"Is the Stage Yours?"
Shedding Light on the Effect of Co-Creation Stages on Customers' Green and Functional Trust

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ABSTRACT

Title: "Is the Stage yours?" Shedding Light on the Effect of Co-Creation Stages on Customers' Green and Functional Trust

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Although consumers show an increased interest in making greener choices at the purchase decision, their actual purchasing behavior lags. Previous research has highlighted a lack of trust in green products as a possible explanation for this consumption discrepancy. As co-creation is based on characteristics such as openness, dialogue, and transparency, this paper investigates whether this innovation approach could be a way to increase green trust and functional trust in green products. The results showed a positive mediation effect of green trust between green products and consumers' purchase intention. Furthermore, the results showed an interaction effect between product greenness and co-creation, highlighting the effectiveness of co-creation in increasing functional trust. Since green products are perceived as less effective, innovation managers can complement their innovation process with co-creation when trying to increase functional trust in new green products.

Furthermore, the paper examined whether the specific communication of the stage in which co-creation took place has an impact on the observation of consumers' green trust and functional trust. The results showed that consumers have a higher level of functional trust in green products that have been co-created at the launch stage compared to products that have been created by professionals.

Keywords: Co-Creation, Green products, Purchase Intention, Green Trust, Functional Trust, Co-Creation stages

SUMÁRIO

Título: O palco é seu? Esclarecendo o Efeito das Fases de Co-Criação na Confiança Verde e Funcional dos Clientes

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Embora os consumidores demonstrem um interesse crescente em fazer escolhas mais ecológicas aquando da decisão de compra, o seu comportamento de compra efectivo fica aquém. Estudos anteriores destacaram a falta de confiança nos produtos ecológicos como uma possível explicação para esta discrepância no consumo. Uma vez que a co-criação se baseia em características como a abertura, o diálogo e a transparência, este documento investiga se esta abordagem de inovação pode ser uma forma de aumentar a confiança ecológica e a confiança funcional nos produtos ecológicos. Os resultados revelaram um efeito de mediação positivo da confiança ecológica entre os produtos ecológicos e a intenção de compra dos consumidores. Além disso, os resultados revelaram um efeito de interacção entre o carácter ecológico do produto e a co-criação, salientando a eficácia da co-criação no aumento da confiança funcional. Uma vez que os produtos verdes são considerados menos eficazes, os gestores da inovação podem complementar o seu processo de inovação com a co-criação quando tentam aumentar a confiança funcional em novos produtos verdes.

Além disso, o documento examinou se a comunicação específica da fase em que a co-criação teve lugar tem um impacto na observação da confiança verde e da confiança funcional dos consumidores. Os resultados mostraram que os consumidores têm um nível mais elevado de confiança funcional nos produtos ecológicos que foram co-criados na fase de lançamento, em comparação com os produtos que foram criados por profissionais.

Palavras-chave: Co-criação, Produtos verdes, Intenção de compra, Confiança verde, Confiança funcional, Fases de co-criação

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Abbreviations

CI – Confidence interval

df – degrees of freedom

F – F-statistics

M – Mean

N – Number of cases

P – p-value

SD – Standard Deviation

CHAPTER 1: INTRODUCTION

In 2022, Europe recorded the hottest summer in the past 30 years (Copernicus Climate Change Service (C3S), 2023). Extreme heat is gradually starting to threaten the human environment and human health. Companies and customers alike are beginning to take responsibility for reducing the environmental footprint by either producing or consuming more sustainably. The increased interest in green products can be therefore taken as a sign of consumers' increased awareness of conscious lifestyles and consumption behavior (Chernev & Blair, 2021). According to a recent study, customers prefer buying products from companies, which show environmental responsibility (Castro-González et al., 2021). Motivated by these circumstances, companies are now eager to push the current product portfolio in a greener direction for example by introducing new green products (Chen, 2008), thereby demonstrating an honest commitment to sustainability (Chang, 2019). Green innovation is used by many companies as a means of achieving both environmental protection (Castellacci & Lie, 2017) and economic growth (Chen, 2010; Karimi Takalo et al., 2021).

