizing a theoretical construct. The appropriate operationalization is selected based on the concept specification (Döring-Bortz p. 228). In the present study, past research on purchase intentions for green products is used to measure the constructs with at least three items each. Established scientific measurement instruments are used, which had already been tested for their quality criteria. Furthermore, care is taken to ensure that, wherever possible, three indicators should measure each construct to achieve higher validity and reliability (Döring; Bortz 2016, p. 330).

### 3.2.1 Individual-Related Constructs

To operationalize the construct *attitude* in the context of green products, Chan (2001, p. 397), Mostafa (2008, p. 108), Wang et al. (2013, p. 884), Hazen et al. (2016, p. 464), and Rausch and Kopplin (2020, p. 8) used the scale provided by Taylor and Todd (1995). Chan (2001, p. 397) described the three items as follows: "I (1 = dislike; 7 = like) the idea of purchasing green", "Purchasing green is a (1 = bad; 7 = good) idea" and "I have a/an (1 = unfavorable; 7 = favorable) attitude toward purchasing green products". The same three items are adopted in the present study to measure attitude toward recycled products.

A standard way of measuring *subjective norm* is to ask how important people (family, friends, partners, etc.) feel about a certain behavior to ascertain the extent to which one's behavior is influenced by them (Ajzen 1991, p. 195). Rausch and Kopplin (2020, p. 7) and Kumar et al.

(2016, p. 4) measured subjective norm by using the scale devised by Vermeir and Verbeke (2007, p. 546), which originally consisted of five items: "People who are important to me / family / society / friends / people who influence my buying behaviour think I should buy sustainable food products". Xu et al. (2020, p. 7) took a similar approach based on Han and Kim (2010, p. 663) and Chen and Tung (2014, p. 228), using three items only. For reasons of research economics, Xu et al.'s (2020, p. 7) approach was chosen due to the reduced number of items. Therefore, three items are adopted accordingly to measure subjective norm.

Wang et al. (2013, p. 885) measured the construct *perceived behavioral control* regarding remanufactured auto parts following the approach of Taylor and Todd (1995) and Bansal and Taylor (2002), using three items: "I know where to buy remanufactured auto parts", "I can recognize remanufactured auto parts easily" and "I can buy the remanufactured auto parts I need conveniently". For the current research, the three items of Wang et al. (2013, p. 885) are adopted.

Pretner (2020, p. 7) measured *environmental concern* by combining six items from Dermody et al. (2015, p. 1500) and Polonsky et al. (2012, p. 250). However, due to reasons of research economics the scales used by Park and Lin (2020, p. 625) and Rausch and Kopplin (2020, p. 7) seem more suitable for the current study since they include three and four items only. The items they used were originally adopted from Dunlap et al. (2000, p. 433). The items used in the current research are "I am concerned about the environmental development", "I am concerned about the long-term consequences of unsustainable behavior", and "I am concerned that humanity will cause a lasting damage towards the environment".

Past research has assigned distinct dimensions to the different *risk* types and measured them with several items (Featherman; Pavlou 2003, p. 471; Park; Lin 2020, p. 625; Kim; Jung; Lee 2021, p. 10). However, Wang et al. (2013, p. 884) and Wang and Hazen (2016, p. 464) considered risk as one dimension, and in their studies, each item consists of one type of risk. The items were based on research by Grewal et al. (1994), McCorkle (1990), Peter and Tarpey (1975), Featherman and Pavlou (2003), and Dodds et al. (1991). For reasons of research economics, risk is considered as one dimension in the present study. Hence, a combination of the items from Wang et al. (2013, p. 884) and Wang and Hazen (2016, p. 464) were used. Therefore, risk is measured using six items: physical, performance, financial, time, social and psychological risk.

Sweeney and Soutar (2001, p. 203) developed a scale for measuring *perceived value*. They identified four dimensions: emotional, social, quality/performance, and price/value for money. In previous research, the various dimensions of perceived value have been measured individually using three or four items each (Kim; Jung; Lee 2021, p. 10), or perceived value has been considered as a single dimension (Wang; Hazen 2016, p. 464; Wang; Hazen; Mollenkopf 2018, p. 30). However, the present study considers perceived value as a single dimension and, therefore, uses a combination of three items based on Wang and Hazen (2016, p. 464) and Wang et al. (2018, p. 30), based on Monroe & Krishnan (1985), Zeithaml (1988), and Dodds et al. (1991).

Park and Lin (2020, p. 625) followed the approach of Kim and Choi (2005, p. 595) and measured the *perceived consumer effectiveness* with items such as: "I feel I can help solve natural resource problems by using this product" and "I feel capable of helping solve environmental

problems by using this product". This approach is similar to that of Ellen et al. (1991, p. 107). However, since Ellen et al.'s (1991, p. 107) approach is more general than that of Kim and Choi (2005, p. 595), it is adopted for the current study.

### 3.2.2 Product-Related Constructs

In previous studies, *price* has been measured in various ways. For example, Hamzaoui Essoussi and Linton (2010, p. 461), Guagnano (2001, p. 433) and Harms and Linton (2015, p. 3) measured the dimension "willingness to pay" using open questions such as how much more or less respondents were willing to pay for a recycled product compared to a product made of new/conventional materials. Magnier et al. (2019, p. 96) used two items to measure willingness to pay, specifically asking if respondents were willing to pay a higher or lower price for products made of recycled materials compared to new/conventional ones. Similarly, Nekmahmud (2020, p. 23) measured the dimension "green awareness of price" using two items: "I would choose environmentally friendly goods and services, campaigns or companies if the price were the same" and "If the price of green products is less expensive, I'm willing to change my lifestyle by purchasing green products." Similar items were used by Nguyen (2018, p. 6 f), who was additionally interested ascertaining whether respondents were willing to purchase green products when they were on sale or promotion, which is, however, not of interest in the present study. Therefore, the scales from Magnier et al. (2019, p. 96) and Nekmahmud (2020, p. 23) are adopted, and price was measured using three items, such as "I would pay more/less for a recycled product than for a product made of new/conventional materials" and "If the price of a recycled product was the same as the price for a product made of new/conventional materials, I would choose the recycled product."

Queiroz et al. (2021, p. 10) investigated whether perceived *quality* influences purchase intention for recycled PET products using three items: "Recycled products have good quality", "Recycled products give me the quality that I expect" and "Recycled products have a quality similar to that of products that are not sustainable". Based on the items provided by Sprott and Shimp (2004, p. 308), Magnier et al. (2019, p. 96) followed a similar approach to measure perceived quality. However, unlike Queiroz et al. (2021), they also measured whether contamination influences purchase intention. For this purpose, they used three items provided by Argo et al. (2006, p. 85). For the present study, a combination of Queiroz et al. (2021) and Magnier et al. (2019) is used to measure whether perceived quality and contamination influence purchase intentions for recycled products. As a result, two items were used to measure perceived quality, and two were used to measure the perceived contamination of recycled products.

Concerning the construct *certification* reference is made to eco-labels in particular. Riskos et al. (2021, p. 17) measured both, eco-label credibility and the involvement. For each dimension, they used three and four items based on Taufique et al. (2019, p. 309). Nittala et al. (2014, p. 145) examined the effect of eco-labels on the willingness to purchase green products by looking at such labels as one dimension and using items such as "I purchase the green products if they are certified by Environmental Organization" and "I trust the eco-friendly claims in the advertisements". For the current research, three items from Riskos et al. (2021, p. 17) and Nittala et al. (2014, p. 145) are used to ascertain whether eco-labels influence purchase intention for recycled products.

### 3.2.3 Context-Related Constructs

Walia et al. (2019, p. 217) measured product *availability* with two items: “lack of availability of green products influences my purchase intention” and “not much variety is available in eco-friendly fast moving consumer goods”. Similarly, Nguyen et al. (2018, p. 7) used three items to measure whether the (un)availability of green products influences purchase intention. A combination of these two approaches is adopted in the present study.

To measure the impact of environmental advertisements on consumers’ purchase behavior, Rahbar et al. (2011, p. 77 f) used four items similar to those of Qu et al. (2018, p. 92), who examined, among other things, the effect advertising has on the purchase of remanufactured heavy-truck engines. The current research uses their scale, which is based on the research by Hammond et al. (1998).

### 3.2.4 Dependent Variables

To measure the *intention-behavior gap*, Sheeran (2002, p. 6) presented the 2 x 2 matrix, which examines intention vs. non-intention and actual behavior vs. non-behavior. This reveals two groups responsible for the gap: those with intentions that are consistent with actual behavior (inclined actors) and those who have no intentions but still exhibit behavior (disinclined abstainers).

**Table 1.2** Decomposition of the intention-behavior relationship

Subsequent behavior	Intention	
	Positive	Negative
Acted	Inclined actor	Disinclined actor
Did not act	Inclined abstainer	Disinclined abstainer

Table 2: Sheeran's Decomposition of the Intention-Behavior Relationship

Source: Sheeran 2002, p. 6

To measure the intention-behavior gap, it is therefore necessary to measure both, the variable purchase intention and the variable purchase behavior.

Based on Wee et al. (2014, p. 389), Wang et al. (2018, p. 10) used three items to measure the *purchase behavior* of remanufactured products: “I have purchased remanufactured products in the past few years”, “I often purchase remanufactured products on regular basis” and “I often purchase remanufactured products because they are environmentally friendly”. Rausch and Kopplin (2020, p. 7) and Kumar et al. (2016, p. 4) measured purchasing behavior based on the scale from Schlegelmilch et al. (1996, p. 41) using similar items. Furthermore, Schlegelmilch et al. (1996, p. 41) developed a five-point scale that measures the specific purchasing behavior of different product categories (1 = “Would never buy”, 5 = “Would always buy”). Their scale was adopted for the present study.

Regarding *purchase intention*, Han and Kim (2010, p. 663) developed a scale with three items to measure the intention to revisit a green hotel. The same scale was used by Chen and Tung (2014, p. 228), who also examined the intention to visit green hotels, and by Xu et al. (2020, p. 7), who investigated purchase intention for green furniture. Rausch et al. (2020, p. 7 f) produced a similar scale. Based on Kumar et al. (2016, p. 4) and Park and Lin (2020, p. 625),

they developed items to measure purchase intention for sustainable clothes, including “I consider purchasing sustainable clothes” and “I intend to purchase sustainable clothes instead of conventional clothes in the future”. Wang et al. (2018, p. 10), Khor and Hazen (2016, p. 14), and Wang et al. (2013, p. 885) used similar scales with three or four items to measure purchase intention for remanufactured products in particular. Three items provided by Wang et al. (2018, p. 10) are adopted for this research.

An overview of all items used can be found in Appendix E.

### **3.3 Sample Design**

This section describes the target population and presents the calculation and detailed description of the sample and the respective quotas.

#### **3.3.1 Target Population and Sample**

The target population includes individuals aged 18 and above who have access to the internet and are from Germany or South Africa. The target population was represented by a sample. For this purpose, the appropriate sample size is first calculated using the following formula:

$$n = \frac{s^2 * Z^2}{E^2}$$

For the calculation, values from practical experience are used, where 1.1 is usually used as the standard deviation ( $s^2$ ) (Heidig; Dobbelstein 2021, p. 67 f). However, in terms of security aspects and avoid a too-small sample, another 0.1 is added, which leads to an estimated  $s^2$  of 1.2. The 95% confidence interval is used as the reliability value, for which a Z value of 1.96 ( $Z^2$ ) and an allowed error of 0.1 ( $E^2$ ) are applied (Heidig; Dobbelstein 2021, p. 67 f).

$$n = \frac{1.2^2 * 1.96^2}{0.1^2} = 553.19$$

This results in a sample size of 554, which should be achieved per country in any case. However, for this study, a sample size of 600 per country is chosen to compensate for eventually implausible answers.

Non-probabilistic quota sampling is used to determine the samples to be reached to ensure that the populations are as representative as possible. For this purpose, the populations for South Africa and Germany are each divided into groups and, based on available data, a quota to be fulfilled will be determined for all groups (Saunders; Lewis; Thornhill 2009, p. 235).

In South Africa, the Gini coefficient is 62, suggesting that there is a large disparity in terms of income (OECD Data n. y.); hence, only a small number of people might be able to consider purchasing products with higher prices (Dobbelstein; Corbishley; Mason 2021, p. 62) such as a recycled mobile phone. For this reason, the eligible participants for the South African sample were those with higher living standards/incomes, which is why the South African Living Standards Measure (LSM) groups 7 to 10 are used. Since past studies have also selected LSM groups 7 to 10 in contexts with similar rationale, this approach is also adopted for the present study (e.g. Dobbelstein; Corbishley; Mason 2021; Dobbelstein; Naidoo 2020). The LSM

groups are a common segmentation method for the South African market (South African Audience Research Foundation 2017). LSM group 1 is the group with the poorest living standards, while LSM group 10 is the group with the highest living standards (Ntloedibe; Ngqinani 2020). LSM groups 7 to 10 include people with at least a school-leaving certificate who have access to common media and own a mobile phone, TV, and radio. In addition, these people have electricity and, for example, a flush toilet, a refrigerator, and spend money on take-away food (United States Department of Agriculture 2020, p. 2 f). Data from 2015 show that approximately 35% of all South Africans older than 15 live in LSM groups 7 to 10. Most people are probably older than 35. The proportion of 35+ year-olds is much larger in LSM groups 7 to 10 than in the lower LSM groups. Over one-third have a monthly household income of 20,000 Rand (R). The majority of South African university graduates (90%) are in LSM groups 7 to 10, with one in five in LSM group 10 having a degree (Chronis 2012).

In contrast to South Africa, Germany's Gini coefficient of 29 indicates a much greater income balance (OECD Data n. y.), which is why it can be assumed that a large proportion of the population is in a position to buy recycled products such as mobile phones. For this reason, a quota sample is created for Germany, based on age (18 years and older), gender, and net household income.

### 3.3.2 Calculation of Quotas

The quotas for South Africa and Germany are calculated using existing data. The following table provides information on the proportions to be determined for the respective groups:

Quotas for South Africa <sup>15</sup>		
LSM group	SEM % applied to LSM	Target quota in %
LSM 7	9%	30.00%
LSM 8	7%	23.33%
LSM 9	6%	20.00%
LSM 10	8%	26.67%

Table 3: Target Quotas for South Africa

Source: Own calculation based on The Broadcast Research Council of South Africa (2019, p. 78)

Quotas for Germany		
Age group (Destatis 2022b)	Total population	Target quota in%
18 – 24	6,161,121	8.88%
25 – 34	10,494,027	15.12%
35 – 49	15,361,624	22.13%
50 – 64	19,122,679	27.55%
65+	18,271,636	26.32%
Total	69,411,087	100.00%
<hr/>		
Income group <sup>16</sup> (Destatis 2022c)	Total population	Target quota in%
Less than € 1,250	6,209	15.36%

<sup>15</sup> The Socio-Economic Measure (SEM) is another segmentation method in South Africa that is very similar to the LSM segmentation and is even expected to replace it in the near future (Bierman 2021). Since the commercial panel provider can only segment by LSM groups, the proportions of the SEM groups are taken as a proxy for the LSM groups.

<sup>16</sup> Monthly household net income

<b>€ 1,250 to € 2,000</b>	7,983	19.74%
<b>€ 2,001 to € 3,000</b>	9,528	23.56%
<b>€ 3,001 to € 5,000</b>	10,798	26.71%
<b>€ 5,001 and more</b>	5,914	14.63%
<b>Total</b>	40,433	100.00%
<b>Gender Group</b> (Destatis 2022a)	<b>Total Population</b>	<b>Target quota in %</b>
<b>Male</b>	33,963,124	48.93%
<b>Female</b>	35,447,963	51.07%
<b>Total</b>	69,411,087	100.00%

Table 4: Target Quotas for Germany

Source: Own calculation based on data from Destatis

The links to the online questionnaires and the respective target quotas were sent to a commercial panel provider, responsible for conducting the data collection. Such commercial panel providers can draw on a pool of members who receive vouchers, paymentm or other forms of remuneration for participating in surveys (Döring; Bortz 2016, p. 297). The questionnaire was made available between April 29 and May 18, 2022. By then, the relevant quotas were expected to be fulfilled.

### 3.4 Questionnaire

This section explains the design and structure of the questionnaire. Furthermore, the importance of conducting a pretest is outlined.

#### 3.4.1 Structure

The online questionnaire was created using the software UNIPARK. The questionnaire was prepared in English (for the South African sample) and German (for the German sample).

As an introduction, the participants were briefly instructed on the purpose of the data collection and a definition of recycled products was presented. Moreover, they were informed that the data would be collected anonymously. Subsequently, demographic data such as gender, age, highest level of education and monthly net household income were requested. The questionnaire was divided into four sections. The first three sections contained questions on individual-, context- and product-related constructs. Since the constructs were measured with three items each, some of the questions appeared similar, the questions were randomized. The last section dealt with questions concerning the dependent variables purchase intention and purchase behavior. The questions in the four sections could be answered using a 7-point Likert scale regarding agreement (1 = strongly disagree / 7 = strongly agree) and frequency (1 = all the time / 7 = never). In There were 50 questions to be answered, resulting in a questionnaire duration of five to seven minutes.

For international studies, where the questionnaires are multilingual, it is vital to ensure the questionnaire has the same meaning for all participants. For this reason, the back-translation technique was used. The questionnaire, originally written in English, was first translated into German. An English native speaker then translated the German text back into English (Saunders; Lewis; Thornhill 2009, p. 383 ff). Subsequently, the questionnaire was reviewed to see whether it contained inconsistencies, which were discussed and, if necessary, eliminated. The

questionnaires are reproduced in Appendix F: Survey for the South African Sample (english) and Appendix G: Survey for the German Sample (german).

### **3.4.2 Pretest**

To avoid any complications during the execution of the questionnaire, it is important for pretests to be performed (Döring; Bortz 2016, p. 585). Before conducting the pretests, the English questionnaire was sent to three marketing experts in South Africa. Their feedback on content and language was reviewed and adopted accordingly. Subsequently, 20 South African and German participants received the survey link to the pretest. The participants were able to post their comments directly into the questionnaire using the pretest function offered by UNIPARK.

After all comments from the pretest participants were reviewed and, where necessary, implemented, the randomized questionnaire was sent to the commercial panel provider, who subsequently made it available to its customer panel for response.

## **3.5 Data Analysis**

This section details the preparation of the data and the process of plausibility checks. Furthermore, it shows how reliability and validity were ensured and describes how a factor analysis was performed.

### **3.5.1 Data Preparation**

After the data were collected ( $n = 1,306$ ), they were processed accordingly. This included the coding, cleaning, and transformation of the numerical variable values. This was done with the help of the statistical software IBM SPSS Statistics, where the Excel file generated from UNIPARK with the data was imported into the software and thus prepared accordingly. The goal of data preparation is to guarantee high-quality data. This can be guaranteed, for example, if the questionnaire is fully completed, if missing values are treated accordingly, and if the answers appear plausible (Döring; Bortz 2016, p. 584 f). To guarantee the completeness of the questionnaire and avoid missing answers, the mandatory answer function was activated for each question so that the questionnaire could only be sent if it was completed. With regard to the plausibility of the questions, a plausibility check was performed, which is described in detail in the following section.

### **3.5.2 Plausibility Checks**

Questionnaires are sometimes not filled out seriously, or implausible answers are given. This would be the case, for example, if respondents always clicked the same middle box for each question or completed the questionnaire too quickly. For this reason, data must be checked for plausibility after they have been collected (Döring; Bortz 2016, p. 590).

Accordingly, criteria are defined to identify implausible answers. First, answers are classified as implausible if the participants always choose the same answer option or tend to choose the middle option (click-through). Furthermore, control questions are included to uncover contradictory answers. The following additional criteria were defined for this purpose:

- The values for the items IR1\_AT1 and IR2\_AT2<sup>17</sup> must not contradict each other.
- The values for the items IR7\_PBC1 and IR9\_PBC3<sup>18</sup> must not contradict each other.
- The values for the items IR4\_SN1 and IR5\_SN2<sup>19</sup> must not contradict each other.

Responses were classified as implausible if more than one control question was answered inconsistently.

As a further criterion, the time taken to complete the questionnaire provides information about possible implausible responses. To avoid outliers, the middle processing time of the questionnaire (median) was taken as a reference value. Respondents who completed the questionnaire in less than 50% of the median processing time were classified as implausible. For example, the median in the South African sample was 402 seconds (6m 42s). Consequently, responses that were answered in less than 201 seconds (3m 21s) were classified as implausible. The German sample's median was 293 seconds (4m 53s). Questionnaires completed in less than 147 seconds (2m 17s) were identified as implausible.