However, recent consumer studies reveal a serious discrepancy between customers' buying intentions and actual buying behavior (Gleim & Lawson, 2014). This fact has emerged as a frequently cited topic in the literature and refers to as the "green gap". The reasons behind the green gap are various: research in this field found evidence, that customers perceive green products as less functional (Lin & Chang, 2012), and of less quality (Newman et al., 2014). At the same time, green features also pose a liability in some cases, as customers assume that the aspect of greenness has negative trade-off consequences on a product's functional features (Luchs et al., 2010).

Many companies have realized the opportunities presented by green products. Being perceived as green positively influences brand equity (Chen, 2010) which holds the opportunity to benefit from higher margins, since some customers tend to display a higher purchase intention and a higher willingness to pay for green products (Haws et al., 2014). This tempts companies to be associated with green attributes. The term "greenwashing" refers to the deliberate misuse of information about a company's sustainability performance to imply a sense of sustainability among customers (Chen & Chang, 2013). As companies greenwashing activities increase, so does customer distrust of green products (Goh & Balaji, 2016). In fact, according to recent studies, consumers are unsure about which sources of information they should trust (Chen & Chang, 2013). This raises consumers' green skepticism about green claims, which lowers the purchase intention of consumers consequently (Goh & Balaji, 2016;

Leonidou & Skarmeas, 2017). Given these circumstances, companies seek ways to decrease mistrust (Delgado-Ballester & Luis Munuera-Alemán, 2005). To enhance consumer trust, companies have begun welcoming customers to participate in the development of new products (Prahalad & Ramaswamy, 2004a).

Co-creation may be considered a new paradigm for innovation that has attracted a lot of attention in recent years. Research agrees that the integration of customers into the development process of innovation can enhance new product market performance (Chang & Taylor, 2016; Lüthje, 2004; Poetz & Schreier, 2012). Also, successful brands like Adidas, Threadless, and Muji show the advantages that can be gained by including customers in the whole innovation process such as the joint generation of ideas, or the development of prototypes. Co-creation is based on transparency and open dialogue, which encourages consumers' willingness to trade needs-related information in exchange for a more needs-aligned product (Prahalad & Ramaswamy, 2004a). The benefits of co-creation go beyond actively participating consumers and reach observing customers who do not participate in co-creation but buy the product and thus represent the market. Existing literature highlights that observing customers perceive companies that co-create as more customer-centric and prefer to buy from these companies as those products are also perceived as more effective (Dahl et al., 2015; Fuchs & Schreier, 2011).

Since consumers' purchase decisions are based on companies' claims, companies need to find ways to build trust in green products (Schmuck et al., 2018). Companies' greenwashing activities undermine customers' perceived green trust in green products (Choi et al., 2007). Compared to conventional products, trust is even more important in the field of green products since green features are sometimes less readily apparent, more difficult to verify, and thus necessitate a higher level of trust from observing customers (Arnold, 2017). Since green products are expected to fulfill a utilitarian purpose and customers tend to believe that green attributes negatively impact the functional performance of a product, companies need also need to allay those consumers' concerns (Luchs et al., 2010).

This paper hypothesizes that characteristics like openness and open communication of the co-creation practice (Prahalad & Ramaswamy, 2004) are a strategy to address the lack of customers' trust in green products (Arnold, 2017). Even if customers do not actively participate in the co-creation process, previous research has shown that customers feel empowered by actively participating customers and therefore prefer to buy from these brands (Dahl et al., 2015). Combining these findings with the Commitment Trust Theory, this paper suggests that

co-creation can foster trust by making it easier to anticipate the intentions of others (Morgan & Hunt, 1994). The author predicts that observing customers will show greater green trust in co-created green products when compared with internally developed products because of an increased feeling that actively participating customers share similar intentions and green values. It is suggested that the empowerment effect of co-creation can also be applied to functional trust, thereby alleviating previous findings highlighting that green products are perceived as less effective (Lin & Chang, 2012).

1.1 Background and problem statement

Joining the debate on how companies can introduce green products more efficiently, this study investigates whether co-creation can constitute a promising approach to achieving green trust and functional trust in green products. Taking into consideration, that customers need to believe the green claim of a product (Schmuck et al., 2018) and that customers expect that the green product fulfills the intended utilitarian purpose (Luchs et al., 2010), this paper more specifically analyzes, if co-creation can increase both types of trust in green products. Based on the inherent characteristics of co-creation, it is hypothesized that this innovation approach can enhance trust in green products, which leads to a higher purchase intention. More specifically, it is predicted that both functional and green trust will mediate the positive effect of co-created green products on purchase intention. On a theoretical basis, the author aims firstly to explore the promising relationship between green products and co-creation, and secondly to provide a more detailed picture of co-creation in the sustainability area, as this dissertation is – to the best of the author's knowledge – the first to consider the differentiation of co-creation stages, namely the ideation stage, product development stage, and launch stage. This will extend the existing knowledge in the literature by questioning when co-creation has the most significant impact on observing customers' perceived trust in green products. In addition, this paper aims to provide managers with first-hand information on when to invite customers into the green innovation development process. In short, this dissertation is centered on the main research questions: *Can co-creation improve green trust and functional trust to boost customers' purchase intentions for green products?* To provide an outlook on different outcome variables, further questions are constructed:

1) What is the impact of communicating that a product was co-created on consumers' purchase intention?
2) How does the communication that a product has been jointly developed affect consumers' functional trust and green trust?

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3) Has functional trust and green trust the same mediating effect on consumers' purchase intention?

4) Does the degree of observing consumers' green and functional trust depend on the stage in which co-creation took place?

1.2 Theoretical Framework
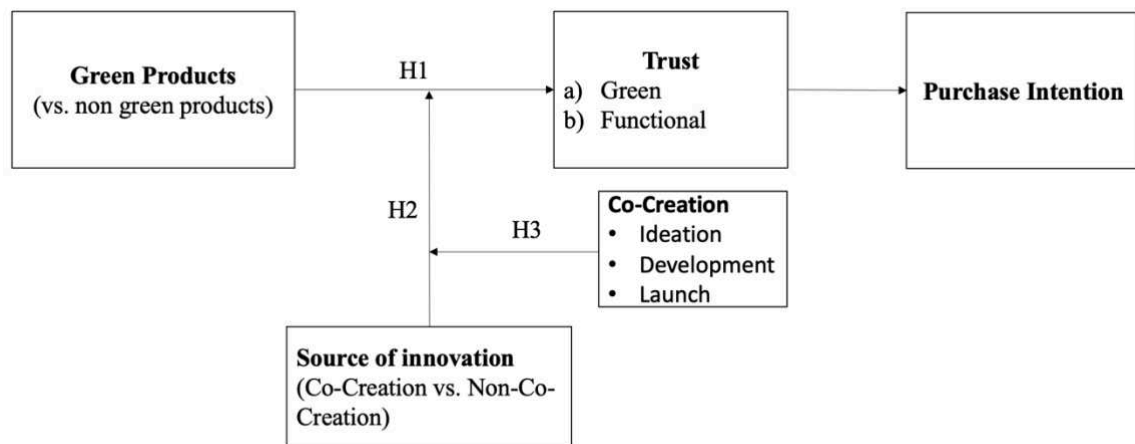
Figure 1: *Conceptual Model*

1.3 Thesis structure

The second chapter of this thesis is dedicated to an academic literature review of green products and co-creation to provide a foundation for the development of the hypothesis. Chapter three focuses on the methodology used to collect the data, which is then analyzed. The discussion of the results is presented in chapter four. Chapter five provides academic and managerial implications and an outlook for further research in this area.

CHAPTER 2: LITERATURE REVIEW

2.1 Green Marketing

With growing concern about the environment, consumers and companies seek new ways to decrease the environmental footprint by either consuming or producing in a more sustainable way. Sustainability is considered one of the main motivations for innovation nowadays (Dangelico & Vocalelli, 2017), emerging as a core interest for many companies. The Word Commission on Environment and Development defines sustainability as "*the development that meets the needs of the present without compromising the ability of future generations to meet their needs*" (World Commission on Environment and Development, 1987, p. 1). However, sustainability is not synonymous with environmental responsibility. In line with the triple-bottom approach, sustainability comprises three dimensions: environmental, economic, and social (Elkington, 1999). Throughout this paper, sustainability will be treated from an ecological perspective.