All criteria were defined as rules using SPSS to identify implausible responses as efficiently as possible. Subsequently, the corresponding responses were manually screened, and 11 were removed from the sample.

### **3.5.3 Ensuring Reliability and Validity**

After the data have been processed, it is necessary to determine whether reliability and validity can be ensured. For this purpose, standard methods such as the exploratory factor analysis and Cronbach's alpha are applied (Hornburg; Giering 1996, p. 8).

Exploratory factor analysis was performed using SPSS. The purpose of this analysis is to reduce the number of correlating variables to a smaller number of factors (components) and to structure the data to identify dependencies between the correlating variables (Backhaus et al. 2021, p. 414). For this purpose, the principal component analysis<sup>20</sup> was used as the extraction method, and the Varimax rotation was selected.

The factor analysis was performed first for the independent variables. For this purpose, the number of factors to be generated was not preset, and seven components were automatically generated. Thereupon, two criteria were used to check whether the factor analysis was. First, the Kaiser-Meyer-Olking value (KMO value) was used, providing information on whether the data set was suitable for the factor analysis. This value can be a maximum of 1.0 and should usually be greater than 0.5. For the present study, the KMO value was 0.948, which is considered marvellous and is thus suitable for a factor analysis. Second, the Bartlett test was applied to check whether the items correlated strongly enough with each other so that the

<sup>17</sup> I like the idea of buying recycled products & I think it's a good idea to buy recycled products.

<sup>18</sup> I know where to buy recycled products & I find recycled products to be easily accessible.

<sup>19</sup> People I care about think I should buy recycled products & People I care about would want me to buy recycled products.

<sup>20</sup> Principal Component Analysis is actually distinguished from Factor Analysis because they are based on different theoretical models. However, both analyses involve the same steps and often produce very similar results. In SPSS, Critical Component Analysis is therefore already preset as the extraction method for factor analysis. (Backhaus et al. 2021, p. 436)

factor analysis could be performed. The Bartlett test in the present study proved to be highly significant (.000); hence, it was suitable according to this criterion (Backhaus et al. 2021, p. 422 f.).

Rotated Component Matrix Components							
Items	Uncertainty	Attitude / Environmental Concern	Promotion / Certification	Value / Accessibility	Subjective Norm	Price	Buying Effort
IR1_AT1	-0.270	0.537	0.232	0.351	0.233	0.208	0.184
IR1_AT2	-0.363	0.543	0.236	0.321	0.192	0.112	0.184
IR1_AT3	-0.322	0.542	0.203	0.384	0.177	0.086	0.187
IR4_SN1	0.033	0.215	0.141	0.295	0.741	0.088	0.033
IR4_SN2	-0.001	0.239	0.190	0.225	0.755	0.120	0.054
IR4_SN3	-0.041	0.307	0.215	0.200	0.713	0.061	0.091
IR7_PBC1	0.048	0.106	0.134	0.703	0.195	0.168	-0.254
IR8_PBC2	0.239	0.010	0.116	0.584	0.161	0.068	-0.170
IR8_PBC3	0.095	0.047	0.170	0.711	0.205	0.112	-0.276
IR9_EC1	-0.120	0.747	0.244	-0.011	0.134	0.093	-0.010
IR10_EC2	-0.054	0.751	0.208	-0.022	0.164	0.115	-0.023
IR11_EC3	-0.151	0.777	0.264	0.041	0.121	0.065	-0.040
IR12_PR1	0.766	-0.028	0.020	-0.150	0.017	-0.178	0.006
IR13_PR2	0.793	-0.001	0.006	-0.100	0.000	-0.178	0.023
IR14_PR3	0.774	-0.161	-0.119	-0.068	-0.056	-0.028	0.043
IR15_PR4	0.739	-0.030	0.075	-0.021	0.052	-0.086	0.042
IR16_PR5	0.708	-0.100	0.027	0.118	0.019	0.046	0.182
IR17_PR6	0.763	-0.210	-0.068	-0.075	0.001	-0.015	-0.003
IR19_PV1	-0.286	0.416	0.201	0.481	0.244	0.125	0.226
IR19_PV2	0.037	0.104	0.342	0.429	0.322	-0.100	0.253
IR19_PV3	-0.243	0.374	0.175	0.430	0.343	0.178	0.235
IR22_PCE1	0.549	-0.045	-0.215	0.263	-0.182	-0.033	0.198
IR22_PCE2	0.514	0.074	-0.091	0.295	-0.291	-0.125	0.174
IR22_PCE3	0.221	-0.558	-0.336	-0.191	-0.236	-0.100	-0.077
PR1_P1	0.219	0.072	0.178	0.277	0.236	0.680	0.021
PR2_P2	-0.298	0.078	-0.113	-0.108	-0.042	0.590	-0.230
PR3_P3	-0.172	0.251	0.183	0.174	0.087	0.621	0.097
PR4_QF1	-0.316	0.277	0.283	0.417	0.174	0.383	0.183
PR5_QF2	-0.283	0.188	0.103	<b>0.402</b>	0.131	<b>0.447</b>	0.239
PR6_QF3	0.734	-0.217	-0.075	0.099	-0.018	0.012	0.090
PR7_QF4	0.745	-0.274	-0.102	0.066	0.030	0.058	0.113
PR8_C1	-0.099	0.245	0.581	0.240	0.315	0.167	-0.008
PR9_C2	-0.106	0.300	0.558	0.180	0.337	0.279	0.051
PR10_C3	-0.045	0.244	0.533	0.166	0.322	0.261	-0.010
CR1_D1	0.211	0.085	0.186	0.002	0.191	0.161	0.604
CR2_D2	0.386	-0.007	-0.004	-0.222	-0.015	-0.078	0.631
CR3_D3	0.184	0.065	0.229	-0.160	0.011	-0.058	0.674
CR4_P1	-0.113	0.239	0.799	0.085	0.047	-0.012	0.125
CR5_P2	-0.032	0.270	0.770	0.107	0.082	0.048	0.102
CR6_P3	0.015	0.208	0.762	0.110	0.080	-0.007	0.167

Table 5: Factor Analysis, Rotated Component Matrix

Source: own illustration based on results

To determine how the items fit the selected components, the factor loadings were observed (Döring; Bortz 2016, p. 482). The various constructs were allocated to the respective components with the highest factor loading and were thus grouped. Subsequently, a suitable collective term was defined for each component. Consequently, the collective term for component 1 was "Uncertainty", for component 2 it was "Attitude / Environmental Concern", for component 3 it was "Promotion / Certification", for component 4 it was "Value / Accessibility", for component 5 it was "Subjective Norm", for component 6 it was "Price", and finally for component 7 it was "Buying Effort". Due to their factor loadings, the constructs could be clearly assigned to the respective components. Item PR5\_QF2 was an exception, as it had a higher factor loading on component 6, but due to its meaning it could be better assigned to component 4. The corresponding excerpts from SPSS can be found in Appendix H and Appendix I.

As a second step, a factor analysis was performed for the dependent variable purchase intention. The factor analysis had a KMO value of 0.714 and a Bartlett test of (.000). As a result, all three items measuring purchase intention were loaded onto the "purchase intention" factor.

Rotated Component Matrix Components	
Items	Purchase Intention
DV3_PI1	0.894
DV4_PI2	0.894
DV5_PI3	0.837

Figure 7: Factor Analysis, Rotated Component Matrix (Purchase Intention)  
Source: own illustration based on results

Again, the SPSS excerpts can be found in the Appendix J and Appendix K.

Furthermore, Cronbach's Alpha, the most frequently used reliability coefficient, was employed to examine the measurement accuracy. The values can range from 0 to 1, while a value of at least 0.7 should be achieved (Hornburg; Giering 1996, p. 8). For the present study, all items were tested using SPSS and a Cronbach's alpha of 0.849 was determined, which indicates good reliability. The relevant excerpt from SPSS can be found in Appendix L.

### 3.6 Adjusted Research Model

Due to the factor analysis revealing factors other than those originally intended for investigation, the research model was adapted accordingly. Originally, there were 13 factors to test the influence on purchase intention for recycled products based on hypotheses 1 to 13. However, the factor analysis bundled some of these into one factor, so the influence of seven factors was examined in total.

The factors *perceived risk* (H4), *perceived consumer effectiveness* (H7) and part of *quality and functionalities* (H11) were combined in the factor "Uncertainty". Accordingly, hypotheses 4, 7, and 11 were replaced by the following hypothesis:

*H1: Uncertainty has a negative influence on purchase intention for recycled products.*

The factors *attitude* (H1) and *environmental concern* (H6) were also combined, resulting in the factor “Attitude / Environmental Concern”. The following new hypothesis was created to replace the original hypotheses 1 and 6:

*H2: Attitude / Environmental Concern has a positive influence on purchase intention for recycled products.*

Similarly, the factors *certification* (H9) and *promotion* (H13) were combined into the new factor “Promotion / Certification”. Accordingly, the original hypotheses 9 and 13 were replaced by the following hypothesis:

*H3: Promotion / Certification have a positive influence on purchase intention for recycled products.*

The factors *perceived behavioral control* (H3), *perceived value* (H5), and part of *quality and functionalities* (H10) were also combined. The original hypotheses 3, 5, and 10 were thus replaced with the following:

*H4: Value / Accessibility have a positive influence on the purchase intention of recycled products.*

*Subjective norm* remained a single factor to be considered, so only a change in numbering was necessary. Thus, the original hypothesis 2 was transformed into the following:

*H5: Subjective Norm has a positive influence on purchase intention for recycled products.*

Similarly, the factor *price* was retained as a single factor, so only a change in the numbering was required. Hence, the following hypothesis replaced the original hypothesis 8:

*H6: A price lower than that of new/conventional products has a positive influence on purchase intention for recycled products.*

For the seventh factor, the factor *availability* was renamed “Buying Effort”. Accordingly, the original hypothesis 12 was replaced as follows:

*H7: Buying Effort has a negative influence on purchase intention for recycled products.*

There were no changes in the original hypotheses 14, 15, 16, and 17. However, these were also renumbered to hypotheses 8, 9, 10, and 11. For the sake of completeness, the hypotheses are listed below:

*H8: The purchase intention for recycled products differs in terms of different product types.*

*H9: There is a gap between the intention to buy recycled products and actual behavior.*

*H10: The intention-behavior gap differs for different product types.*

*H11: The influencing factors of purchase intentions for recycled products differ between Germany and South Africa.*

Thus, the original model with 17 hypotheses was replaced by a new model with 11 hypotheses, as shown in the following figure. The testing of these hypotheses is described later in this paper.

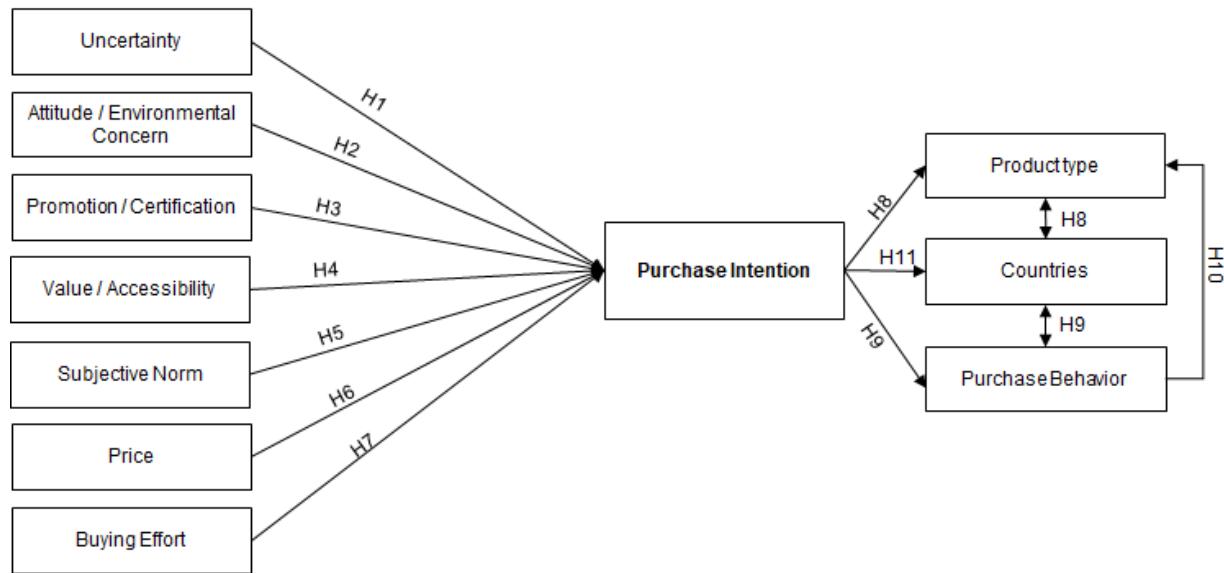


Figure 8: Adjusted Research Model, Summary of Final Hypotheses  
Source: Own illustration

## 4 Results

The fourth chapter serves to first describe the sample. This includes both the overall and country-specific samples. This is followed by descriptive statistics where the mean values of the items are presented. Subsequently, the hypotheses are tested using a regression analysis, independent t-tests as well as cross-tabulations with chi-squared tests, and additional analyses are performed before a summary of the results is presented.

### 4.1 Sample

In this section, the targeted quotas are compared with the quotas that were actually reached. This comparison is followed by a more detailed description of the sample in general and for both countries.

#### 4.1.1 Targeted and Reached Quotas

As explained in the previous section, this research used non-probabilistic quota sampling. For this purpose, South Africa and Germany were divided into groups and, based on the available data, the quotas to be achieved were calculated, and these would ultimately represent the populations. The quotas to be achieved were defined in UNIPARK and then transmitted to the commercial panel provider, whose task was to fill the quotas using targeted recruiting.

Overall, the final sample size (n) was 1,295. The sample size was 692 for South Africa and 603 for Germany. An illustration of the planned versus reached quotas for South Africa and Germany is shown in Table 6.

Criteria	South Africa (n = 692)			Germany (n = 603)		
	Target in %	Reached in %	N	Target in %	Reached in %	N
<b>LSM 7</b>	30.00	28.32	196	-	-	-
<b>LSM 8</b>	23.33	22.54	156	-	-	-
<b>LSM 9</b>	20.00	20.81	144	-	-	-
<b>LSM 10</b>	26.67	28.32	196	-	-	-
<hr/>						
<b>Male</b>	-	33.38	231	48.93	50.58	305
<b>Female</b>	-	66.47	460	51.07	49.25	297
<b>Diverse / not specified</b>	-	0.14	1	-	0.17	1
<hr/>						
<b>18 – 24</b>	-	17.05	118	15.36	14.93	90
<b>25 – 34</b>	-	26.73	185	19.74	20.23	122
<b>35 – 49</b>	-	32.80	227	23.56	24.05	145
<b>50 – 64</b>	-	16.33	113	26.71	26.20	158
<b>65+</b>	-	7.08	49	14.63	14.59	88
<hr/>						
<b>Less than R 8,000 / Less than € 1,250</b>	-	22.83	159	8.88	8.46	51
<b>R 8,001 to 18,000 / € 1,250 to 2,000</b>	-	39.16	271	15.12	15.09	91
<b>R 18,001 to 37,000 / € 2,001 to 3,000</b>	-	28.32	196	22.13	21.72	131

R 37,001 to 63,000 / € 3,001 to 5,000	-	8.38	58	27.55	27.69	167
R 63,000 and more / € 5,001 and more	-	1.30	9	26.32	27.03	163

Table 6: Targeted and Reached Quotas for South Africa and Germany

Source: own illustration, based on the results

Since South Africa was only quoted by LSM groups, no influence on gender, age, and monthly household net income was taken into account. In general, the distributions were well balanced. The South African sample matches the LSM groups listed in Table 6, although minor differences exist with respect to South African population proportions. The sample contains more females (66.4%) than are in the population (51.1%) (South African Government n. y.). The LSM groups 6, 7, 8, and 9 are biased toward females, and in developing countries women shop more often than men, as shown by the fact that women "account for 59% of mall shoppers in South Africa" (Corbishley; Mason; Dobbelstein 2022, p. 52).

As far as Germany is concerned, all quotas were fulfilled. The only exception was that gender quotas were slightly higher for men than women. This is because the male quota had to be relaxed toward the end of the survey to fill the missing quotas "household income over € 5,000" and "age 65+" (i.e., there were no further women to fulfil these conditions).

#### 4.1.2 Overall

The final sample size was 1,295, of which 536 were male and 757 were female. Another two people fell into the category diverse/not specified. Most respondents were between 25 and 34 years old ( $n = 362$ ), followed by those aged 35 to 49 ( $n = 327$ ). The 65 and older group had the fewest respondents ( $n = 172$ ). Most respondents were in the middle-income bracket ( $n = 372$ ), and most participants reported having the highest level of education, namely a university degree or similar ( $n = 557$ ).

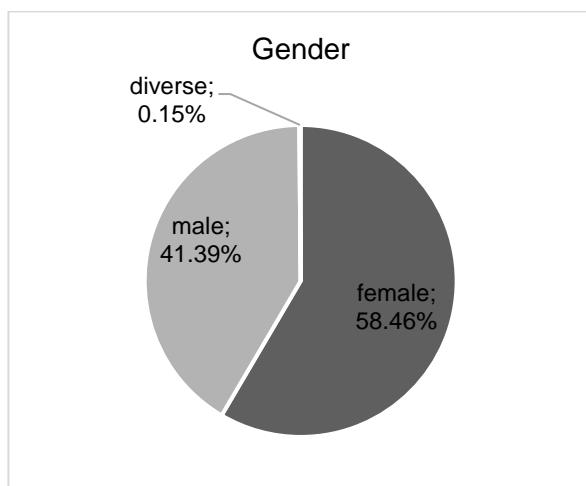


Figure 9: Overall Sample, Gender ( $n = 1,295$ )  
Source: own illustration based on results

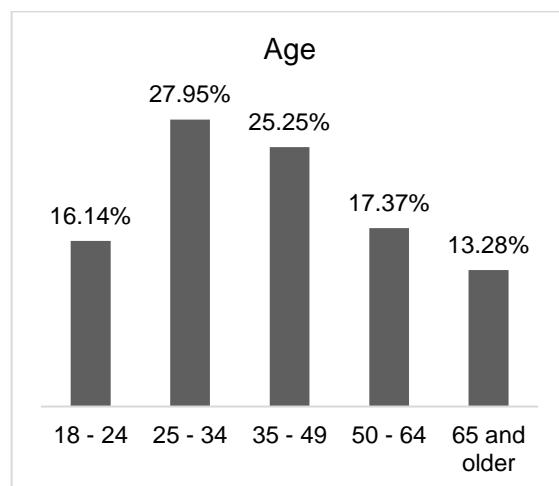


Figure 10: Overall Sample, Age ( $n = 1,295$ )  
Source: own illustration based on results

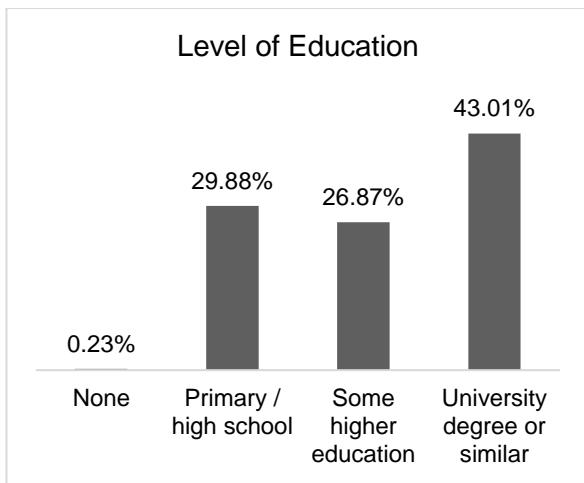


Figure 11: Overall Sample, Education (n = 1,295)  
Source: own illustration based on results

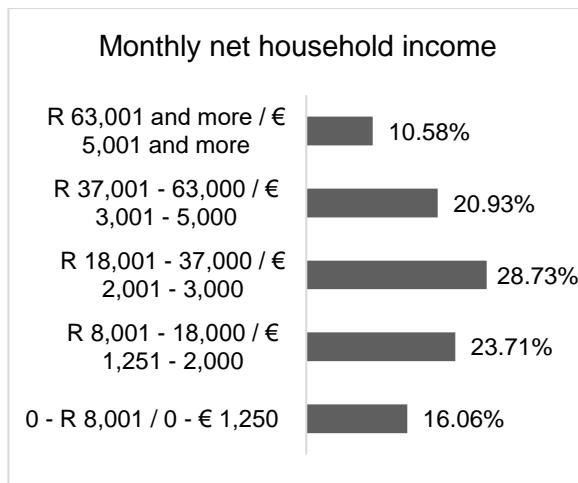


Figure 12: Overall Sample, Income (n = 1,295)  
Source: own illustration based on results

#### 4.1.3 South Africa

Of the total sample of 1,295, 692 people were in the South African sample. In South Africa, 231 men, 460 women, and one diverse/unspecified gender participated in the survey. Most respondents were between 25 and 49 years old (n = 271), and some were 65 years and older (n = 9). Most participants reported having a median net household income (n = 227), while most reported having a college degree or similar. (n = 415)

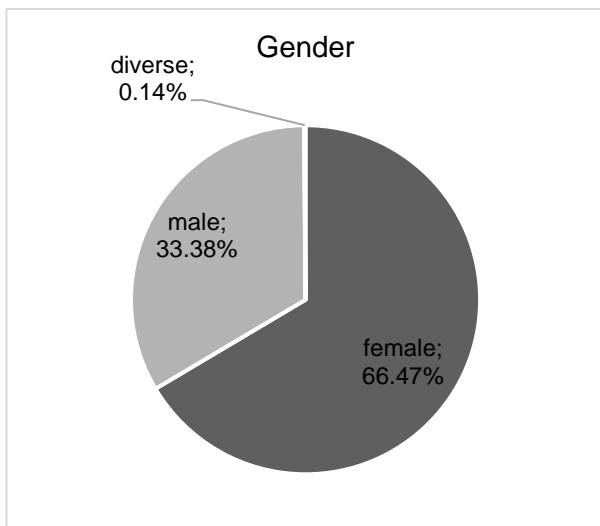


Figure 13: South Africa, Gender (n = 692)  
Source: own illustration based on results

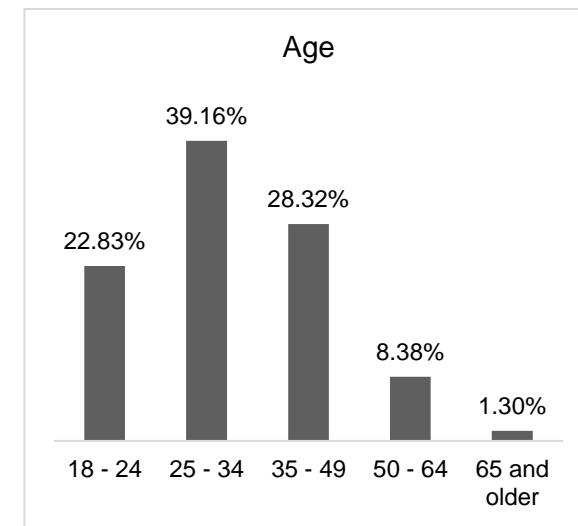


Figure 14: South Africa, Age (n = 692)  
Source: own illustration based on results

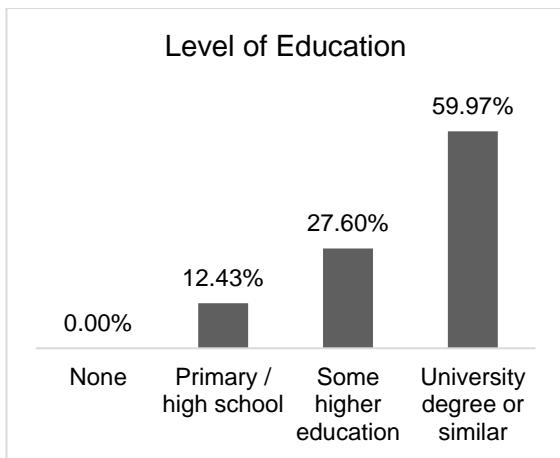


Figure 15: South Africa, Education (n = 692)  
Source: own illustration based on results

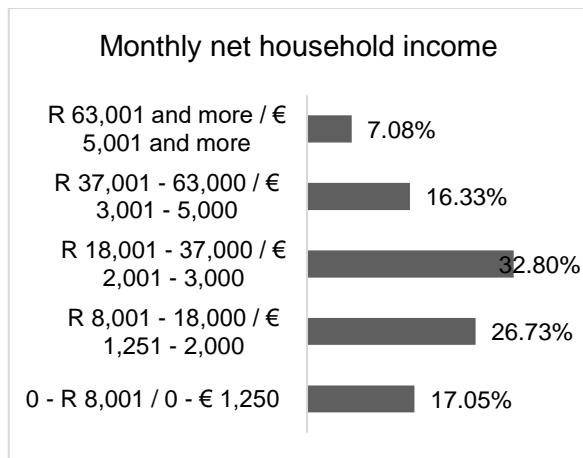


Figure 16: South Africa, Income (n = 692)  
Source: own illustration based on results

#### 4.1.4 Germany

Of the total sample of 1,295, the German sample included 603. In Germany, 305 men, 297 women, and one diverse/unspecified gender participated in the survey. Most participants were between 50 and 64 years old (n = 167), followed by those 65+ years old (n=163). Thus, the German sample was older on average than the South African one. Most participants reported having the second-highest household net income (n = 158) and the majority had a primary/high school diploma (n = 301).

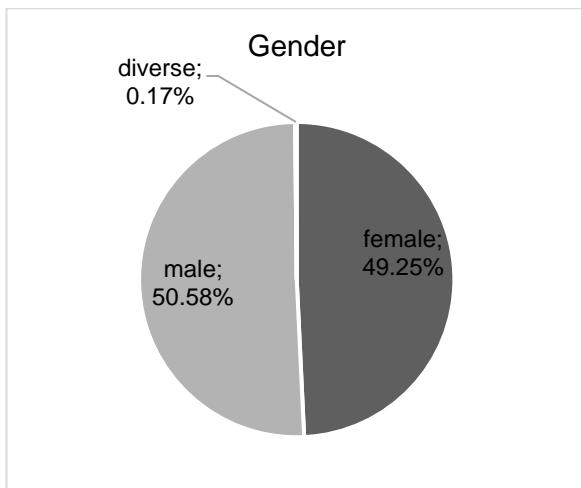


Figure 17: Germany, Gender (n = 603)  
Source: own illustration based on results

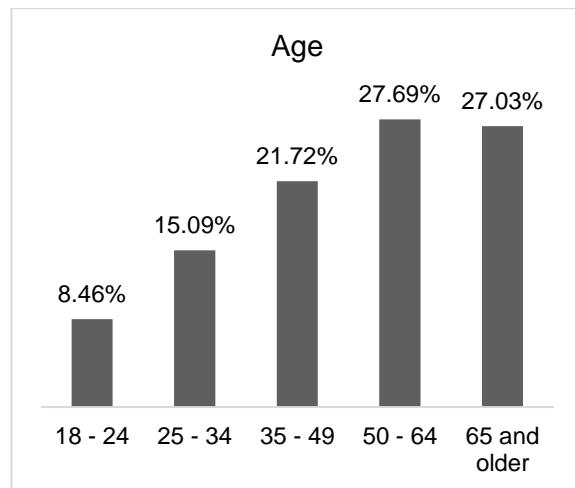


Figure 18: Germany, Age (n = 603)  
Source: own illustration based on results

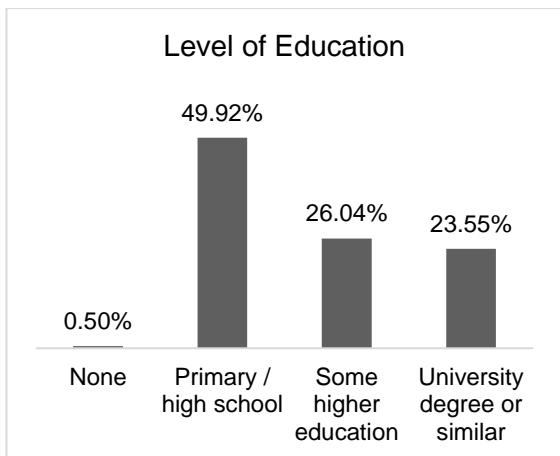


Figure 19: Germany, Education (n = 603)  
Source: own illustration based on results

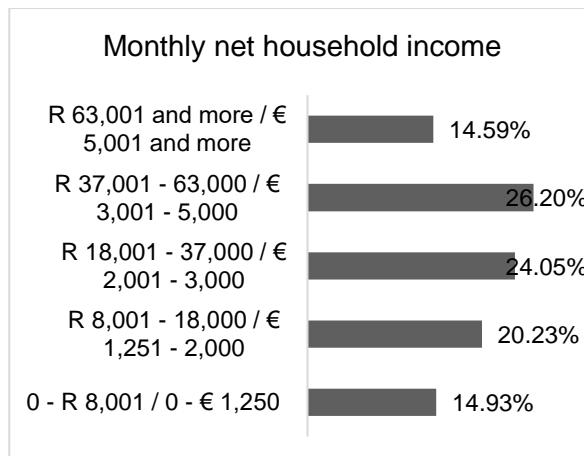


Figure 20: Germany, Income (n = 603)  
Source: own illustration based on results

## 4.2 Descriptive Statistics

The following table contains all the constructs and corresponding items and provides a descriptive overview of the tendencies of the overall sample and the respective countries based on mean values. A value of 1 can be interpreted as "strongly disagree" and a value of 7 as "strongly agree". An exception is the dependent variable "purchase behavior", where 1 should be interpreted as "all the time" and 7 as "never".

The table shows generally above-average mean values, which are mostly higher in the South African sample. The highest mean value was achieved by the samples of both countries for the question "I am concerned about the lasting damage that humans are inflicting on the environment", where the mean value in South Africa (6.29) was higher than in Germany (5.82). The exceptions are the mean values for the construct *perceived risk* and *quality and functionalities* which were average to below average with values lower than 3.61 to 2.28, which means that the samples tend to see less risk in buying recycled products and tend to perceive them less as disgusting/contaminated.

Factor	Construct	Item	Country	Mean	Std. Devia-tion	Total Mean
Uncertainty	Perceived Risk	I am afraid that the quality of recycled products is not as good as that of products with new/conventional materials.	SA	3.55	1.850	3.52
			GER	3.48	1.726	
		I am afraid that recycled products might not function as well as products with new/conventional materials.	SA	3.41	1.776	3.41
			GER	3.41	1.684	
		I am afraid that buying recycled products is not a good investment.	SA	2.80	1.643	2.96
			GER	3.12	1.707	
	I am afraid that I will have to return recycled products more frequently than products with new/conventional materials.	SA	3.68	1.775	3.61	
			GER	3.53	1.652	
		I am afraid that people I value disapprove of me when buying recycled products.	SA	2.74	1.801	2.66
			GER	2.58	1.703	
	It makes me feel uncomfortable when I think of buying recycled products.	SA	2.49	1.657	2.65	
			GER	2.81	1.780	
		There is not a lot that an individual can do to help solve environmental problems.	SA	3.38	2.115	3.56
Attitude / Environmental Concern	Perceived Consumer Effectiveness		GER	3.74	1.971	
		One person's efforts are meaningless as long as other people refuse to contribute to solving environmental problems.	SA	4.18	2.063	4.04
			GER	3.89	1.917	
	I feel that I can help solving environmental problems when buying recycled products.	SA	6.10	1.085	5.76	
			GER	5.42	1.385	
	Quality and functionalities (Contamination)	I think products made of recycled materials are contaminated.	SA	2.84	1.794	2.93
			GER	3.02	1.615	
	Attitude	In my opinion, products made of recycled materials are disgusting.	SA	2.28	1.697	2.40
			GER	2.52	1.615	
		I like the idea of buying recycled products.	SA	6.04	1.053	5.80
			GER	5.56	1.294	
		I think it's a good idea to buy recycled products.	SA	6.21	1.024	5.97

	Environmental Concern	I have a positive attitude towards recycled products.	GER	5.72	1.277	
			SA	6.16	1.084	5.93
			GER	5.70	1.283	
	I am concerned about the current environmental changes.	I am concerned about the long-term consequences of unsustainable behavior.	SA	6.19	1.131	5.96
			GER	5.73	1.416	
		I am concerned about the lasting damage that humans are inflicting on the environment.	SA	6.00	1.261	5.79
			GER	5.57	1.415	
	Certification	I trust eco-labels since they are a sign that the product is environmentally friendly.	SA	6.29	1.063	6.06
			GER	5.82	1.417	
		An eco-label on a recycled product encourages me in buying the product.	SA	5.79	1.195	5.35
			GER	4.91	1.479	
		An eco-label on a recycled product increases the credibility of the product.	SA	5.72	1.195	5.37
			GER	5.01	1.500	
Promotion / Certification	Promotion	Promotion can help me to find out more about recycled products.	SA	5.51	1.338	5.29
			GER	5.06	1.448	
		Promotion can help me learn about the environmental impact caused by buying products with new/conventional materials.	SA	6.03	1.084	5.52
			GER	5.00	1.560	
		The stronger the promotion, the higher my attention to recycled products.	SA	6.02	1.057	5.44
			GER	4.86	1.527	
		The stronger the promotion, the higher my attention to recycled products.	SA	5.82	1.246	5.19
			GER	4.55	1.629	
Value / Accessibility	Perceived Value	I consider recycled products to be of good value.	SA	5.90	1.111	5.66
			GER	5.41	1.286	
		Compared to products with new/conventional materials, recycled products have a better price-performance ratio.	SA	5.20	1.336	4.80
			GER	4.39	1.433	
		Recycled products will satisfy my wants and needs.	SA	5.56	1.215	5.37
			GER	5.17	1.312	

		Perceived Behavioral Control	I know where to buy recycled products.	SA	5.05	1.623	4.99
				GER	4.93	1.465	
		Quality and functionalities	Recycled products are easy to identify.	SA	4.59	1.714	4.51
				GER	4.42	1.438	
		Quality and functionalities	I find recycled products to be easily accessible.	SA	5.03	1.626	4.92
				GER	4.80	1.375	
Subjective Norm		Subjective Norm	Recycled products are of good quality.	SA	5.59	1.163	5.43
				GER	5.27	1.237	
			Recycled products have a quality similar to that of products made of new/conventional materials.	SA	5.26	1.446	5.26
				GER	5.26	1.290	
		Price	People I care about think I should buy recycled products.	SA	5.17	1.481	4.93
				GER	4.68	1.500	
			People I care about would want me to buy recycled products.	SA	5.34	1.369	5.03
Buying Effort		Price	People whose opinions I value would appreciate me buying recycled products.	SA	5.57	1.323	5.22
				GER	4.86	1.422	
			I would pay more for a recycled product than for a product made of new/conventional materials.	SA	4.22	1.721	4.13
		Availability	I would pay less for a recycled product than for a product made of new/conventional materials.	SA	4.56	1.727	4.33
				GER	4.09	1.534	
			If the price of a recycled product was the same as the price of a product made of new/conventional materials, I would choose the recycled product.	SA	5.33	1.581	5.32
				GER	5.31	1.516	
		Availability	The lack of availability of recycled products affects my purchase intention.	SA	4.68	1.587	4.45
				GER	4.22	1.433	
			Recycled products are not sold in any stores close to where I live.	SA	3.91	1.851	3.88
				GER	3.84	1.571	
			In order to locate recycled products I have to research.	SA	5.13	1.529	4.75

			GER	4.37	1.512		
Dependent Variables	Purchase Behavior	In the past, how often have you bought a t-shirt made of recycled materials instead of new/conventional materials? (1 = all the time / 7 = never)	SA	4.34	1.762	4.48	
			GER	4.62	1.732		
			SA	5.27	1.897	5.37	
			GER	5.47	1.879		
			SA	3.81	2.138	3.56	
	Purchase Intention	In the past, how often have you bought toilet paper made of recycled materials instead of new/conventional materials? (1 = all the time / 7 = never)	GER	3.30	1.856		
			SA	4.24	1.387	4.04	
			GER	3.84	1.344		
			SA	5.97	1.054	5.62	
			GER	5.26	1.332		
	Purchase Intention (Product Types)	I am considering buying recycled products in the near future.	SA	5.99	1.114	5.52	
			GER	5.05	1.446		
		When I have to choose between a recycled and a product made of new/conventional materials, I will typically choose the recycled version.	SA	5.30	1.368	5.18	
		GER	5.05	1.409			
		I would consider buying a t-shirt made of recycled materials in the near future.	SA	5.90	1.178	5.37	
		GER	4.84	1.427			
		I would consider buying a mobile phone made of recycled materials at my next purchase.	SA	5.08	1.623	4.96	
		GER	4.36	1.580			
		I would consider buying toilet paper made of recycled materials in the near future.	SA	5.65	1.552	5.54	
		GER	5.43	1.622			

Table 7: Descriptive Statistics, Mean Values of all Items

Source: own illustration based on results

## 4.3 Testing of Hypotheses

This section describes how the previously developed hypotheses were tested by applying methods such as regression analysis, independent t-tests, cross-tabulations, and additional analyses. A summary of all hypotheses is also presented.

### 4.3.1 Factors Influencing Purchase Intentions (Regression Analysis)

Regression analysis is used when relationships between variables need to be explained (Backhaus et al. 2021, p. 62). Since the influence of several independent variables was to be examined in the present study, a multiple regression analysis was performed (Field 2009, p. 198). The aim was to ascertain the influence of the seven independent variables on the dependent variable purchase intention for recycled products in general and for Germany and South Africa respectively. The analysis results address the central research question "What factors influence purchase intention for recycled products and how do they differ between Germany and South Africa?". The regression analysis was performed once overall (for South Africa and Germany together) and separately for both countries.

For this purpose, some values are interpreted, and briefly explained in terms of their meaning. For example, the Adjusted R Square reveals how well (in %) the respective factor can explain the purchase intention. Furthermore, the ANOVA reveals whether the model as a whole is significant (Field 2009, p. 207).

To draw conclusions for whole populations, some assumptions have to be confirmed. For example, multicollinearity should not be perfect, which means that there should be no linear relationship or correlation between two variables (Field 2009, p. 221). Multicollinearity can be tested in SPSS by specifying the multicollinearity tolerance (Backhaus et al. 2021, p. 123). The value of the tolerance should be greater than 0.2 (O'brien 2007, p. 688).

Furthermore, homoscedasticity should exist, which means that the variance of the residuals is constant for all values of the predictor. If this is not the case, there is heteroscedasticity (Field 2009, p. 221). This can be tested with scatterplots. For this purpose, regression plots are created in SPSS, where \*ZRESID (the standardized residuals/errors) on the Y-axis are compared to \*ZPRED (the standardized predicted values of the dependent variable) on the X-axis (Field 2009, p. 229).

Furthermore, there should be no autocorrelation, which means that the correlation of two consecutive residuals is not equal to zero. This can be controlled using the Durbin-Watson test generated by SPSS. The results can range from 0 to 4, with a value of 2 meaning that the residuals are not correlated (Field 2009, p. 220 f).

Additionally, care should be taken to ensure that the residuals are normally distributed. This distribution can be read graphically through QQ or PP plots. For the present study PP plots were used, which were generated using SPSS (Backhaus et al. 2021, p. 119 f).

In the first regression analysis, the relationships of the seven factors regarding the purchase intention of recycled products *in general* was investigated. The Adjusted R Square gives a value of 0.688 which means that the model can explain 68.8% of the variance (Field 2009, p.

221). The Durbin-Watson test shows a value of 2.002, which is considered acceptable, and the ANOVA test showed a high significance of 0.000 for the model (Field 2009, p. 237). Furthermore, as the multicollinearity tolerance exceeds 0.2, there is slight heteroscedasticity and normally distributed error terms, as shown in the following graphs. The SPSS results are detailed in Appendix M and Appendix N.