Companies' strategies aim to improve environmental performance (Chang, 2019). With the growing demand for green products, green marketing has become a priority in the marketing mix, to respond to customers' increased awareness (Chen & Chang, 2013). Green marketing, first mentioned in the late 1970s is a concept, that embraces the four cornerstones of marketing (4Ps) aiming to meet consumers' consciousness (Henion & Kinnear, 1976), and influence consumers' purchasing behavior (Jain & Kaur, 2004). For this article, green marketing is defined as a marketing approach in which all activities are aimed at reducing the negative environmental impact of existing products and promoting new, more environmentally friendly products (Peattie, 2001). Furthermore, green marketing can be understood as strategies and activities of companies that lead to the generation of profits while reducing the negative impact on the environment from the production and consumption of products (Leonidou et al., 2013).

Companies have recognized the value of green marketing. Green marketing allows companies to create a point of differentiation, resulting in a competitive advantage (Chen, 2008; Lin et al., 2017). Besides seeing green marketing as a key marketing strategy to reduce competitive pressure (Zameer et al., 2020), green marketing can also help to realize higher margins, as consumers show a higher willingness to pay for the companies' offerings (Delgado-Ballester & Luis Munuera-Alemán, 2005). Research shows that customers generally perceive a company's positioning better when the company succeeds in demonstrating green attribute efforts in new products (Bashir et al., 2020), increasing consumer brand loyalty (Martínez, 2015) and positive word-of-mouth (Chaudhuri & Holbrook, 2001).

2.2 Green Marketing Drawbacks

The growing demand for green products over the past years is one of the most evident indication of consumers' rising environmental consciousness (Chernev & Blair, 2021). Companies are reacting to this trend with the introduction of more environmentally friendly product innovations (Luchs et al., 2010). Although research suggests that consumers are generally more willing to pay for sustainable goods (Chen, 2008), "being green" is not a guarantee of a company's success. In some cases, sustainability represents a liability for companies rather than a favorable purchasing argument for consumers. In fact, Luchs and collaborators (2010) found evidence, that in product categories, where strength-related attributes are valued (e.g., car tires), sustainability may negatively influence consumers' preferences. In addition, Newman and collaborators (2014) pointed out that customers show a lower purchase intention if the green product attribute is regarded as intended rather than an unintentional one that happens as part of the innovation process. Newman and his colleagues argue that consumers are inclined to think that the quality or the performance will suffer in favor of the environmental advantages (Newman et al., 2014). Similarly, the literature suggests that green advertising can harm consumer attitudes toward a company, especially for companies with negative environmental performance (Nyilasy et al., 2014). Another related body of literature found evidence, that green products are sometimes perceived as less effective, compared to conventional pendants (Lin et al., 2017).

2.3 Trust

Trust is a subject that receives a significant amount of focus in both literature and business because it is considered to be one of the most desirable properties in a connection between customers and a company (Delgado-Ballester & Luis Munuera-Alemán, 2005). Trust is likely to arise, when "one party has confidence in an exchange partner's reliability and integrity" (Morgan & Hunt, 1994, p. 23). In addition to this concept, brand trust implies a high probability that companies operations will produce beneficial outcomes for customers (Delgado-Ballester & Luis Munuera-Alemán, 2005). In line with the literature, brand trust can be considered as consumers' perception that the brand has certain traits that make the company look honest, responsible, or competent (Doney & Cannon, 1997). Trust can directly enhance purchase loyalty (Chaudhuri & Holbrook, 2001), which also positively moderates brand equity (Delgado-Ballester & Luis Munuera-Alemán, 2005).

Green trust can be defined as the customers' belief or expectation, that the environmental performance of the product is credible and benevolent (Chen, 2010). Companies'

greenwashing practices can harm consumers' belief in advertisements and green promises, which in turn lowers the purchase intention (Goh & Balaji, 2016). Companies must reduce their greenwashing practices to reduce customer confusion and perceived risk associated with the purchase decision (Chen & Chang, 2013). Additionally, research in the field of green trust highlights, that consumers' satisfaction with a green product is associated with green trust (Chen & Chang, 2013).