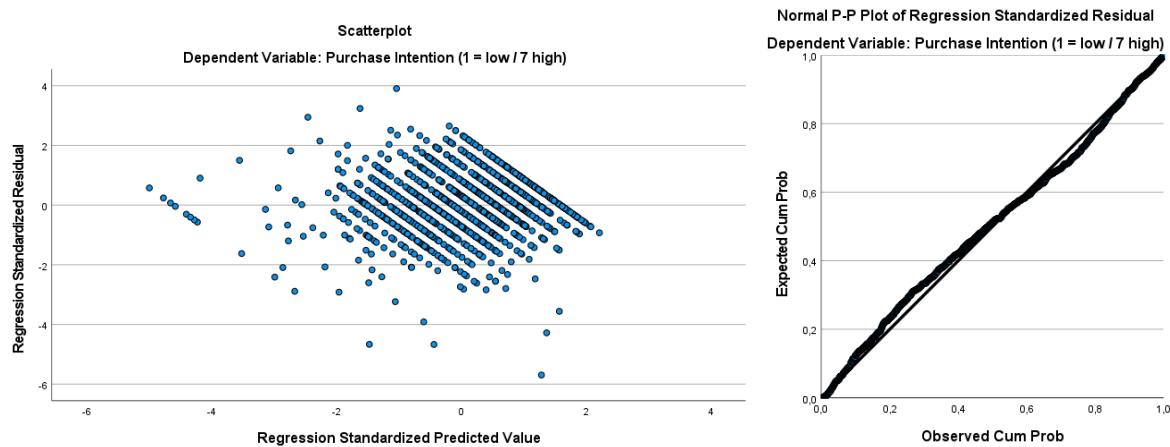


Figure 21: Scatterplot and PP Plot (overall)  
Source: illustration from SPSS, based on results

The second regression analysis examined the relationship between the seven factors and purchase intention for recycled products in *South Africa*. The Adjusted R Square value was 0.606, meaning 60.6% of the variance could be explained by the model. The Durbin Watson test was acceptable with a value of 2.070, and multicollinearity tolerance was >0.2. The scatterplot showed a slight violation of homoscedasticity, and normally distributed error terms were identified. Furthermore, the ANOVA test showed a high significance of <0.001. Again, the SPSS results can be found in Appendix P and Appendix Q.

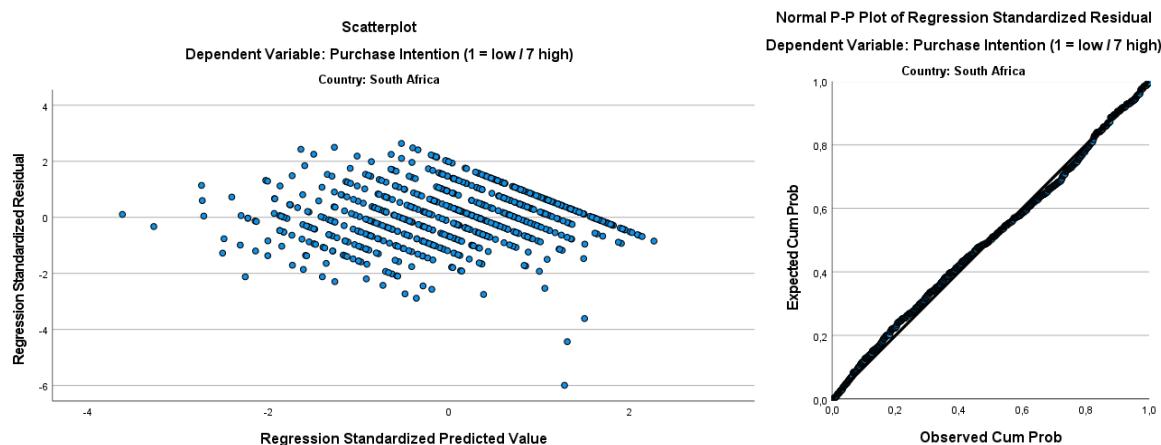


Figure 22: Scatterplot and PP Plot (South Africa)  
Source: illustration from SPSS, based on results

The third regression analysis investigated the relationship between the seven factors and purchase intention for recycled products in *Germany*. The Adjusted R Square was 0.716, meaning 71.6% of the variance could be explained by the model. The Durbin Watson test yielded 1.947, which is acceptable, while the ANOVA test yielded a high significance of <0.001. Again,

the multicollinearity tolerance was  $>0.2$ , and satisfying plots for heteroscedasticity and normally distributed error terms were examined. The SPSS results can be found in Appendix S and Appendix T.

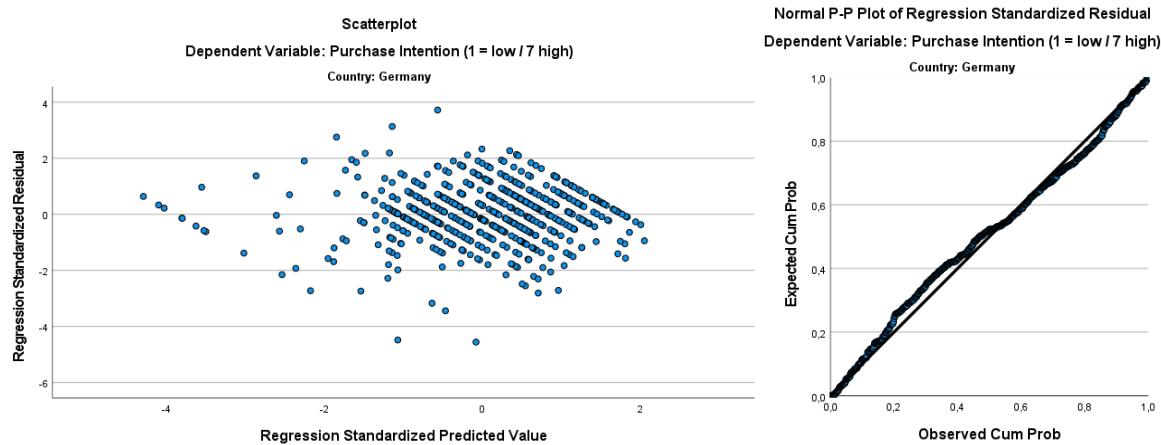


Figure 23: Scatterplot and PP Plot (Germany)  
Source: illustration from SPSS, based on results

Table 8 summarizes the results of the three regression analyses so that a better comparison can be made. The overviews of the individual regression analyses can be found in Appendix O, Appendix R, and Appendix U.

Factors	Overall			South Africa			Germany		
	Coeff. Beta <sup>21</sup>	Conf. Lower Bd. <sup>22</sup>	Conf. Upper Bd. <sup>23</sup>	Coeff. Beta	Conf. Lower Bd.	Conf. Upper Bd.	Coeff. Beta	Conf. Lower Bd.	Conf. Up- per Bd.
<b>Uncertainty</b>	-0.131**	-0.161	-0.088	-0.117**	-0.147	-0.051	-0.148**	-0.203	-0.090
<b>Attitude / En- vironmental Concern</b>	0.243**	0.231	0.348	0.247**	0.231	0.406	0.200**	0.139	0.307
<b>Promotion / Certification</b>	0.217**	0.179	0.272	0.213**	0.174	0.334	0.138**	0.078	0.208
<b>Value / Ac- cessibility</b>	0.203**	0.196	0.308	0.221**	0.167	0.311	0.226**	0.212	0.394
<b>Subjective Norm</b>	0.143**	0.091	0.166	0.097**	0.031	0.133	0.188**	0.120	0.231
<b>Price</b>	0.178**	0.143	0.213	0.200**	0.124	0.213	0.217**	0.180	0.298

<sup>21</sup> Abbreviation for Standardized Coefficients Beta

<sup>22</sup> Abbreviation for 95% Confidence Interval, Lower Bound

<sup>23</sup> Abbreviation for 95% Confidence Interval, Upper Bound

<b>Buying Effort</b>	0.060**	0.024	0.089	0.047	-0.004	0.080	0.071*	0.023	0.125
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Table 8: Summary of all Regression Analyses (Overall, South Africa, Germany)

Source: own illustration, based on results

\*\*highly significant, \*significant

The standardized coefficient beta provides information about the importance of each factor (Field 2009, p. 239). Thus, for the first regression analysis (overall), the factor "Attitude / Environmental Concern" (0.243) generally has the greatest influence on the purchase intention of recycled products, followed by "Promotion / Certification" (0.217), "Value / Accessibility" (0.203), "Price" (0.178) and "Subjective Norm" (0.143). "Uncertainty" (-0.131) also influences purchase intention, but the relationship is negative, so greater uncertainty has a negative impact on purchase intention. The factor "Buying Effort" (0.060) has the least influence on the purchase intention of recycled products.

The second regression analysis for South Africa shows that all factors except "Buying Effort" (0.047) have a high significance. According to the standardized coefficient beta, the factor "Attitude / Environment" (0.247) has the greatest influence on the purchase intention of recycled products, followed by "Value / Accessibility" (0.221), "Promotion / Certification" (0.213), "Price" (0.200), "Uncertainty" (-0.117) and "Subjective Norm" (0.097).

The results of the third regression analysis for Germany show that all factors are highly significant, and the "Buying Effort" (0.071) factor is just within the significant range. Unlike in South Africa, in Germany the factor "Value / Accessibility" (0.226) has the greatest influence on purchase intention for recycled products, followed by "Price" (0.217), "Attitude / Environment" (0.200), "Subjective Norm" (0.188), "Uncertainty" (-0.148), "Promotion / Certification" (0.138), and "Buying Effort" (0.071).

The influence of the individual factors on the intention to purchase recycled products differs between the two countries. In South Africa, for example, "Attitude / Environmental Concern" (0.247) has the greatest influence on purchase intention for recycled products, while in Germany the most influential factor is "Value / Accessibility" (0.226). Furthermore, "Promotion / Certification" has more influence on the purchase intention in South Africa (0.213) than in Germany (0.138), while the factor "Uncertainty" has more influence in Germany (-0.148) than in South Africa (-0.117). However, the confidence intervals for all seven factors overlap, which means that the differences between the countries are not significant.

#### 4.3.2 Differences in Purchase Intention (t-test)

For hypothesis 11, it was necessary to test whether there was a difference in purchase intentions for recycled products between South Africa and Germany. Hence, an independent t-test was conducted - independent because the two countries are independent groups tested for significant differences (Field 2009, p. 334).

As shown in the table below, the South African sample with a mean of 5.75 tends to have a higher purchase intention for recycled products than the German sample with a mean of 5.12.

Country	N	Mean	Standard Deviation
South Africa	692	5.7543	0.99896
Germany	603	5.1216	1.24942

Table 9: Independent t-test, Differences in Purchase Intention

Source: own illustration based on results

However, it still needs to be tested whether this is a significant difference. For this purpose, Levene's test for equality of variances was first performed. The Levene's test had to be considered in the table generated by SPSS for the independent t-test. Here, a distinction is made between "equal variances assumed" and "equal variances not assumed". If Levene's test is significant with a value of  $\leq 0.05$ , the null hypothesis can be rejected, and the "equal variances not assumed" row can be interpreted instead. If Levene's test is not significant with a value of  $> 0.05$ , the statistics in the "equal variances assumed" series can be read. (Field 2009, p. 340)

In the present study, Levene's test for equality of variances is significant with a value of  $< 0.001$ , so the null hypothesis is rejected, and the t-test is considered highly significant with a value of  $< 0.001$  and a confidence interval of 95%. Hence, the purchase intention for recycled products is significantly higher in South Africa than in Germany. The SPSS results are detailed in Appendix V and Appendix W.

#### 4.3.3 Differences of Purchase Intention between Product Types (t-test)

The next step was to test hypothesis 14 to answer the first subquestion "How do purchase intentions differ with regard to different product types and does a difference exist between Germany and South Africa? An independent t-test was used to test this hypothesis.

Generally speaking, there is no significant difference in purchase intentions with regard to t-shirts and toilet paper made from recycled materials. Considering the confidence interval, the significance is only seen for mobile phones. Hence, a difference in purchase intentions for different product types is identified for mobile phones only.

Product Type	Mean Difference	Conf. Lower Bd. <sup>24</sup>	Conf. Upper Bd. <sup>25</sup>
T-shirt	5.408	5.33	5.48
Mobile phone	4.749	4.66	4.84
Toilet paper	5.547	5.46	5.63

Table 10: Independent t-test, Differences in Product Types

Source: own illustration based on results

Considering the mean value of the South African and German samples, it is clear that people in South Africa tend to have greater purchase intentions for all three product types than people in Germany. However, a highly significant difference between the two countries could only be identified for t-shirts. Hence, the null hypothesis (variances are equal) was rejected in the Levene's test of variance equality (since the value is less than 0.05) and the significance (2-

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<sup>24</sup> Abbreviation for 95% Confidence Interval of the Difference, Lower Bound

<sup>25</sup> Abbreviation for 95% Confidence Interval of the Difference, Upper Bound

tailed) was examined. The difference in the mean is 1.058 and lies with a 95% probability in the population between 0.914 and 1.202. As the Levene's test for the product types mobile phone and toilet paper has a significance value greater than 0.05, the null hypothesis is not rejected, resulting in a non-significant difference between these two product types in relation to the countries. The SPSS results are shown in Appendix X, Appendix Y, Appendix Z and Appendix AA.

Product Type	Country	Mean	Significant Difference	Mean Difference	Conf. Lower Bd.	Conf. Upper Bd.
T-shirt	SA	5.90	Yes (<0.001)	1.058	0.914	1.202
	GER	4.84		1.058	0.914	1.202
Mobile phone	SA	5.08	No (0.217)	0.719	0.544	0.894
	GER	4.36		0.719	0.544	0.894
Toilet paper	SA	5.65	No (0.170)	0.211	0.038	0.385
	GER	5.43		0.211	0.038	0.385

Table 11: Independent t-test, Differences in Product Types (and Countries)

Source: own illustration based on results

#### 4.3.4 Differences in Intention-Behavior Gap (Cross-tabulation)

The second subquestion is "What influence does the intention-behavior gap have on the purchase intention of recycled products in Germany and South Africa?". To address this, hypotheses 15 and 16 were formulated to test whether a difference exists between the different product types. The intention-behavior gap is examined descriptively using a cross-tabulation.

To determine the intention-behavior gap, a positive purchase intention must be compared with a negative purchase behavior. For this purpose, a definition must first be made as to when the purchase intention is positive and when a behavior is classified as negative. Since no existing literature could provide a definition for this was found, it was decided that, in the context of the present study, a positive (strong) purchase intention exists when the mean value is greater than or equal to 6 (agree and strongly agree to purchase in the future). In contrast, negative (weak) purchase behavior is evident when the mean value is less than or equal to 3 (bought occasionally or less).

A general cross-tabulation was performed in general (South Africa and Germany) and was then executed separately for the two countries. First, those responses with a strong purchase intention were identified. From these responses, those with weak purchase behavior were determined so that the gap could be calculated. Concerning the three product types examined, the intention-behavior gap was largest for the mobile phone, followed by the t-shirt. A relatively small intention-behavior gap exists for toilet paper. This means that at least 82% of people with a strong purchase intention have bought toilet paper made from recycled materials in the past.

Product type	N strong purchase intention	N weak purchase behavior	Gap in %
T-Shirt	708	250	35.31
Mobile phone	481	238	49.48
Toilet paper	805	140	17.39

Table 12: Cross-tabulation, Differences in the Intention-Behavior Gap

Source: own illustration based on results

With regard to the two countries, the intention-behavior gap is largest in South Africa. While the intention-behavior gap for t-shirts is 40% in South Africa, it is 23% in Germany<sup>26</sup>. For mobile phones and toilet paper, the gap in South Africa is also considerably larger than for Germany.

Product type	South Africa			Germany		
	N strong purchase intention	N weak purchase behavior	Gap in %	N strong purchase intention	N weak purchase behavior	Gap in %
T-shirt	497	200	40.24%	211	50	23.70%
Mobile phone	331	179	54.08%	150	59	39.33%
Toilet paper	460	114	24.78%	345	26	7.54%

Table 13: Cross-tabulation, Differences in the Intention-Behavior Gap (and Countries)

Source: own illustration based on results

#### 4.3.5 Country-Specific Target Groups (Cross-tabulation and Chi-squared test)

A final cross-tabulation was made to answer the third subquestion "Which target groups can be identified for Germany and South Africa?". For this purpose, the demographic data was first considered for South Africa and Germany together, and the target groups were then examined on a country-specific basis. Again, a high purchase intention is present when the mean is greater than or equal to six. For this analysis, the requirements for the chi-square test were fulfilled with the exception of age in South Africa.

For this purpose, the gender "diverse" (two respondents) and level of education "none" (three respondents) had to be removed from the total sample. Finally, the sample size was adjusted from 1,295 to 1,290. From the adjusted total sample, 563 respondents fell into the strong purchase intention category, which is 43.64% of the total. At 53%, every second respondent in South Africa has a strong purchase intention, compared to 32.9% in Germany.

In the general sample (South Africa and Germany), the strong purchase intention for recycled products is somewhat more pronounced among women than men, although this difference is not significant. The strong purchase intention differs significantly between age groups. In the 25 to 49 age group, almost 50% have a strong intention to purchase, whereas this intention decreases with increasing age and is lowest, with 31.8%, in the 65+ age group. Regarding income, the results are not significant, although a uniformly pronounced strong purchase intention was observed in the middle three income classes, while it is not as strong in the lowest and highest classes. With regard to education, the results show that the strong purchase intention significantly differs within the different levels. Hence, a strong purchase intention increases with the level of education.

In the South African sample, the results show no significant differences for gender, age groups, income, or level of education. However, more men (56.7%) than women (51.1%) stated a strong purchase intention, no enormous differences within the age groups could be

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<sup>26</sup> the smaller the gap (%), the better

identified, and a strong purchase intention tends to increase with higher income but reduces in the highest income level. A strong purchase intention also tends to increase with the level of education but only minimally.

The German sample shows no significant differences in gender, age groups and income. However, the results are highly significant regarding the level of education, where a strong purchase intention is more likely with a higher level of education such as a university degree or similar (41.5%) compared to a lower level of education such as primary/high school (26.0%). Although no significant differences exist, only 22% of 25 to 49 year-olds stated a strong purchase intention for recycled products, which is very low compared to the other age groups. In terms of income, those in the middle-income bracket stated to had strongest purchase intention.

The SPSS results can be found in Appendix BB and Appendix CC.

<b>Demogra-phics</b>	<b>Description</b>	<b>Strong Purchase Intention Overall</b>	<b>Strong Purchase Intention SA</b>	<b>Strong Purchase Intention GER</b>
<b>Gender</b>	Male	41.8%	56.7%	30.4%
	Female	45.0%	51.1%	35.5%
	Diverse	-	-	-
<b>Age</b>	18 – 24	43.0%	49.7%	22.0%
	25 – 34	49.6%	53.9%	36.7%
	35 – 49	47.4%	54.1%	37.4%
	50 – 64	38.2%	53.4%	32.9%
	65+	31.8%	55.6%	30.4%
<b>Monthly household net income</b>	0 – R 8,000 / 0 - € 1,250	39.0%	47.9%	27.3%
	R 8,001 – 18,000 / € 1,250 – 2,000	44.0%	53.0%	30.3%
	R 18,001 – 37,000 / € 2,001 – 3,000	46.6%	52.4%	37.5%
	R 37,001 – 63,000 / € 3,001 – 5,000	44.8%	60.2%	33.8%
	More than R 63,000 / more than € 5,001	39.4%	51.0%	33.0%
<b>Highest le-vel of edu-cation</b>	None	-	-	-
	Primary / high school	31.1%	48.8%	26.0%
	Some higher education	46.1%	52.6%	38.2%
	University degree or similar	50.8%	54.0%	41.5%

Table 14: Overview of Sample with strong Purchase Intention

Source: own illustration based on results

#### 4.3.6 Country-Specific Differences in Influencing Factors (t-test)

Independently of the tested hypotheses, it is insightful to undertake further analyses regarding the factors to obtain insights that could be helpful in the discussion of the results.

Therefore, an independent t-test was used to discover the mean values in the respective countries and whether these differences are significant.

Concerning the factor “Uncertainty”, the mean value in South Africa is 3.02 and in 3.15 in Germany. Although Germany tends to be more risk-averse than South Africa (Hofstede Insights n. y.), the differences in this factor are not significant. However, in the factor “Attitude / Environmental Concern”, there is a significant difference between the countries. The mean

value in South Africa is 6.15, while it is 5.68 in Germany. Thus, attitude and concern for the environment is higher in South Africa. The mean value for the factor "Promotion / Certification" is also higher in South Africa (5.82) than in Germany (4.90). This is a significant difference, indicating that South Africans are more likely than Germans to rate promotion and certification as important. Although the mean for the "Value / Accessibility" factor is slightly higher in South Africa (5.27) than in Germany (4.96), the differences are not significant. There is a significant difference in the factor "Subjective Norm", with the mean value 5.36 in South Africa and 4.75 in Germany. Regarding price, the mean is 4.32 in South Africa and 4.42 in Germany. The differences are not significant. The difference in the "Buying Effort" factor is not significant with regard to the countries. The mean is 4.57 in South Africa and 4.14 in Germany. The SPSS results can be found in Appendix DD.

Factor	Country	Mean	Sig.
Uncertainty	SA	3.02	n.s.
	GER	3.15	
Attitude / Environmental Concern	SA	6.15	<0.001
	GER	5.68	
Promotion / Certification	SA	5.81	<0.001
	GER	4.90	
Value / Accessibility	SA	5.27	n.s.
	GER	4.96	
Subjective Norm	SA	5.36	<0.001
	GER	4.75	
Price	SA	4.33	n.s.
	GER	4.42	
Buying Effort	SA	4.57	n.s.
	GER	4.14	

Table 15: Independent t-test of the Individual Factors

Source: own illustration based on results

#### 4.3.7 Summarized Results of Tested Hypotheses

This section presents a summary of all the hypothesis findings. In Table 16, the hypotheses are explained according to the adapted research model, and it is indicated whether they are supported.

H#	Description	Country	Supported
1	<i>Uncertainty has a negative influence on purchase intention for recycled products.</i>	Overall	yes
		South Africa	yes
		Germany	yes
2	<i>Attitude / Environmental concern has a positive influence on purchase intention for recycled products.</i>	Overall	yes
		South Africa	yes
		Germany	yes
3	<i>Promotion / Certification has a positive influence on purchase intention for recycled products.</i>	Overall	yes
		South Africa	yes
		Germany	yes
4	<i>Value / Accessibility has a positive influence on purchase intention for recycled products.</i>	Overall	yes
		South Africa	yes
		Germany	yes
5	<i>Subjective Norm has a positive influence on purchase intention for recycled products.</i>	Overall	yes
		South Africa	yes

		Germany	yes
6	<i>A price lower than that of new/conventional products has a positive influence on purchase intention for recycled products.</i>	Overall	yes
		South Africa	yes
		Germany	yes
		Overall	yes
7	<i>Buying Effort has a negative influence on purchase intention for recycled products.</i>	South Africa	no
		Germany	yes
		Overall	yes
		South Africa	yes
8	<i>The purchase intention for recycled products differs in terms of different product types.</i>	Germany	yes
		Overall	yes
		South Africa	yes
		Germany	yes
9	<i>There is a gap between the intention to buy recycled products and the actual behavior.</i>	Overall	no
		South Africa	no
		Germany	no
		Overall	no
10	<i>The intention-behavior gap differs for different product types.</i>	South Africa	no
		Germany	no
		Overall	no
		South Africa	no
11	<i>The influencing factors of purchase intentions for recycled products differ between Germany and South Africa.</i>	Germany	no
		Overall	no
		South Africa	no
		Germany	no

Table 16: Summary of Hypotheses

Source: own illustration based on results

## 5 Discussion and Implications

This chapter discusses the study findings and answers the research questions. Furthermore, it highlights practical implications.

### 5.1 Discussion of Empirical Results

The central research question of this study was to ascertain which factors influence purchase intention of recycled products and how these differ with regard to South Africa and Germany. As the results of the regression analysis show, all seven factors influence purchase intention for recycled products. A significant difference between the countries could not be identified, although the influence of some factors differs in its extent in the respective countries.

Furthermore, the purpose of this study was to determine whether there is a difference in purchase intention with regard to different product types and whether country-specific differences can be identified. As the results of the t-test show, it can be established both generally and between countries that purchase intention differs with regard to different product types.

A further objective was to discover whether there is an intention-behavior gap concerning recycled products and whether differences exist between the two countries and different product types. There were clear differences between the products and countries within the sample, but the results are not valid for the general population.

As a final point, target groups should be derived for both countries, where results show that generally purchase intention is strongest for people with university degree and aged 25 to 49.

The following four sections address the four research questions and discuss the results.

#### 5.1.1 Influencing Factors

To answer the central research question (**RQ**) “**What factors influence purchase intention for recycled products and how do they differ between Germany and South Africa?**”, Bigliardi et al.’s (2020) theoretical framework was used. Using the framework, the main factors influencing purchase intention for recycled products were divided into three blocks. Research economics required a reduction of constructs, so three additional publications were considered, and the factors mentioned most frequently were considered in the present research. This approach resulted in 12 factors, which were reduced to seven after a factor analysis. Within the scope of the present study, the following seven factors were identified, all of which have a significant influence on the purchase intention of recycled products: “Uncertainty”, “Attitude / Environmental Concern”, “Promotion / Certification”, “Value / Accessibility”, “Subjective Norm”, “Price”, “Buying Effort”. No significant difference was found between the two countries with regard to the factors influencing the intention to purchase recycled products. However, the factors vary in their influence in the respective countries, and significant differences were found in relation to individual factors. Each factor is discussed in more detail below.

No significant difference was observed between South Africa and Germany for the “Uncertainty” factor. Both countries show a below-average risk in buying products made from recycled materials. This is a noteworthy observation, as German culture is more likely to avoid

uncertainty than South Africa (Hofstede Insights n. y.). Concerning the purchase intention of recycled products, the study results show that “Uncertainty” has a negative but small influence compared to the other factors. Thus, uncertainty factors such as fear of lower quality, functionality or contamination appear to influence purchase intention for recycled products, but this influence is not strong compared to other factors. This result is in line with past studies where it was confirmed that the perceived lower quality of recycled products (Queiroz et al. 2021, p. 13) and the fear of contamination (Magnier; Mugge; Schoormans 2019, p. 94) have a negative influence on purchase intention for recycled products.

Regarding the factor “Attitude / Environmental Concern”, a significant difference was found between South Africa and Germany. In South Africa, people tend to be more concerned about the environment and have a more positive attitude toward recycled products than Germans. This fact is noteworthy, as it could be assumed that German consumers are more exposed than South Africans to issues such as sustainable development, circular economy, and recycling due to political initiatives. In addition, research has shown that the majority of German consumers already value sustainability aspects when buying new products and even boycott stores that do not have sustainable environmental policies, which is not the case in South Africa (Statista Global Consumer Survey (GCS) 2021, p. 4 f; Mkhize; Ellis 2020, p. 18). However, South Africa has to deal with more natural disasters than Germany (Bündnis Entwicklung Hilft 2022). For example, shortly before the present study’s survey was conducted, the country was hit by a devastating flood that claimed 400 lives (BBC 2022). This could be why the “Attitude / Environmental Concern” factor is stronger in South Africa than in Germany. As for the influence on purchase intention for recycled products, it can generally be said that “Attitude / Environmental Concern” has the greatest influence. This result is in line with past studies, which have found that attitude has the greatest influence on purchase intention (Wang et al. 2013, p. 866; Rausch; Kopplin 2020, p. 1). However, regarding differences between the countries, no significant difference was found, although the factor has a slightly greater influence in South Africa (greatest influence) than in Germany (third greatest influence).

Another significant difference between the two countries was found in the “Promotion / Certification” factor. For example, in South Africa, it is more important for recycled products to be labeled with eco-labels and advertised accordingly than in Germany. With regard to certificates, the difference could also be due to the fact that people in Germany are skeptical about eco-labels (Statista Global Consumer Survey (GCS) 2021, p. 4 f). In contrast, South African consumers often have difficulties identifying sustainable products (Struwig; Adendorff 2018, p. 163), which is why it can generally be assumed that an eco-label on the product or advertising with sustainable product characteristics supports the identification of sustainable products such as recycled products. Generally speaking, the “Promotion / Certification” factor has the second largest influence on purchase intention for recycled products. This result is consistent with previous studies confirming that certificates in the form of eco-labels (Harms; Linton 2015, p. 1) and promotion (Qu et al. 2018, p. 92) positively influence purchase intentions. However, no significant difference was found between the two countries, although the influence is greater in South Africa than in Germany.

The factor “Value / Accessibility” appears to be equally important in Germany and South Africa. Generally speaking, the factor has the third greatest influence on purchase intention for recycled products, and in Germany it has the greatest influence and thus appears to be even more

important than the factor “Attitude / Environmental Concern”. This result means that in Germany, the ease of purchasing recycled products (accessibility) and value/quality aspects have the greatest influence on purchase intentions. This finding is supported by previous studies confirming that perceived behavioral control (Xu et al. 2020, p. 1; Wang et al. 2018, p. 866) and perceived value (Chaturvedi; Kulshreshtha; Tripathi 2020, p. 1) influence purchase intention for green products.

Another significant difference between the two countries was found with regard to the factor “Subjective Norm”. However, in South Africa, society’s views of one’s behavior tend to be more important than in Germany. In general, the results of the present study show that the factor influences purchase intention for recycled products, which does not differ significantly between the two countries. Generally speaking, the factor significantly influences purchase intention for recycled products; hence, the result is in line with past studies (Park; Lin 2020, p. 626; Khor; Hazen 2016, p. 9).

No significant difference was found between the two countries with regard to the factor “Price”. This result suggests that both countries are likely to be unwilling to pay more for recycled products than for conventional products. This result is in line with past studies, where Joshi et al. (2015, p. 134) and Nguyen et al. (2018, p. 3619) found that the high price of green products reduces purchase intention. Thus, this factor influences purchase intention for recycled products, but this does not differ significantly within the countries.

For the factor “Buying Effort”, no significant difference was identified between the two countries. The factor has the least influence on purchase intention for recycled products in general. In South Africa, the factor is not significant, and in Germany it is moderately significant. In general, this finding means that the buying effort of recycled products has a minimal influence on purchase intention. This result differs from previous studies, which have found that the lack of availability of green products is a major reason for not buying them or negatively affects purchase intentions (Connell 2010, p. 279; Walia; Kumar; Negi 2019, p. 108; Nguyen; Nguyen; Hoang 2018, p. 9).

### 5.1.2 Product Types

To answer the first subquestion (**SQ1**) “**How does the purchase intention differ with regard to different product types and does a difference exist between Germany and South Africa?**”, three product types were initially selected for investigation. This approach followed Magnier et al., selecting goods from the product types textiles, durables, and FMCG. When specifying the products, further aspects were considered, such as ensuring that the products are available in both countries. Finally, t-shirts, mobile phones, and toilet paper were chosen for the study. The results confirm that there is a difference in purchase intention with regard to different products, particularly true for mobile phones, for which the purchase intention is significantly lower than for t-shirts and toilet paper. A difference was also found between the two countries. For example, the purchase intention for t-shirts is significantly greater in South Africa than in Germany.

The results of the present study show a general difference in purchase intention for different product types, but this only applies to mobile phones (durables), where purchase intention is lowest. There may be several reasons for this. For example, mobile phones differ from the

other two products in that they have a comparatively higher price and are not as readily available as t-shirts or toilet paper. For this reason, it could be that the barrier to trying something new is greater than for the other two products.

Looking at the two countries separately, the purchase intention for all three product types tended to be greater in South Africa than in Germany. However, a significant difference could only be found for t-shirts (textiles). This finding means that South Africans are more likely to purchase textiles made from recycled materials than Germans. In fact, concerning all three product types, purchase intention was highest for the textiles product group in South Africa, despite past studies showing that these can be perceived as unhygienic when they touch the skin (Meng; Leary 2019, p. 1).

A study from 2000 showed that consumers prefer to buy conventional toilet paper because it looks more visually appealing than recycled toilet paper (Hanyu et al. 2000, p. 177). However, the present study found a large purchase intention for toilet paper (FMCG) was found. This result could be because recycled toilet paper has now been available for a long time and people are more willing to purchase it because of its low price.

### 5.1.3 Intention-Behavior Gap

To answer the second subquestion (**SQ2**) “**Is there an intention-behavior gap for recycled products in Germany and South Africa?**”, respondents were first asked whether they intended to buy t-shirts, mobile phones, and toilet paper made of recycled materials in the future, or, whether they had already bought these products in the past. To determine the intention-behavior gap, it was analyzed how many of those with a strong intention to buy the products had never or only occasionally bought them in the past. Regarding the intention-behavior gap, a statement can only be made for the surveyed sample. Within the samples, an intention-behavior gap was found, and this was highest for mobile phones and lowest for toilet paper. Regarding country-specific differences, the intention-behavior gaps for all three products are larger in South Africa than in Germany.

In general, the gap for toilet paper was found to be the smallest. Of the people surveyed with a high purchase intention, 80% had bought recycled toilet paper in the past. In the case of t-shirts and mobile phones, 65% and 50%, respectively, of people with a high purchase intention stated that they had bought these products in the past.

Although South Africa generally has a higher purchase intention for recycled products than Germany, the intention-behavior gap is much larger in the South African sample. For example, only 65% of those with a high purchase intention said they had ever purchased recycled toilet paper in the past, compared to more than 90% in Germany.

The intention-behavior gap with regard to t-shirts is also noteworthy. In contrast to Germany, South Africa had a high purchase intention for t-shirts. However, in the South African sample, only 60% of respondents had bought a t-shirt made from recycled materials in the past, while in the German sample, the figure was already almost 80%. It would therefore be insightful to ascertain whether past experience influences purchase intention for recycled products and why the gap is so large in South Africa despite the high purchase intention.

A similar result was obtained for mobile phones, where only 45% of the South African sample and 60% of the German sample had purchased a phone made from recycled materials in the past.

#### **5.1.4 Target Groups**

Although no significant differences in factors influencing the purchase intention for recycled products were found between the two countries, purchase intention is significantly higher in South Africa than in Germany. However, little is known about the target groups, hence the third subquestion was (**SQ3**) “**Which target groups can be identified for Germany and South Africa?**”. Therefore, the target groups are based on respondents with a strong purchase intention.

##### **5.1.4.1 South Africa**

In South Africa, the purchase intention for recycled products is significantly higher than in Germany. In terms of products, this is particularly true for t-shirts (textiles). Furthermore, the factor “Attitude / Environmental Concern” has the greatest influence on the purchase intention for recycled products, followed by “Value / Accessibility” and “Promotion / Certification”. In addition, it is important that the price of the recycled product is not higher than that of the conventional product.

No significant differences between gender, age groups, income, and level of education were found in terms of a strong purchase intention. However, in the South African sample, men have a slightly higher purchase intention than women, although this difference is minimal. No significant differences were found with concerning age groups, with at least one in two having a high purchase intention. For income, purchase intention was greatest (60%) in the second-highest income bracket. Regarding education, purchase intention increases with the level of education, but only marginally.

##### **5.1.4.2 Germany**

Although purchase intention is higher in South Africa, there is an above-average purchase intention for recycled products in Germany. The “Value / Accessibility” factor has the greatest influence, followed by “Price” and “Attitude / Environmental Concern”.

The German sample results also show no significant differences for gender, age groups, or income. However, the strong intention to buy recycled products varies slightly between genders. Thus, women tend to buy recycled products more than men. Regarding age groups, a strong purchase intention was found particularly among the 25 to 49 year-olds, but it was lowest for the youngest respondents (18 to 24-year-olds). Concerning monthly net household income, willingness to buy increases with income, being highest in the middle-income bracket (37%) and then declining slightly. A significant difference exists for education level - the higher the level of education, the higher the purchase intention. Whereas only 26% of respondents with a primary/high school degree have a strong purchase intention, more than 40% of respondents with a university degree or similar have a strong purchase intention.

## 5.2 Practical Implications

Sustainable or circular products such as recycled products are not just a short-term trend but a long-term necessity to ensure sustainable development. Hence, it is vital to learn what makes consumers prefer and purchase such products rather than conventional ones. The present study makes a significant contribution to identifying some of these factors. After conducting a factor analysis, seven factors were identified, all of which influence purchase intention for recycled products in Germany and South Africa.

The study makes another significant contribution by being the first to examine the difference in factors influencing purchase intention of recycled products in developing (South Africa) and developed (Germany) countries. In addition, the study shows that while the factors do not differ significantly between the two countries, the factor with the greatest influence in South Africa is "Attitude / Environmental Concern", while in Germany it is "Value / Accessibility". These findings will help improve the marketing of these products in the respective countries.

The study is also the first to examine purchase intention for different recycled products in two different countries. It was thus possible to establish, both generally and on a country-specific basis, that there is a difference in purchase intention with regard to different products.

Furthermore, the findings reveal more about the target groups. For example, in general (South Africa and Germany), a strong purchase intention for recycled products is highest in the 25 to 49 age groups. Moreover, purchase intention increases with the level of education, which is why it is strongest in those with a university degree or similar. In a country comparison, this finding is particularly significant for Germany.

Derived from the results, the following recommendations can be made for marketers who intend to introduce recycled products into the relevant markets.

- For marketing in *Germany*, greater attention should be paid to highlighting quality features. For example, consumers can be informed there is no loss of quality when buying a recycled product and that its longevity is equal to the conventional variety's. Regarding eco-labels, it is vital in Germany that these are trustworthy, as German shoppers are particularly skeptical of them. Hence, when selecting eco-labels, it is essential to ensure that the certifications are trustworthy and perceived as such by consumers.
- Furthermore, it is recommended that the price does not exceed that of corresponding items made from conventional materials in the respective price segments.
- Since in the German sample only 32.9% expressed a strong purchase intention for recycled products, it is necessary to apply more aggressive marketing to reach the majority with a weaker purchase intention. Accordingly, it is recommended that the quality and environmental aspects should be actively communicated at all touchpoints.
- The communication efforts should integrate educational aspects. It is recommended, for example, that the contribution made by choosing to buy this product should be advertised at the point of sale.
- In *South Africa*, it is recommended to increasingly advertise the product's environmental friendliness. Consumers should be made aware that they are doing something good

for the environment with their purchases. Furthermore, eco-labels play a major role in the purchase intention and should thus be attached to the product.

- In South Africa, it is also important that the price does not exceed that of corresponding items made from conventional materials in the respective price segments.
- Another recommendation can be made concerning the promotion of the products. This is a very important point in South Africa, which should primarily serve to educate people about the product. Furthermore, appropriate communication should be available at the point of sale so that consumers can easily recognize that the product is sustainable.

## 6 Limitations

As with all studies, the present paper has some limitations. The first limitation relates to the fact that the study only includes Germany and South Africa. Although the German sample was representative of Germany due to the quotas, only LSM groups 7 to 10 were included in South Africa, which fundamentally limits the results' generalizability. For future studies, it would be insightful to consider LSM groups 5 and 6, especially since these are gradually approaching the standards of LSM group 7, and this may also impact purchasing behavior (Dobbelstein; Mason; Kamwendo 2020, p. 81).

The second limitation relates to the selection of constructs. Although the selection was based on literature reviews and meta-studies, important variables may not have been included. For example, as emerged from the discussion, knowing how the construct environmental knowledge affects purchase intention for recycled products might offer further insight. Alternative research methodology such as a qualitative or mixed-methods approach could help identify currently unknown influencing factors.

The third limitation relates to the constructs themselves. With regard to price, to obtain more precise results, further studies could ask how much people are willing to pay for a recycled product compared to a conventional product. This information could subsequently be helpful for pricing strategies in the respective countries. In addition, it would be useful to discover the antecedents of some variables. For example, since Germans are skeptical about eco-labels, it would be interesting to identify the origins of this skepticism and thus counteract it.

The fourth limitation relates to the different product types. Initially, the individual factors were not considered in relation to the different products. However, differences could also exist here, as Magnier et al. (2019, p. 94) discovered in their study. Furthermore, only one product was studied as a representative for each product category, making it difficult to generalize for product categories. Future studies should examine several different products and ascertain whether the influencing factors differ with regard to the different products. As far as product categories are concerned, future research could follow the approach of Frank and Brock (2018, p. 1) and investigate high-involvement as well as low-involvement products.

For further studies regarding different product types, it would be insightful to investigate other factors such as the influence of brands. Moreover, it would be interesting to determine the impact on purchase intention of products with recycled packaging. (for example, PET bottles, wine bottles, cosmetics, food, etc.) To obtain even more meaningful results, it would be helpful to discover how purchase intentions for recycled and conventional products differ by comparing identical products. (for example, conventional vs. recycled toilet paper).

The fifth limitation relates to the intention-behavior gap. First, behavior is measured by past behavior and does not measure real behavior in the future, whereas intention refers to future behavior. Hence, past behavior is used as an indicator for behavior in the near future, which might be misleading if the intention has changed between the last purchase and the questionnaire. The second limitation is that conclusions can only be drawn for the sample.

The sixth limitation relates to the lack of investigation of cultural aspects. Future research could investigate whether cultural differences affect purchase intention for recycled products.

This approach would also have the advantage of making the results valid for the respective countries and similar cultures.

The seventh limitation relates to the target groups of the respective countries. For example, it was discovered that purchase intentions are lowest for 18-to 24-year-olds in Germany, but the causes of this were not investigated, so no recommendations can be made on how the individual target groups can be reached.