2.4 Green Gap

Greenwashing perceptions explain why researchers revealed an inconsistency between customers' attitudes toward green products and the actual consumption behavior, known as the "green gap" (Gleim & Lawson, 2014; Luchs et al., 2010; Nguyen et al., 2019). Across various business areas, customers are showing consciousness regarding the environment, but this awareness is not reflected in green consumption (Perry & Chung, 2016; Wiederhold & Martinez, 2018). Evidence indicates that although customers show an environmentally conscious attitude, customers perceive consuming in a way consistent with their attitudes as difficult (Young et al., 2009). The reasons for this discrepancy are diverse. While green products are perceived to be less effective than regular products (Lin & Chang, 2012), other research highlights that the fact that green products are more expensive may lead to this behavioral gap (Luchs et al., 2010). Particularly the perceived consumer effectiveness is low. Perceived consumer effectiveness which is the conviction on the part of consumers that their purchasing actions will have a beneficial impact on the environment (Gleim et al., 2013) has received a lot of attention recently while attempting to understand the green gap (Joshi & Rahman, 2019; Nguyen et al., 2019). Furthermore, the weak distribution performance might also widen this green gap (Luchs et al., 2010). This is consistent with the research by Nguyen and colleagues (2019), which explores the conditions under which the gap can be closed. The authors' findings highlight the moderating role of green product availability. Nguyen and collaborators argue that if green products are easier to obtain, customers will feel that their actions are having a direct environmental impact (Nguyen et al., 2019).

2.5 Greenwashing

Having recognized the potential of consumers' growing environmental consciousness, companies try to meet this demand with new green products. Past research indicates, that labeling a company's operations or products as "green" can constitute a competitive advantage (Chen et al., 2006). While some companies show a sincere interest in taking environmental responsibility (Chen et al., 2006), others take advantage of green marketing to be perceived as

green (Ha et al., 2022; Laufer, 2003) Authors have labeled this behavior as "Greenwashing". Greenwashing is a practice of deliberately *misleading consumers regarding the environmental actions of a company or the environmental benefits of a product*" (TerraChoice, 2010, p. 1). Greenwashing is related to either the dissemination of false (Gatti et al., 2019) or only positive information (Lyon & Maxwell, 2011) regarding a company's environmental protection efforts. The negative impacts of greenwashing are diverse. Greenwash is negatively related to green brand equity (Ha et al., 2022). Additionally, greenwashing activities can increase consumers' confusion and the risk associated with buying green products, which leads to a lower level of trust in the companies' offerings (Ha et al., 2022).

2.6 Consumer skepticism

Greenwashing activities of companies have resulted in a growing consumer skepticism, towards companies' green offerings (Goh & Balaji, 2016). Skepticism can be defined as the tendency of individuals to distrust others (Obermiller & Spangenberg, 1998), while green skepticism can be understood as consumer doubts about the environmental claims of companies and the performance of green products (Goh & Balaji, 2016). As research on green marketing practices has shown, companies place priority on product-oriented statements that are clear and comprehensible and that emphasize the efficiency of the product in terms of protecting the environment (Leonidou et al., 2011). However, some companies' statements regarding the product's environmental performance are still ambiguous and untrustworthy (Nguyen et al., 2019), which leads to customers' perception, that labeling green is just a marketing trick (Aji & Sutikno, 2015). Since skepticism is likely to affect consumer acceptance of advertising claims (Kim & Lee, 2009), brands need to find ways to build trust and overcome skepticism, to promote their products more effectively. Marketers have found several ways to differentiate green products from regular products (e.g., green color or eco-labeling), but research has shown that this has the opposite effect, with consumers perceiving the product as less efficient (Pancer et al., 2017). The lack of trust in green and the functional effectiveness of green products, caused by green skepticism, is likely to hamper consumers' green purchase decisions (Goh & Balaji, 2016). Consequently, companies need to decrease consumers' mistrust (Delgado-Ballester & Luis Munuera-Alemán, 2005). To build trust with their consumers, companies are starting to involve consumers in their operations, especially in the development of product innovations. (Prahalad & Ramaswamy, 2004a).