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## **Appendix**

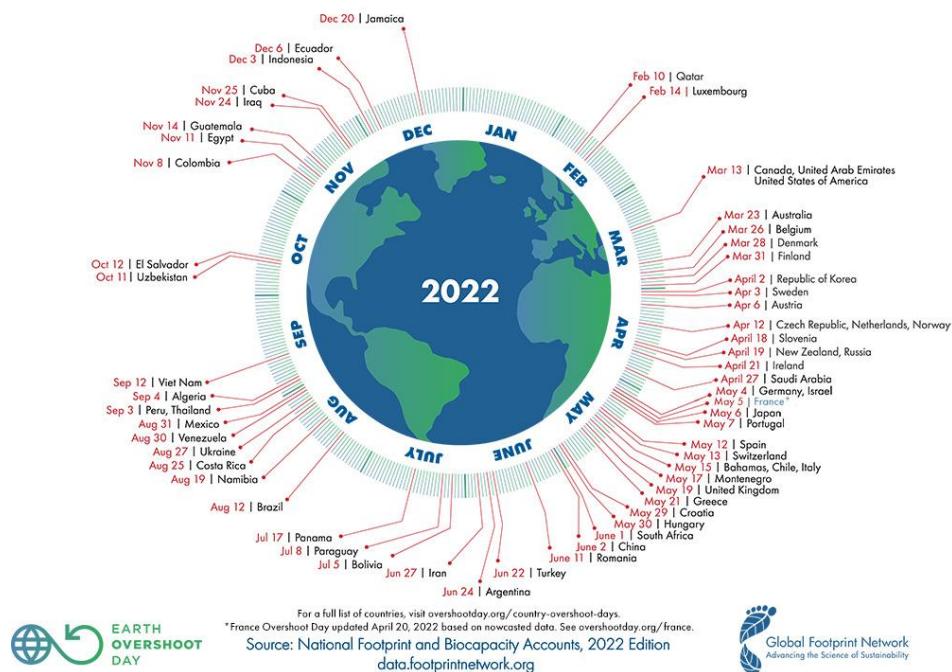
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## Appendix A: Country Overshoot Days 2022

# Country Overshoot Days 2022

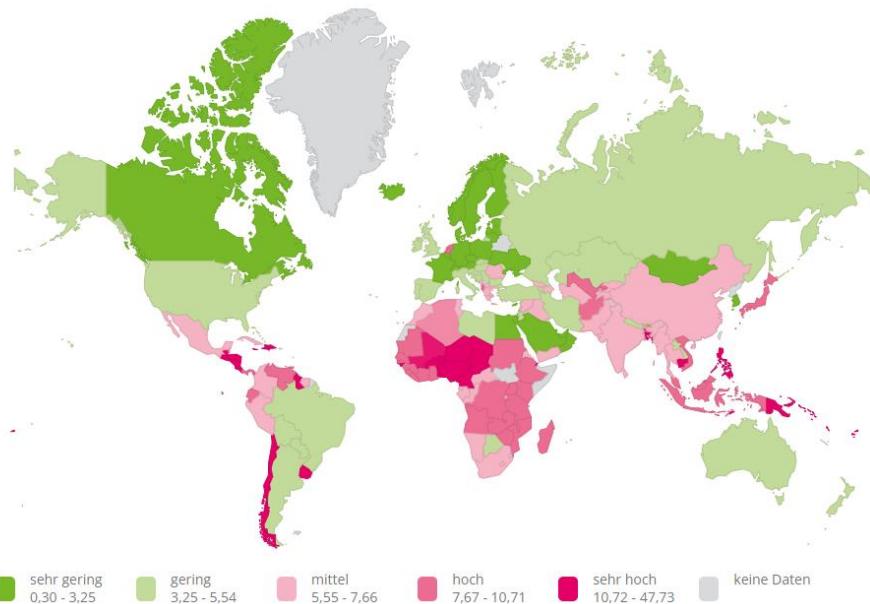
When would Earth Overshoot Day land if the world's population lived like...



Source: (Earth Overshoot Day 2022b)

## Appendix B: World Risk Report 2021

### Weltkarte des Risikos 2021



Source: (Bündnis Entwicklung Hilft 2022)

Appendix C: Literature Overview of Purchase Intentions of Recycled Products

No.	Author(s)	Sample	Country	Data Collection	Product Type	Dependet Variable(s)	Independent Variable(s)
1	Queiroz et al. (2021)	N = 422	Brazil	Online Survey	Recycled PET Products	• Purchase Intention	• Perceived quality • Product image • Sustainability/environmental benefits • Safety
2	Luu; Baker (2021)	N = 495	Vietnam	Online Survey	Recycled PET Bottle-Based Apparel	• Purchase Intention	• Perceived Quality • Product Image • Sustainability • Safety
3	Bae (2021)	N = 170 N = 100	U.S.	2 Online Surveys	Recycled Products	• Purchase Intention	• Implicit Theories • Perceived Product Quality • Reactions to Recycled Products
4	Chi et al. (2021)	N = 16	U.S.	Qualitative Interviews	Recycled Athletic Apparel	• Purchase Intention	• Functional value • Emotional value • Epistemic value • Conditional value • Social value
5	Chaturvedi et al. (2020)	N = 497	India	Online Survey	Recycled Clothing	• Purchase Intention	• Environmental concern • Personal norms • Willingness to pay • Perceived value
6	Calvo-Porrall; Lévy-Mangin (2020)	N = 312	Spain	Online Survey	Recycled Goods	• Purchase Intention	• Perceived quality • Product image • Sustainability/environmental benefits • Safety

7	Nguyen et al. (2020)	N = 425	Vietnam	Online Survey	Fashion made of recycled plastic waste	• Purchase Intention (Consumption Behavior)	<ul style="list-style-type: none"> <li>• Price</li> <li>• Environmental awareness</li> <li>• Product quality</li> <li>• Community influence</li> <li>• Consumer identity</li> <li>• Product's versatility</li> <li>• Awareness of brand image</li> </ul>
8	Park and Lin (2020)	N = 217	Korea	Online Survey	Recycled and up-cycled fashion products	<ul style="list-style-type: none"> <li>• Purchase Intention</li> <li>• Purchase Experience</li> </ul>	<ul style="list-style-type: none"> <li>• Availability risk</li> <li>• Economic risk</li> <li>• Utilitarian value</li> <li>• Self-expressiveness</li> <li>• Interpersonal differentiation</li> <li>• Subjective norms</li> <li>• Perceived consumer effectiveness</li> <li>• Environmental concern</li> </ul>
9	Meng; Leary (2019)	N = 215	U.S.	Online Survey	Fashion made of recycled plastic bottles	• Purchase intention	<ul style="list-style-type: none"> <li>• Contagion</li> <li>• Contamination</li> <li>• Disgust</li> </ul>
10	Magnier et al. (2019)	N = 258	Netherlands	Online Survey	Products made of ocean plastic	<ul style="list-style-type: none"> <li>• Purchase Intention</li> <li>• Willingness to Pay</li> </ul>	<ul style="list-style-type: none"> <li>• Perceived benefits (Environmental benefits, anticipated conscience, recognisability)</li> <li>• Perceived risks (reduced quality and functionality, limited attractiveness, value for money, contamination, perceived safety)</li> </ul>
11	Sun et al. (2017)	N = 215	Hong Kong	Survey	Recycled products (A4 paper, mobile phones, printers)	<ul style="list-style-type: none"> <li>• Purchase intention</li> <li>• Purchase behavior</li> </ul>	<ul style="list-style-type: none"> <li>• Risk and uncertainty</li> <li>• Environmental knowledge</li> <li>• Perceived Quality</li> <li>• Attitude toward environmental protection</li> </ul>
12	Hamzaoui-Essoussi	N = 359	Canada	Survey	Recycled/remanufactured products	• Willingness to pay	<ul style="list-style-type: none"> <li>• Product category</li> <li>• Perceived risk</li> </ul>

	and Linton (2014)						• Perceived quality • Brand name
13	Hamzaoui Essoussi and Linton (2010)	N = 49	Canada	Survey	Recycled products	• Willingness to pay premium prices	• Functional risk
14	Bigiardi et al. (2020)	-	-	Theoretical Framework	Recycled Products	• Purchase Intention	-

Source: own illustration

#### Appendix D: Comparing Constructs

Block	Construct / Variable	Description	(Zhang; Dong 2020, p. 7)	(Zhuang; Luo; Usman Riaz 2021, p. 5)	(Wijekoon; Fazli Sabri 2021, p. 7 ff)
Individual-related constructs	Altruistic values	Values that let us contribute to the welfare of others			Altruistic values
	Biospheric values	Values that make us feel concerned for the nature and biosphere			Biospheric values
	Environmental consciousness/concern	Concern for the environment	Environmental concern/consciousness/ethics/responsibility, Awareness of green products/environment	Environmental Concern	Environmental Consciousness, Environmental Concern
	Awareness of consequences	Awareness of what consequences our own behavior has			Consequence awareness
	Ascription of responsibility	Not wanting to take responsibility for the consequences of our own behavior			Perceived environmental responsibility, personal responsibility
	Subjective Norm	Influence of other people on our own behavior	Subjective/Moral norm, Social Norm	Subjective norm	Subjective norms
	Perceived behavioral control	To what extent a desired behavior can also be implemented	Perceived behavioral control	Perceived behavioral control	Perceived behavioral control
	Ambiguity tolerance	Being tolerant in contradictory situations			

	Attitude	The attitude leads to a certain behavior	Attitude toward environment/green products	Attitude	Attitudes
	Perceived value	The “trade-off between perceived benefit and perceived sacrifice”	Values (in general)	Green perceived value	Perceived value, green perceived value
	Perceived risk	Perceived risk towards a product or service	Perceived risk/trust	Green perceived risk	Perceived risk
Product-related constructs	Certification	Certificates of a product	Eco-label		Eco-labelling
	Brand equity	The value of a brand			Brand image
	Price	The price of a product	Product price		Price
	Quality and functionalities	The quality characteristics of the product	Product quality (in general)	Green perceived quality	Green perceived quality (p. 7), perceived quality (p. 8)
	Green characteristics	Refers to the green characteristics of the seller			
Context-related constructs	Seller reputation	The reputation of the seller			
	Promotion	Advertising and all communication measures	Advertisement, Marketing influence		Green advertising
	Distribution	Access and availability of the products	Availability		Availability of a product

Source: own illustration based on Bigliardi et al. (2020, p. 8)

#### Appendix E: Overview of all Items

<b>Individual-related variables</b>	
IR 1	AT1: I like the idea of buying recycled products.
IR 2	AT2: I think it's a good idea to buy recycled products.
IR 3	AT3: I have a positive attitude towards recycled products.
IR 4	SN1: People I care about think I should buy recycled products.
IR 5	SN2: People I care about would want me to buy recycled products.
IR 6	SN3: People whose opinions I value would appreciate me buying recycled products.
IR 7	PBC1: I know where to buy recycled products.
IR 8	PBC2: Recycled products are easy to identify.
IR 9	PBC3: I find recycled products to be easily accessible.
IR 10	EC1: I am concerned about the current environmental changes.

IR 11	EC2: I am concerned about the long-term consequences of unsustainable behavior.
IR 12	EC3: I am concerned about the lasting damage that humans are inflicting on the environment.
IR 13	PR1: I am afraid that the quality of recycled products is not as good as that of products with new/conventional materials.
IR 14	PR2: I am afraid that recycled products might not function as well as products with new/conventional materials.
IR 15	PR3: I am afraid that buying recycled products is not a good investment.
IR 16	PR4: I am afraid that I will have to return recycled products more frequently than products with new/conventional materials.
IR 17	PR5: I am afraid that people I value will disapprove of me when buying recycled products.
IR 18	PR6: It makes me feel uncomfortable when I think of buying recycled products.
IR 19	PV1: I consider recycled products to be of good value.
IR 20	PV2: Compared to products with new/conventional materials, recycled products have a better price-performance ratio.
IR 21	PV3: Recycled products will satisfy my wants and needs.
IR 22	PCE1: There is not a lot that an individual can do to help solve environmental problems.
IR 23	PCE2: One person's efforts are meaningless as long as other people refuse to contribute to solving environmental problems.
IR 24	PCE3: I feel that I can help solving environmental problems when buying recycled products.

#### **Product-related variables**

PR 1	P1: I would pay more for a recycled product than for product made of new/conventional materials.
PR 2	P2: I would pay less for a recycled product than for a product made of new/conventional materials.
PR 3	P3: If the price of a recycled product was the same as the price of a product made of new/conventional materials, I would choose the recycled product.
PR 4	QF1: Recycled products are of good quality.
PR 5	QF2: Recycled products have a quality similar to that of products made of new/conventional materials.
PR 6	QF3: I think products made of recycled materials are contaminated.
PR 7	QF4: In my opinion, products made of recycled materials are disgusting.
PR 8	C1: I trust eco-labels since they are a sign that the product is environmentally friendly.
PR 9	C2: An eco-label on a recycled product encourages me in buying the product.
PR 10	C3: An eco-label on a recycled product increases the credibility of the product.

#### **Context-related variables**

CR 1	D1: The lack of availability of recycled products affects my purchase intention.
CR 2	D2: Recycled products are not sold in any stores close to where I live.

CR 3	D3: In order to locate recycled products, I have to research.
CR 4	P1: Promotion can help me to find out more about recycled products.
CR 5	P2: Promotion can help me learn about the environmental impact caused by buying products with new/conventional materials.
CR 6	P3: The stronger the promotion, the higher my attention to recycled products.

#### **Purchase intention**

DV3	PI1: I am considering buying recycled products in the near future.
DV4	PI2: I will encourage my family and friends to buy recycled products.
DV5	PI3: When I have to choose between a recycled and a product made of new/conventional materials, I will typically choose the recycled version.
DV6	PI4: I would consider buying a t-shirt made of recycled materials in the near future.
DV7	PI5: I would consider buying a mobile phone made of recycled materials at my next purchase.
DV8	PI6: I would consider buying toilet paper made of recycled materials in the near future.

#### **Purchase Behavior**

DV1	PB1: In the past, how often have you bought the following products made of recycled materials instead of new/conventional materials?
a	T-Shirt
b	Mobile phone
c	Toilet paper
DV2	PB2: How often have you bought any other products made of recycled material in the past?

Source: own illustration

## Appendix F: Survey for the South African Sample (english)

Dear participants,

in this questionnaire, you are asked about your opinion on the subject of recycled products.

Please think of products that are made partly or entirely from recycled materials.

With recycling is meant the processing and reuse of various raw materials such as glass, textiles, metals, paper, etc.

It takes about five minutes to answer the questionnaire.

We ask you to read the questions carefully and to click on the available answer options.

In order to evaluate the questionnaire, please note that each question must be answered.

We thank you for your support!

### How and why your data is collected

Your data will be collected anonymously.

No conclusions can be drawn as to who answered the questionnaire.

The data will subsequently be analyzed for the purpose of a scientific research project.

If you are interested in the research results or would like to contact us for any other reason, please use the contact details below.

### Contact details

Vorarlberg University of Applied Sciences

Carina Lochner

[carina.lochner@students.fhv.at](mailto:carina.lochner@students.fhv.at)

I agree to the processing of my personal data in accordance with the information provided herein

[I don't want to participate](#)

[\*\*START THE SURVEY\*\*](#)

Please select your gender.

male

female

diverse/not specified

## How old are you?

---

17 and younger

18 - 24

25 - 34

35 - 49

50 - 64

65 and older

---

## Into what category does your net income per month fall? (Income of the whole household, after tax)

---

0 - R8 000

R 8 001 - 18 000

R18 001 - 37 000

R 37 001 - 63 000

more than R 63 000

## What is your level of education?

---

None

Primary / high school

Some higher education

University degree or similar

---

## I am afraid that buying recycled products is not a good investment.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

---

## I am afraid that I will have to return recycled products more frequently than products with new/conventional materials.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

It makes me feel uncomfortable when I think of buying recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I have a positive attitude towards recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I am concerned about the long-term consequences of unsustainable behavior.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I am concerned about the current environmental changes.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

People I care about would want me to buy recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I feel that I can help solving environmental problems when buying recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Recycled products will satisfy my wants and needs.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

People whose opinions I value would appreciate me buying recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Recycled products are easy to identify.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I am afraid that recycled products might not function as well as products with new/conventional materials.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

There is not a lot that an individual can do to help solve environmental problems.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I find recycled products to be easily accessible.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I consider recycled products to be of good value.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I think it's a good idea to buy recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

People I care about think I should buy recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I know where to buy recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I like the idea of buying recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I am afraid that the quality of recycled products is not as good as that of products with new/conventional materials.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

One person's efforts are meaningless as long as other people refuse to contribute to solving environmental problems.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I am afraid that people I value disapprove of me when buying recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I am concerned about the lasting damage that humans are inflicting on the environment.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Compared to products with new/conventional materials, recycled products have a better price-performance ratio.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

If the price of a recycled product was the same as the price of a product made of new/conventional materials, I would choose the recycled product.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I would pay more for a recycled product than for a product made of new/conventional materials.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I would pay less for a recycled product than for a product made of new/conventional materials.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I think products made of recycled materials are contaminated.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

In my opinion, products made of recycled materials are disgusting.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

An eco-label on a recycled product encourages me in buying the product.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

An eco-label on a recycled product increases the credibility of the product.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Recycled products have a quality similar to that of products made of new/conventional materials.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Recycled products are of good quality.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I trust eco-labels since they are a sign that the product is environmentally friendly.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

The stronger the promotion, the higher my attention to recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Recycled products are not sold in any stores close to where I live.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Promotion can help me to find out more about recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

The lack of availability of recycled products affects my purchase intention.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Promotion can help me learn about the environmental impact caused by buying products with new/conventional materials.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

In order to locate recycled products I have to research.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

How often have you bought any other products made of recycled materials in the past?

---

All the time	Usually (about 90%)	Frequently (about 70%)	Sometimes (about 50%)	Occasionally (about 30%)	Rarely (less than 10%)	Never
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the past, how often have you bought the following products made of recycled materials instead of new/conventional materials?

---

T-Shirt

- All the time
- Usually (about 90%)
- Frequently (about 70%)
- Sometimes (about 50%)
- Occasionally (about 30%)
- Rarely (less than 10%)
- Never

Mobile Phone

- All the time
- Usually (about 90%)
- Frequently (about 70%)
- Sometimes (about 50%)
- Occassionally (about 30%)
- Rarely (less than 10%)
- Never

Toilet Paper

- All the time
- Usually (about 90%)
- Frequently (about 70%)
- Sometimes (about 50%)
- Occassionally (about 30%)
- Rarely (less than 10%)
- Never

When I have to choose between a recycled and a product made of new/conventional materials, I will typically choose the recycled version.

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I am considering buying recycled products in the near future.

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I would consider buying toilet paper made of recycled materials in the near future.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I would consider buying a t-shirt made of recycled materials in the near future.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I will encourage my family and friends to buy recycled products.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

I would consider buying a mobile phone made of recycled materials at my next purchase.

---

Strongly agree	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	Strongly disagree
<input type="radio"/>						

Thank you for your participation!

## Appendix G: Survey for the German Sample (german)

Sehr geehrte Teilnehmer\*innen,

In der Umfrage möchten wir von Ihnen wissen, wie Sie zum Thema Recyclingprodukte stehen. Darunter stellen Sie sich bitte Produkte vor, welche teilweise oder ganz aus recycelten Materialien bestehen. Unter Recycling wird die Aufbereitung und Wiederverwertung diverser Rohstoffe wie Glas, Textilien, Metalle, Papier usw. verstanden.

Es dauert ca. fünf Minuten, um den Fragebogen zu beantworten. Wir bitten Sie die Fragen sorgfältig durchzulesen und auf die vorhandenen Antwortmöglichkeiten zu klicken. Um den Fragebogen auswerten zu können beachten Sie bitte, dass jede Frage beantwortet werden muss.

Wir bedanken uns herzlich für Ihre Unterstützung!

### Wie und weshalb Ihre Daten erhoben werden

Ihre Daten werden vollständig anonym erhoben. Es können keine Rückschlüsse gezogen werden, wer den Fragebogen beantwortet hat. Die Daten werden im Anschluss zum Zwecke eines wissenschaftlichen Forschungsprojektes ausgewertet. Sollte Interesse an den Forschungsergebnissen bestehen oder möchten Sie aus anderen Gründen mit uns in Kontakt treten, dann wenden Sie sich bitte an den untenstehenden Kontakt.

### Kontaktdaten

Fachhochschule Vorarlberg  
Carina Lochner  
carina.lochner@students.fhv.at

Ich erkläre mich mit der Verarbeitung meiner persönlichen Daten in Übereinstimmung mit den hierin enthaltenen Informationen einverstanden

Ich möchte nicht teilnehmen

UMFRAGE STARTEN

### Bitte wählen Sie Ihr Geschlecht.

- männlich
- weiblich
- divers

## Wie alt sind Sie?

---

17 und jünger

18 - 24

25 - 34

35 - 49

50 - 64

65 und älter

## In welche Kategorie fällt Ihr monatliches Haushaltsnettoeinkommen? (Einkommen des gesamten Haushalts, nach Abzug von Steuern)

---

0 - 1.250 €

1.251 bis 2.000 €

2.001 bis 3.000 €

3.001 bis 5.000 €

5.001 € und mehr

## Welcher ist Ihr höchster formaler Schulabschluss?

---

Kein Abschluss

Hauptschule / Realschule / mittlere Reife

Abitur oder gleichwertiger Abschluss

Hochschule / Universität oder Vergleichbares

## Mich beunruhigen die aktuellen Entwicklungen unserer Umwelt.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich fürchte, dass der Kauf von Recyclingprodukten keine gute Investition ist.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>						

Menschen, deren Meinung ich achte, würden es schätzen, wenn ich Recyclingprodukte kaufe.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>						

Recyclingprodukte haben ein besseres Preis-Leistungs-Verhältnis im Vergleich zu Produkten aus neuen/herkömmlichen Materialien.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>						

Ich habe die Befürchtung, dass ich Recyclingprodukte häufiger retournieren muss als Produkte aus neuen/herkömmlichen Materialien.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>						

Recyclingprodukte erfüllen meine Bedürfnisse und Wünsche.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>						

Recyclingprodukte sind leicht erkennbar.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>						

Ich empfinde Recyclingprodukte als wertig.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Menschen, die mir wichtig sind, finden, dass ich Recyclingprodukte kaufen sollte.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich halte es für eine gute Idee, Recyclingprodukte zu kaufen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich bin der Meinung, dass ich mit dem Kauf von Recyclingprodukten dazu beitragen kann, die Probleme unserer Umwelt zu lösen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich habe die Befürchtung, dass Recyclingprodukte nicht so gut funktionieren wie Produkte aus neuen/herkömmlichen Materialien.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich bin besorgt über die bleibenden Schäden, die die Menschheit der Umwelt zufügt.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich sorge mich um die langfristigen Folgen eines nicht nachhaltigen Verhaltens.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Mir gefällt der Gedanke, Recyclingprodukte zu kaufen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Es ist einfach, an Recyclingprodukte zu kommen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich fürchte, dass die Qualität von Recyclingprodukten nicht so gut ist wie jene von Produkten aus neuen/herkömmlichen Materialien.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich habe eine positive Haltung gegenüber Recyclingprodukten.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Menschen, die mir wichtig sind, würden wollen, dass ich Recyclingprodukte kaufe.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Die Bemühungen einer einzelnen Person sind sinnlos, solange sich andere Menschen weigern, zur Lösung von Umweltproblemen beizutragen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich weiß, wo ich Recyclingprodukte kaufen kann.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Beim Gedanken Recyclingprodukte zu kaufen, fühle ich mich unwohl.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich befürchte, dass Menschen, die ich schätze, mich ablehnen würden, wenn ich Recyclingprodukte kaufe.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Eine einzelne Person kann nicht viel tun, um zur Lösung von Umweltproblemen beizutragen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Für ein Recyclingprodukt würde ich weniger Geld ausgeben als für ein Produkt aus neuen/herkömmlichen Materialien.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich denke, dass Recyclingprodukte verunreinigt sind.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Wenn der Preis für ein Recyclingprodukt gleich hoch wäre als jener für ein Produkt aus neuen/herkömmlichen Materialien, so würde ich mich für das Recyclingprodukt entscheiden.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Recyclingprodukte haben eine ähnlich gute Qualität wie Produkte aus neuen/herkömmlichen Materialien.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich finde, dass Recyclingprodukte eine gute Qualität haben.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Meines Erachtens sind Recyclingprodukte abstoßend.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Für ein Recyclingprodukt würde ich mehr Geld ausgeben als für ein Produkt aus neuen/herkömmlichen Materialien.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ein Umweltsiegel auf dem Recyclingprodukt erhöht die Glaubwürdigkeit des Produkts.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ein Umweltsiegel auf einem Recyclingprodukt bestärkt mich darin, das Produkt zu kaufen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Ich vertraue Umweltsiegel, da sie Produkte als umweltfreundlich kennzeichnen.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Recyclingprodukte werden nicht in den Geschäften in meiner Nähe verkauft.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Je stärker die Werbung, desto größer ist meine Aufmerksamkeit für Recyclingprodukte.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Werbung kann mir dabei helfen zu erfahren, welche Umweltbelastung der Kauf von Produkten mit neuen/herkömmlichen Materialien mit sich bringt.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Die mangelnde Verfügbarkeit von Recyclingprodukten beeinflusst meine Kaufabsicht.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Werbung kann mir dabei helfen, mehr über Recyclingprodukte zu erfahren.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Um Recyclingprodukte zu finden, muss ich einen größeren Suchaufwand betreiben.

---

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Wie oft haben Sie in der Vergangenheit die folgenden Produkte aus Recyclingmaterialien anstatt aus neuen/herkömmlichen Materialien gekauft?

---

T-Shirt

- Immer
  - Sehr oft (ca. 90%)
  - Häufig (ca. 70%)
  - Manchmal (ca. 50%)
  - Gelegentlich (ca. 30%)
  - Selten (weniger als 10%)
  - Nie
- 

Mobiltelefon

- Immer
  - Sehr oft (ca. 90%)
  - Häufig (ca. 70%)
  - Manchmal (ca. 50%)
  - Gelegentlich (ca. 30%)
  - Selten (weniger als 10%)
  - Nie
- 

Toilettenpapier

- Immer
- Sehr oft (ca. 90%)
- Häufig (ca. 70%)
- Manchmal (ca. 50%)
- Gelegentlich (ca. 30%)
- Selten (weniger als 10%)
- Nie

Wie oft haben Sie in der Vergangenheit andere Produkte aus Recyclingmaterialien gekauft?

---

Immer	Sehr oft (ca. 90%)	Häufig (ca. 70%)	Manchmal (ca. 50%)	Gelegentlich (ca. 30%)	Selten (weniger als 10%)	Nie

Ich erwäge, beim nächsten Kauf ein Mobiltelefon aus Recyclingmaterialien zu kaufen.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu

Ich erwäge, künftig Recyclingprodukte zu kaufen.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu

Ich werde meine Familie und Freunde dazu ermutigen, Recyclingprodukte zu kaufen.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu

Ich erwäge, künftig Toilettenpapier aus Recyclingmaterialien zu kaufen.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu

Ich erwäge, künftig ein T-Shirt aus Recyclingmaterialien zu kaufen.

---

Stimme sehr zu	Stimme zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu

Wenn ich zwischen einem Recyclingprodukt und einem Produkt aus neuen/herkömmlichen Materialien entscheiden muss, so würde ich mich für das Recyclingprodukt entscheiden.

Stimme sehr zu	Stimme zu zu	Stimme eher zu	Neutral	Stimme eher nicht zu	Stimme nicht zu	Stimme überhaupt nicht zu
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				

Appendix H: Factor Analysis / Rotated Component Matrix (Variables)

**Rotated Component Matrix<sup>a</sup>**

	Component							
	1	2	3	4	5	6	7	
I like the idea of buying recycled products. - IR1_AT1	-,270	,537	,232	,351	,233	,208	,184	
I think it's a good idea to buy recycled products. - IR2_AT2	-,363	,543	,236	,321	,192	,112	,184	
I have a positive attitude towards recycled products. - IR3_AT3	-,322	,542	,203	,384	,177	,086	,187	
People I care about think I should buy recycled products. - IR4_SN1	,033	,215	,141	,295	,741	,088	,033	
People I care about would want me to buy recycled products. - IR5_SN2	-,001	,239	,190	,225	,755	,120	,054	
People whose opinions I value would appreciate me buying recycled products. - IR6_SN3	-,041	,307	,215	,200	,713	,061	,091	
I know where to buy recycled products. - IR7_PBC1	,048	,106	,134	,703	,195	,168	-,254	
Recycled products are easy to identify. - IR8_PBC2	,239	,010	,116	,584	,161	,068	-,170	
I find recycled products to be easily accessible. - IR9_PBC3	,095	,047	,170	,711	,205	,112	-,276	

I am concerned about the current environmental changes. - IR10_EC1	-,120	,747	,244	-,011	,134	,093	-,.010
I am concerned about the long-term consequences of unsustainable behavior. - IR11_EC2	-,054	,751	,208	-,022	,164	,115	-,023
I am concerned about the lasting damage that humans are inflicting on the environment. - IR12_EC3	-,151	,777	,264	,041	,121	,065	-,040
I am afraid that the quality of recycled products is not as good as that of products with new/conventional materials. - IR13_PR1	,766	-,028	,020	-,150	,017	-,178	,006
I am afraid that recycled products might not function as well as products with new/conventional materials. - IR14_PR2	,793	-,001	,006	-,100	,000	-,178	,023
I am afraid that buying recycled products is not a good investment. - IR15_PR3	,774	-,161	-,119	-,068	-,056	-,028	,043
I am afraid that I will have to return recycled products more frequently than products with new/conventional materials. - IR16_PR4	,739	-,030	,075	-,021	,052	-,086	,042
I am afraid that people I value disapprove of me when buying recycled products. - IR17_PR5	,708	-,100	,027	,118	,019	,046	,182
It makes me feel uncomfortable when I think of buying recycled products. - IR18_PR6	,763	-,210	-,068	-,075	,001	-,015	-,003

I consider recycled products to be of good value. - IR19_PV1	-,286	,416	,201	,481	,244	,125	,226
Compared to products with new/conventional materials, recycled products have a better price-performance ratio. - IR20_PV2	,037	,104	,342	,429	,322	-,100	,253
Recycled products will satisfy my wants and needs. - IR21_PV3	-,243	,374	,175	,430	,343	,178	,235
There is not a lot that an individual can do to help solve environmental problems. - IR22_PCE1	,549	-,045	-,215	,263	-,182	-,033	,198
One person's efforts are meaningless as long as other people refuse to contribute to solving environmental problems. - IR232_PCE2	,514	,074	-,091	,295	-,291	-,125	,174
RECODE: I feel that I can help solving environmental problems when buying recycled products. - IR24_PCE3_RECODE	,221	-,558	-,336	-,191	-,236	-,100	-,077
I would pay more for a recycled product than for a product made of new/conventional materials. - PR1_P1	,219	,072	,178	,277	,236	,680	,021
RECODE: I would pay less for a recycled product than for a product made of new/conventional materials. - PR2_P2_RECODE	-,298	,078	-,113	-,108	-,042	,590	-,230

If the price of a recycled product was the same as the price of a product made of new/conventional materials, I would choose the recycled product. - PR3_P3	-,172	,251	,183	,174	,087	,621	,097
Recycled products are of good quality. - PR4_QF1	-,316	,277	,283	,417	,174	,383	,183
Recycled products have a quality similar to that of products made of new/conventional materials. - PR5_QF2	-,283	,188	,103	,402	,131	,447	,239
I think products made of recycled materials are contaminated. - PR6_QF3	,734	-,217	-,075	,099	-,018	,012	,090
In my opinion, products made of recycled materials are disgusting. - PR7_QF4	,745	-,274	-,102	,066	,030	,058	,113
I trust eco-labels since they are a sign that the product is environmentally friendly. - PR8_C1	-,099	,245	,581	,240	,315	,167	-,008
An eco-label on a recycled product encourages me in buying the product. - PR9_C2	-,106	,300	,558	,180	,337	,279	,051
An eco-label on a recycled product increases the credibility of the product. - PR10_C3	-,045	,244	,533	,166	,322	,261	-,010
The lack of availability of recycled products affects my purchase intention. - CR1_D1	,211	,085	,186	,002	,191	,161	,604
Recycled products are not sold in any stores close to where I live. - CR2_D2	,386	-,007	-,004	-,222	-,015	-,078	,631
In order to locate recycled products I have to research. - CR3_D3	,184	,065	,229	-,160	,011	-,058	,674

Promotion can help me to find out more about recycled products. - CR4_P1	-,113	,239	,799	,085	,047	-,012	,125
Promotion can help me learn about the environmental impact caused by buying products with new/conventional materials. - CR5_P2	-,032	,270	,770	,107	,082	,048	,102
The stronger the promotion, the higher my attention to recycled products. - CR6_P3	,015	,208	,762	,110	,080	-,007	,167

Extraction Method: Principal Component Analysis.  
 Rotation Method: Varimax with Kaiser Normalization.  
 a. Rotation converged in 11 Iterations

#### Appendix I: KMO value and Bartlett's Test (variables)

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,948
Bartlett's Test of Sphericity	28184,561
df	780
Sig.	,000

#### Appendix J: Factor Analysis / Component Matrix (variable purchase intention)

#### Component Matrix<sup>a</sup>

	Component 1
I am considering buying recycled products in the near future.	,894
I will encourage my family and friends to buy recycled products.	,894
When I have to choose between a recycled and a product made of new/conventional materials, I will typically choose the recycled version.	,837

Extraction Method: Principal Component Analysis.  
 a. 1 components extracted

Appendix K: KMO value and Bartlett's test (variable purchase intention)

**KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,714
Bartlett's Test of Sphericity	Approx. Chi-Square
	df
	Sig.

Appendix L: Cronbach's Alpha for all Items

**Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,847	,874	50

Appendix M: Regression Analysis, Model Summary (overall)

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,831 <sup>a</sup>	,690	,688	,65074	2,002

a. Predictors: (Constant), Availability (1 = positive (easy available) / 7 = negative), Value / Accessibility (1 = negative / 7 = positive), Uncertainty (1 = positive (low uncertainty) / 7 = negative (high uncertainty)), Price (1 = negative / 7 = positive), Subjective Norm (1 = negative / 7 = positive), Promotion / Certification (1 = negative (little promotion, little help) / 7 = positive), Attitude / Environmental Concern (1 = negative (little concern, less purchase) / 7 = positive)

b. Dependent Variable: purchase Intention (1 = low / 7 high)

Appendix N: Regression Analysis, ANOVA (overall)

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1213,316	7	173,331	409,316	,000 <sup>b</sup>
	Residual	544,999	1287	,423		
	Total	1758,315	1294			

a. Dependent Variable: purchase Intention rec produ (1 = low / 7 high)

b. Predictors: (Constant), Availability (1 = positive (easy available) / 7 = negative), Value / Accessibility (1 = negative / 7 = positive), Uncertainty (1 = positive (low uncertainty) / 7 = negative (high uncertainty)), Price (1 = negative / 7 = positive), Subjective Norm (1 = negative / 7 = positive), Promotion / Certification (1 = negative (little promotion, little help) / 7 = positive), Attitude / Environmental Concern (1 = negative (little concern, less purchase) / 7 = positive)

Appendix O: Regression Analysis, Coefficients (overall)

Model		Coefficients <sup>a</sup>						Collinearity Statistics	
		Unstandardized Coefficients		Standardized Coefficients		t	Sig.		
		B	Std. Error	Beta					
1	(Constant)	-,058	,161			-,363	,716		
	Uncertainty	-,125	,019		-,131	-6,710	,000	,633 1,579	
	Attitude / Environmental Concern	,289	,030		,243	9,683	,000	,382 2,615	
	Promotion / Certification	,226	,024		,217	9,553	,000	,466 2,148	
	Value / Accessibility	,252	,029		,203	8,800	,000	,451 2,217	
	Subjective Norm	,129	,019		,143	6,719	,000	,535 1,870	
	Price	,178	,018		,178	9,963	,000	,755 1,324	
	Availability	,056	,017		,060	3,384	,001	,771 1,297	

a. Dependent Variable: purchase Intention rec produ (1 = low / 7 high)

Appendix P: Regression Analysis, Model Summary (South Africa)

Model	R	R Square	Model Summary <sup>a,c</sup>			Durbin-Watson
			Adjusted R Square	Std. Error of the Estimate		
1	,781 <sup>b</sup>	,610	,606	,62679		2,070

a. Country = South Africa

b. Predictors: (Constant), Availability (1 = positive (easy available) / 7 = negative), Value / Accessibility (1 = negative / 7 = positive), Uncertainty (1 = positive (low uncertainty) / 7 = negative (high uncertainty)), Price (1 = negative / 7 = positive), Subjective Norm (1 = negative / 7 = positive), Promotion / Certification (1 = negative (little promotion, little help) / 7 = positive), Attitude / Environmental Concern (1 = negative (little concern, less purchase) / 7 = positive)

c. Dependent Variable: purchase Intention (1 = low / 7 high)

Appendix Q: Regression Analysis, ANOVA (South Africa)

ANOVA <sup>a,b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	420,847	7	60,121	153,030	,000 <sup>c</sup>
	Residual	268,724	684	,393		
	Total	689,570	691			

a. Country = South Africa

b. Dependent Variable: purchase Intention rec produ (1 = low / 7 high)

c. Predictors: (Constant), Availability (1 = positive (easy available) / 7 = negative), Value / Accessibility (1 = negative / 7 = positive), Uncertainty (1 = positive (low uncertainty) / 7 = negative (high uncertainty), Price (1 = negative / 7 = positive), Subjective Norm (1 = negative / 7 = positive), Promotion / Certification (1 = negative (little promotion, little help) / 7 = positive), Attitude / Environmental Concern (1 = negative (little concern, less purchase) / 7 = positive)

Appendix R: Regression Analysis, Coefficients (South Africa)

Model	Coefficients <sup>a,b</sup>						
	B	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics	
		Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	,015	,250		,061	,952	
	Uncertainty	-,099	,024	-,117	-4,064	,000	,687 1,456
	Attitude / Environmental Concern	,319	,044	,247	7,179	,000	,482 2,073
	Promotion / Certification	,254	,041	,213	6,265	,000	,495 2,021
	Value / Accessibility	,239	,037	,221	6,515	,000	,497 2,013
	Subjective Norm	,082	,026	,097	3,179	,002	,607 1,649
	Price	,168	,023	,200	7,453	,000	,788 1,269
	Availability	,038	,022	,047	1,764	,078	,796 1,256

1. Country = South Africa

2. Dependent Variable: purchase Intention (1 = low / 7 high)

Appendix S: Regression Analysis, Model Summary (Germany)

Model Summary <sup>a,c</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,848 <sup>b</sup>	,719	,716	,66609	1,947

- a. Country = Germany
- b. Predictors: (Constant), Availability (1 = positive (easy available) / 7 = negative), Value / Accessibility (1 = negative / 7 = positive), Uncertainty (1 = positive (low uncertainty) / 7 = negative (high uncertainty)), Price (1 = negative / 7 = positive), Subjective Norm (1 = negative / 7 = positive), Promotion / Certification (1 = negative (little promotion, little help) / 7 = positive), Attitude / Environmental Concern (1 = negative (little concern, less purchase) / 7 = positive)
- c. Dependent Variable: purchase Intention (1 = low / 7 high)

Appendix T: Regression Analysis, ANOVA (Germany)

ANOVA <sup>a,b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	675,758	7	96,537	217,582	,000 <sup>c</sup>
	Residual	263,990	595	,444		
	Total	939,748	602			

- a. Country = Germany
- b. Dependent Variable: purchase Intention (1 = low / 7 high)
- c. Predictors: (Constant), Availability (1 = positive (easy available) / 7 = negative), Value / Accessibility (1 = negative / 7 = positive), Uncertainty (1 = positive (low uncertainty) / 7 = negative (high uncertainty)), Price (1 = negative / 7 = positive), Subjective Norm (1 = negative / 7 = positive), Promotion / Certification (1 = negative (little promotion, little help) / 7 = positive), Attitude / Environmental Concern (1 = negative (little concern, less purchase) / 7 = positive)

Appendix U: Regression Analysis, Coefficients (Germany)

Model	Coefficients <sup>a,b</sup>						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Error	Beta			Tolerance	VIF
1	(Constant)	-,083	,230		-,360	,719	
	Uncertainty	-,147	,029	-,148	-5,116	,000	,561
	Attitude / Environment al Concern	,223	,043	,200	5,188	,000	,318
	Promotion / Certification	,143	,033	,138	4,325	,000	,464
	Value / Accessibility	,303	,046	,226	6,553	,000	,397
	Subjective Norm	,176	,028	,188	6,232	,000	,520
	Price	,239	,030	,217	7,932	,000	,628
	Availability	,074	,026	,071	2,837	,005	,757
							1,320

1. Country = Germany
2. Dependent Variable: purchase Intention (1 = low / 7 high)

Appendix V: Independent T-test, Group Statistics (Purchase Intention)