2.7 Effect of green claims on Purchase Intention

Consumers indicate an individual preference for environmentally friendly products through their purchasing behavior (Chen & Chang, 2013). As the demand for green products is expected to increase, the literature also shows a growth in greenwashing activities (Ha et al., 2022), as companies seek to profit from selling green products, for which consumers tend to show a higher willingness to pay (Chen, 2008). Green Skepticism caused by greenwashing activities undermines consumers' trust in green products (Choi et al., 2007), which can hamper consumers' purchase intention consequently. To build trust in green products, research suggests that companies first need to decrease the perceived risk associated with green products (Chen & Chang, 2013) and second to reduce greenwashing activities (Ha et al., 2022). Since consumers generally rely on companies' advertising as a basis for their decision (Schmuck et al., 2018), companies need to make clear, truthful, and trustworthy claims (Chen & Chang, 2013; Ha et al., 2022), Trust in green claims is a prerequisite for consumers' purchase decisions (Kim et al., 2016). Research found evidence that green claims that are honest, transparent, and credible are key precursors to building a long-lasting and trusting relationship (Papadas & Avlonitis, 2014). Other findings indicate that customers exhibit a higher willingness to pay if the green claims are trustworthy (Manrai et al., 1997). In a comparable direction, the findings by Goh and Balaji (2016) emphasize that customers' perception a product has a positive impact on the environment can positively influence customers' purchase decisions (Goh & Balaji, 2016).

Besides a lack of green trust, which might be provoked by greenwashing activities of some companies, the literature highlights another reason, which can decrease customers' green purchase behavior. Green products, as already outlined, are associated with being less effective compared to their conventional pendants (Luchs et al., 2010). Customers expect that green products also fulfill a utilitarian function (Lin et al., 2017). Functional trust is the perception that a product can fulfill the task it has been designed for and can be understood as a central element within the purchasing process (Luchs et al., 2010). If consumers experience a lack of confidence in the efficacy of green products, purchase decisions are unlikely to happen (Chen & Chang, 2013). Perceived customer effectiveness can be therefore taken as another prerequisite for green purchase intention (Joshi & Rahman, 2019). If brands can increase customers' perception regarding the functional performance of a green product, this will favorably influence purchasing behavior. According to the discussion presented, it is suggested, that:

Hypothesis 1: The positive influence of the new green product green claim on consumers' purchase intention is positively mediated by consumers' perceived a) green trust and b) functional trust about the new product.

2.8 Co-creation

An emerging literature stream suggests that product co-creation inherently possesses the capability to provide customer-needs-aligned products (Lilien et al., 2002), which functions as a source of competitive advantage. Customers are actively engaging in a close relationship with the firm to co-produce and exchange resources (Vargo & Lusch, 2004). Co-creation can be coined as an innovation practice, where companies leverage customers' knowledge, competencies, and other types of contributions throughout the whole innovation process (e.g., ideation, concept development, launch) to generate new marketable products together with their customers (Dahl et al., 2015). In other words, it is a practice to jointly create value for the company and the customer (Prahalad & Ramaswamy, 2004a). LEGO, Nike or Muji, and other successful companies demonstrate, that drawing on a customer community in new product development (NPD), might constitute a promising approach for creating appealing products and safeguarding a long-term competitive advantage. Indeed, according to research in the field of baby products, co-created products have been assessed as superior compared to products solely created by professionals concerning novelty and customer benefit (Poetz & Schreier, 2012). Chang and Taylor (2016) found evidence, that customer participation in the development phase reduces the time to market which can be understood as a competitive advantage again. In a similar vein, almost all studies back up the idea that internally developed innovations are less desirable commercially than those coming from actively participating customers (von Hippel, 2005). Co-creation with customers enables a firm to access first-hand knowledge about the preferences of customers (Schreier et al., 2012), which results in an increased market fit and lastly in an enhanced success rate of innovation (Carbonell et al., 2009).