Group Statistics					
	Country	N	Mean	Std. Deviation	Std. Error Mean
Purchase Intention	South Africa	692	5,7543	,99896	,03797
	Germany	603	5,1216	1,24942	,05088

Appendix W: Independent T-test, Levene's Test, Confidence Intervals (Purchase Intention)

**Independent Samples Test**

		Levene's Test for Equality of Variances					t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean	Std. Error	95% Confidence Interval of the Difference		
									Difference	Lower	Upper
Purchase Intention	Equal variances assumed	14,290	,000	10,118	1293	,000	,63272	,06254	,51004	,75540	
	Equal variances not assumed			9,966	1148,902	,000	,63272	,06349	,50815	,75729	

Appendix X: Independent T-test, One-Sample Statistics (Product Types, overall)

**One-Sample Statistics**

	N	Mean	Std. Deviation	Std. Error Mean
I would consider buying a t-shirt made of recycled materials in the near future.	1295	5,41	1,402	,039
I would consider buying a mobile phone made of recycled materials at my next purchase.	1295	4,75	1,642	,046
I would consider buying toilet paper made of recycled materials in the near future.	1295	5,55	1,588	,044

Appendix Y: Independent T-test, One-Sample Test, Confidence Intervals (Product Types, overall)

**One-Sample Test**

	Test Value = 0							
			Significance		Mean Difference	95% Confidence Interval of the Difference		
	One- Sided	Two- Sided	p	p		Lower	Upper	
	t	df						
I would consider buying a t-shirt made of recycled materials in the near future.	138,770	1294	,000	,000	5,408	5,33	5,48	
I would consider buying a mobile phone made of recycled materials at my next purchase.	104,071	1294	,000	,000	4,749	4,66	4,84	
I would consider buying toilet paper made of recycled materials in the near future.	125,719	1294	,000	,000	5,547	5,46	5,63	

Appendix Z: Independent T-test, Group Statistics (Product Types, South Africa and Germany)

**Group Statistics**

	Country	N	Mean	Std. Deviation	Std. Error Mean
Purchase Intention T-Shirt	South Africa	692	1,7197	,44949	,01709
	Germany	603	1,3499	,47734	,01944
Purchase Intention Mobile Phone	South Africa	692	1,4812	,50001	,01901
	Germany	603	1,2504	,43361	,01766
Purchase Intention Toilet Paper	South Africa	692	1,6691	,47089	,01790
	Germany	603	1,5721	,49518	,02017

Appendix AA: Independent T-test, Levene's Test, Confidence Intervals (Product Types, South Africa and Germany)

**Independent Samples Test**

		Levene's Test for Equality of Variances			t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2- taile		Mean Differen ce	Std. Error Differen ce	Lower	Upper
						d)	nce				
Purchase Intention T- Shirt	Equal variances assumed	28,056	,000	14,345	1293	,000	,36974	,02577	,31917	,42030	
	Equal variances not assumed			14,286	1244,443	,000	,36974	,02588	,31896	,42051	
Purchase Intention Mobile	Equal variances assumed	224,760	,000	8,810	1293	,000	,23080	,02620	,17940	,28219	
Phone	Equal variances not assumed			8,896	1292,972	,000	,23080	,02594	,17990	,28170	
	Equal variances not assumed										
Purchase Intention Toilet Paper	Equal variances assumed	44,246	,000	3,607	1293	,000	,09694	,02687	,04422	,14965	
	Equal variances not assumed			3,595	1248,926	,000	,09694	,02696	,04404	,14984	

Appendix BB: Target Groups, Overall

### Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Gender * Purchase Intention Target Groups	1290	100,0%	0	0,0%	1290	100,0%
Age * Purchase Intention Target Groups	1290	100,0%	0	0,0%	1290	100,0%
Net household income * Purchase Intention Target Groups	1290	100,0%	0	0,0%	1290	100,0%
Level of Education * Purchase Intention Target Groups	1290	100,0%	0	0,0%	1290	100,0%

### Crosstab

			Purchase Intention Target Groups		
					medium / low / no purchase intention
			high purchase intention	purchase intention	
Gender	male	Count	223	311	534
		% within Gender	41,8%	58,2%	100,0%
		% within Purchase Intention Target Groups	39,6%	42,8%	41,4%
	female	Count	340	416	756
		% within Gender	45,0%	55,0%	100,0%
		% within Purchase Intention Target Groups	60,4%	57,2%	58,6%
Total	Count	563	727	1290	
	% within Gender	43,6%	56,4%	100,0%	
	% within Purchase Intention Target Groups	100,0%	100,0%	100,0%	

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1,314 <sup>a</sup>	1	,252		
Continuity Correction <sup>b</sup>	1,186	1	,276		
Likelihood Ratio	1,315	1	,251		
Fisher's Exact Test				,255	,138
Linear-by-Linear Association	1,313	1	,252		
N of Valid Cases	1290				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 233,06.

b. Computed only for a 2x2 table

### Crosstab

			Purchase Intention Target Groups		Total
			high purchase intention	medium / low / no purchase intention	
Age	18 - 24	Count	89	118	207
		% within Age	43,0%	57,0%	100,0%
		% within Purchase Intention Target Groups	15,8%	16,2%	16,0%
		Count	179	182	361
	25 - 34	% within Age	49,6%	50,4%	100,0%
		% within Purchase Intention Target Groups	31,8%	25,0%	28,0%
		Count	155	172	327
	35 - 49	% within Age	47,4%	52,6%	100,0%
		% within Purchase Intention Target Groups	27,5%	23,7%	25,3%
		Count	86	139	225
	50 - 64	% within Age	38,2%	61,8%	100,0%
		% within Purchase Intention Target Groups	15,3%	19,1%	17,4%
		Count	54	116	170
	65 and older	% within Age	31,8%	68,2%	100,0%
		% within Purchase Intention Target Groups	9,6%	16,0%	13,2%
		Count	563	727	1290
Total		% within Age	43,6%	56,4%	100,0%
		% within Purchase Intention Target Groups	100,0%	100,0%	100,0%
		Count			

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	19,534 <sup>a</sup>	4	,001
Likelihood Ratio	19,823	4	,001
Linear-by-Linear Association	10,040	1	,002
N of Valid Cases	1290		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 74,19.

### Crosstab

		Purchase Intention Target Groups			Total
		high purchase intention	medium / low / no purchase intention		
Net household income	0 - R 8,000 / 0 - € 1,250	Count	80	125	205
		% within Net household income	39,0%	61,0%	100,0%
		% within Purchase Intention Target Groups	14,2%	17,2%	15,9%
	R 8,001 - 18,000 / € 1,250 - € 2,000	Count	135	172	307
		% within Net household income	44,0%	56,0%	100,0%
		% within Purchase Intention Target Groups	24,0%	23,7%	23,8%
	R 18,001 - 37,000 / € 2,001 - € 3,000	Count	173	198	371
		% within Net household income	46,6%	53,4%	100,0%
		% within Purchase Intention Target Groups	30,7%	27,2%	28,8%
	R 37,001 - 63,000 / € 3,001 - € 5,000	Count	121	149	270
		% within Net household income	44,8%	55,2%	100,0%
		% within Purchase Intention Target Groups	21,5%	20,5%	20,9%
more than R 63,000 / more than € 5,001	Count	54	83	137	
	% within Net household income	39,4%	60,6%	100,0%	
	% within Purchase Intention Target Groups	9,6%	11,4%	10,6%	
Total	Count	563	727	1290	
	% within Net household income	43,6%	56,4%	100,0%	
	% within Purchase Intention Target Groups	100,0%	100,0%	100,0%	

## Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4,284 <sup>a</sup>	4	,369
Likelihood Ratio	4,303	4	,367
Linear-by-Linear Association	,191	1	,662
N of Valid Cases	1290		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 59,79.

## Crosstab

		Purchase Intention Target Groups		Total
		high purchase intention	medium / low / no purchase intention	
Level of Education	Primary / high school	Count	120	
	Some higher education	% within Level of Education	31,1%	68,9%
	University degree or similar	% within Purchase Intention Target Groups	21,3%	36,6%
		Count	160	26,9%
		% within Level of Education	46,1%	53,9%
		% within Purchase Intention Target Groups	28,4%	25,7%
		Count	283	557
		% within Level of Education	50,8%	49,2%
		% within Purchase Intention Target Groups	50,3%	37,7%
Total		Count	563	1290
		% within Level of Education	43,6%	56,4%
		% within Purchase Intention Target Groups	100,0%	100,0%

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	37,221 <sup>a</sup>	2	,000
Likelihood Ratio	37,964	2	,000
Linear-by-Linear Association	34,472	1	,000
N of Valid Cases	1290		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 151,44.

Appendix CC: Target Groups South Africa and Germany

### Case Processing Summary

Country		Cases				Total	
		Valid		Missing			
		N	Percent	N	Percent	N	Percent
South Africa	Gender * Purchase Intention Target Groups	691	100,0%	0	0,0%	691	100,0%
	Age * Purchase Intention Target Groups	691	100,0%	0	0,0%	691	100,0%
	Net household income * Purchase Intention Target Groups	691	100,0%	0	0,0%	691	100,0%
	Level of Education * Purchase Intention Target Groups	691	100,0%	0	0,0%	691	100,0%
Germany	Gender * Purchase Intention Target Groups	599	100,0%	0	0,0%	599	100,0%
	Age * Purchase Intention Target Groups	599	100,0%	0	0,0%	599	100,0%
	Net household income * Purchase Intention Target Groups	599	100,0%	0	0,0%	599	100,0%
	Level of Education * Purchase Intention Target Groups	599	100,0%	0	0,0%	599	100,0%

### Crosstab

Country	Gender	male		Purchase Intention Target Groups		Total
				high purchase intention	medium / low / no purchase intention	
South Africa	Gender	male	Count	131	100	231
			% within Gender	56,7%	43,3%	100,0%
			% within Purchase Intention Target Groups	35,8%	30,8%	33,4%
		female	Count	235	225	460
			% within Gender	51,1%	48,9%	100,0%
			% within Purchase Intention Target Groups	64,2%	69,2%	66,6%
	Total		Count	366	325	691
			% within Gender	53,0%	47,0%	100,0%
			% within Purchase Intention Target Groups	100,0%	100,0%	100,0%
Germany	Gender	male	Count	92	211	303
			% within Gender	30,4%	69,6%	100,0%
			% within Purchase Intention Target Groups	46,7%	52,5%	50,6%
		female	Count	105	191	296
			% within Gender	35,5%	64,5%	100,0%
			% within Purchase Intention Target Groups	53,3%	47,5%	49,4%
	Total		Count	197	402	599
			% within Gender	32,9%	67,1%	100,0%
			% within Purchase Intention Target Groups	100,0%	100,0%	100,0%

### Chi-Square Tests

Country		Value	df	Asymptotic Significance (2- sided)	Exact	
					Exact Sig. (2- sided)	Sig. (1- sided)
South Africa	Pearson Chi-Square	1,952 <sup>a</sup>	1	,162		
	Continuity Correction <sup>b</sup>	1,733	1	,188		
	Likelihood Ratio	1,956	1	,162		
	Fisher's Exact Test				,170	,094
	Linear-by-Linear Association	1,949	1	,163		
	N of Valid Cases	691				
Germany	Pearson Chi-Square	1,771 <sup>c</sup>	1	,183		
	Continuity Correction <sup>b</sup>	1,547	1	,214		
	Likelihood Ratio	1,772	1	,183		
	Fisher's Exact Test				,193	,107
	Linear-by-Linear Association	1,768	1	,184		
	N of Valid Cases	599				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 108,65.

b. Computed only for a 2x2 table

c. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 97,35.

### Crosstab

Country	Age			Purchase Intention Target Groups		
				high purchase intention	medium / low / no purchase intention	Total
South Africa	18 - 24	Count		78	79	157
		% within Age		49,7%	50,3%	100,0%
		% within Purchase Intention Target Groups		21,3%	24,3%	22,7%
	25 - 34	Count		146	125	271
		% within Age		53,9%	46,1%	100,0%
		% within Purchase Intention Target Groups		39,9%	38,5%	39,2%
	35 - 49	Count		106	90	196
		% within Age		54,1%	45,9%	100,0%
		% within Purchase Intention Target Groups		29,0%	27,7%	28,4%
	50 - 64	Count		31	27	58
		% within Age		53,4%	46,6%	100,0%
		% within Purchase Intention Target Groups		8,5%	8,3%	8,4%
	65 and older	Count		5	4	9
		% within Age		55,6%	44,4%	100,0%
		% within Purchase Intention Target Groups		1,4%	1,2%	1,3%
	Total	Count		366	325	691
		% within Age		53,0%	47,0%	100,0%
		% within Purchase Intention Target Groups		100,0%	100,0%	100,0%
Germany	18 - 24	Count		11	39	50
		% within Age		22,0%	78,0%	100,0%
		% within Purchase Intention Target Groups		5,6%	9,7%	8,3%
	25 - 34	Count		33	57	90
		% within Age		36,7%	63,3%	100,0%
		% within Purchase Intention Target Groups		16,8%	14,2%	15,0%
	35 - 49	Count		49	82	131
		% within Age		37,4%	62,6%	100,0%

### Chi-Square Tests

Country		Value	df	Asymptotic
				Significance (2-sided)
South Africa	Pearson Chi-Square	,897 <sup>a</sup>	4	,925
	Likelihood Ratio	,896	4	,925
	Linear-by-Linear Association	,480	1	,489
	N of Valid Cases	691		
Germany	Pearson Chi-Square	4,918 <sup>b</sup>	4	,296
	Likelihood Ratio	5,083	4	,279
	Linear-by-Linear Association	,001	1	,982
	N of Valid Cases	599		

a. 2 cells (20,0%) have expected count less than 5. The minimum expected count is 4,23.

b. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 16,44.

### Crosstab

Country	Net household income		Purchase Intention Target Groups			Total	
			get Groups		medium / low / no purchase intention		
			high purchase intention	low / no purchase intention			
South Africa	0 - R 8,000 / 0 - € 1,250	Count % within Net household income	56	47,9%	61	117	
		% within Purchase Intention	15,3%	18,8%	16,9%		
	R 8,001 - 18,000 / € 1,250 - € 2,000	Target Groups Count % within Net household income	98	53,0%	87	185	
		% within Purchase Intention	26,8%	26,8%	26,8%		
	R 18,001 - 37,000 / € 2,001 - € 3,000	Target Groups Count % within Net household income	119	52,4%	108	227	
		% within Purchase Intention	47,6%	47,6%	47,6%		

		% within Purchase Intention Target Groups	32,5%	33,2%	32,9%
R 37,001 - 63,000 / € 3,001 - € 5,000	Count	68	45	113	
	% within Net household income	60,2%	39,8%	100,0%	
	% within Purchase Intention Target Groups	18,6%	13,8%	16,4%	
more than R 63,000 / more than € 5,001	Count	25	24	49	
	% within Net household income	51,0%	49,0%	100,0%	
	% within Purchase Intention Target Groups	6,8%	7,4%	7,1%	
Total	Count	366	325	691	
	% within Net household income	53,0%	47,0%	100,0%	
	% within Purchase Intention Target Groups	100,0%	100,0%	100,0%	
Germany	Net household income	0 - R 8,000 / 0 - € 1,250	Count % within Net household income	24 27,3%	64 72,7%
			% within Purchase Intention Target Groups	12,2%	14,7%
	R 8,001 - 18,000 / € 1,250 - € 2,000	Count	37	85	122
		% within Net household income	30,3%	69,7%	100,0%
		% within Purchase Intention Target Groups	18,8%	21,1%	20,4%
	R 18,001 - 37,000 / € 2,001 - € 3,000	Count	54	90	144
		% within Net household income	37,5%	62,5%	100,0%

		% within Purchase Intention Target Groups	27,4%	22,4%	24,0%
R 37,001 - 63,000 / € 3,001 - € 5,000	Count	53	104	157	
	% within Net household income	33,8%	66,2%	100,0%	
	% within Purchase Intention Target Groups	26,9%	25,9%	26,2%	
more than R 63,000 / more than € 5,001	Count	29	59	88	
	% within Net household income	33,0%	67,0%	100,0%	
	% within Purchase Intention Target Groups	14,7%	14,7%	14,7%	
Total	Count	197	402	599	
	% within Net household income	32,9%	67,1%	100,0%	
	% within Purchase Intention Target Groups	100,0%	100,0%	100,0%	

### Chi-Square Tests

Country		Value	df	Asymptotic
				Significance (2-sided)
South Africa	Pearson Chi-Square	3,683 <sup>a</sup>	4	,451
	Likelihood Ratio	3,702	4	,448
	Linear-by-Linear Association	1,472	1	,225
	N of Valid Cases	691		
Germany	Pearson Chi-Square	3,061 <sup>b</sup>	4	,548
	Likelihood Ratio	3,078	4	,545
	Linear-by-Linear Association	,968	1	,325
	N of Valid Cases	599		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 23,05.

b. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 28,94.

### Crosstab

Country	Level of Education	Primary / high school	Count	Purchase Intention		Total
				Target Groups high purchase intention	Target Groups medium / low / no purchase intention	
South Africa	Primary / high school	% within Level of Education	42	44	86	
			48,8%	51,2%	100,0%	
			11,5%	13,5%	12,4%	
	Some higher education	% within Purchase Intention Target Groups	Count	100	90	190
			% within Level of Education	52,6%	47,4%	100,0%
			% within Purchase Intention Target Groups	27,3%	27,7%	27,5%
	University degree or similar	% within Level of Education	Count	224	191	415
			% within Purchase Intention Target Groups	54,0%	46,0%	100,0%
			% within Purchase Intention Target Groups	61,2%	58,8%	60,1%
	Total	Count	366	325	691	
		% within Level of Education	53,0%	47,0%	100,0%	
		% within Purchase Intention Target Groups	100,0%	100,0%	100,0%	
Germany	Primary / high school	Count	78	222	300	
			% within Level of Education	26,0%	74,0%	100,0%
			% within Purchase Intention Target Groups	39,6%	55,2%	50,1%
	Some higher education	% within Level of Education	60	97	157	
			% within Purchase Intention Target Groups	38,2%	61,8%	100,0%

	% within Purchase Intention Target Groups	30,5%	24,1%	26,2%
University degree or similar	Count	59	83	142
	% within Level of Education	41,5%	58,5%	100,0%
	% within Purchase Intention Target Groups	29,9%	20,6%	23,7%
Total	Count	197	402	599
	% within Level of Education	32,9%	67,1%	100,0%
	% within Purchase Intention Target Groups	100,0%	100,0%	100,0%

### Chi-Square Tests

Country		Value	df	Asymptotic
				Significance (2-sided)
South Africa	Pearson Chi-Square	,767 <sup>a</sup>	2	,682
	Likelihood Ratio	,766	2	,682
	Linear-by-Linear Association	,697	1	,404
	N of Valid Cases	691		
Germany	Pearson Chi-Square	13,295 <sup>b</sup>	2	,001
	Likelihood Ratio	13,336	2	,001
	Linear-by-Linear Association	12,277	1	,000
	N of Valid Cases	599		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 40,45.

b. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 46,70.

### Appendix DD: Descriptive Statistics, Mean values of Factors (South Africa and Germany)

#### Descriptive Statistics

Country		N	Minimum	Maximum	Mean	Std. Deviation
South Africa	Uncertainty	691	1,00	6,45	3,0237	1,18203
	Attitude / Environmental Concern	691	3,00	7,00	6,1493	,77414
	Promotion / Certification	691	3,17	7,00	5,8157	,83635
	Value / Accessibility	691	2,13	7,00	5,2717	,92413
	Subjective Norm	691	1,67	7,00	5,3613	1,18302
	Price	691	1,00	7,00	4,3271	1,19073

	Availability	691	1,00	7,00	4,5731	1,23981
	Valid N (listwise)	691				
Germany	Uncertainty	599	1,00	7,00	3,1495	1,26725
	Attitude / Environmental Concern	599	1,00	7,00	5,6909	1,11571
	Promotion / Certification	599	1,00	7,00	4,8959	1,20259
	Value / Accessibility	599	1,00	7,00	4,9581	,93295
	Subjective Norm	599	1,00	7,00	4,7590	1,33653
	Price	599	1,00	7,00	4,4168	1,13346
	Availability	599	1,00	7,00	4,1347	1,19800
	Valid N (listwise)	599				

## **Statement of Affirmation**

I hereby declare that all parts of this thesis were exclusively prepared by me, without using resources other than those stated above. The thoughts taken directly or indirectly from external sources are appropriately annotated.

This thesis or parts of it were not previously submitted to any other academic institution and have not yet been published.

Dornbirn, 8 July 2022

Carina Lochner