In contrast to the traditional assumption that expertise and skills run counter to a positive innovation perception of the common design by users (e.g., Moreau & Herd, 2010; Poetz & Schreier, 2012; Schulze & Hoegl, 2008), Schreier and collaborators (2012) found out, that this assumption does not hold. Common design by customers enhances observing customers' innovation perception. This "innovation effect of user design" drive customers to show a higher purchase intention, an increase in willingness to pay, and a higher likelihood to recommend the firm to other customers. Similar conclusions were made by Costa & Coelho do Vale (2018),

who observed that consumers perceive co-creating brands as more innovative, which increases customers' purchase intentions.

2.9 Effect of Co-Creation on Functional and Green Trust

Recent trends, like the growing consumer skepticism and distrust of marketing activities of end consumers, influence the development of new products (OHern & Rindfleisch, 2010). Co-creation can establish and maintain a relationship of trust between the firm and observing consumers since co-creation inherently requires transparency, ongoing dialogue, and access to information for customers (Prahalad & Ramaswamy, 2004b). Although only a few consumers actively engage in the co-creation process, co-creation can still influence the observing consumers' trust in green products. Observing customers prefer products designed by actively participating customers, which is reflected in a higher purchase intention, a higher willingness to pay, and a higher likelihood to recommend the brand (Schreier et al., 2012). Besides this "innovation effect of user design", observing consumers prefer to buy from companies using the co-creation approach, due to increased identification with the firm (Dahl et al., 2015). Moreover, a social identification with those, actively participating in the co-creation process might enhance the feeling of empowerment and representation (Dahl et al., 2015). It is expected that through the increased transparency and dialogue facilitated by co-creation practices, observing consumers will have more confidence in green products, leading to an increase in purchase intention in the very end.

Customers evaluate the quality of a green product based on the functional promises in addition to the reliability of the green attributes (Chen & Chang, 2012). Research in the field of perceived value, which is coined on the customers' evaluation of the benefits derived from the product (Bolton & Drew, 1991), suggests that consumers are not willing to compromise common product features like quality and performance for green attributes (Chen & Chang, 2012). In other words, green and common product attributes need to go hand in hand. Further, the findings by Chen and Chang (2012) indicate, that companies need to invest in perceived functional value, which can be considered as a key determinant in increasing trust. Since the advantages of co-creation over internally created products have been emphasized in several lab-based studies Dahl et al., 2015; Schreier et al., 2012), co-creation can be seen as an appropriate measure to increase functional trust consequently. Besides the literature, also examples on the market are startling. According to recent research, co-created products outperform internally designed products in the relevant market parameters. (Nishikawa et al., 2013). Additionally, according to another study, the presence of a co-created label can boost a product's market

performance by up to 20% (Nishikawa et al., 2017). According to the literature in this area, consumers infer conclusions from information by connecting it to if-then statements. In other words, co-creation let customers believe that the product better meets their requirements (Schreier et al., 2012). It is suspected that co-creation can improve both functional trust and green trust. Taking these aspects together, the paper hypothesizes that:

Hypothesis 2: Observing consumers display higher a) green trust and b) functional trust in co-created new green products than in new green products developed by professionals.

2.10 Impact of Innovation Co-Creation Stage on Green and Functional Trust

The literature highlights the significance of considering the stage of the development process where consumers have co-create when evaluating the impact of customer engagement (Carbonell et al., 2009). Prior research places a substantial emphasis on determining at which stage, consumer participation has the most effects on innovation performance (Chang & Taylor, 2016; Weber & Heidenreich, 2018). Innovation performance may be assessed from a variety of angles, such as operational, financial, and marketing performance (Chang & Taylor, 2016). Repeated contacts and exchanges between cooperative partners that foster mutual understanding, social identity, and trust between the participants have a significant impact on the performance outcomes (Clauss & Spieth, 2016). In a similar vein, the literature emphasizes that the effectiveness of new product marketing accounts for marketing-specific factors such as customer satisfaction and loyalty in the context of the business-customer relationship (Chang & Taylor, 2016). This leads to the question of at what point in the innovation process co-creation has the greatest impact on observing customers' trust. The participants of the study's survey will be considered as observing customers.

Companies can encourage customers to participate in various stages of the innovation process through co-creation. The literature generally believes that the innovation process may be divided into distinct phases: ideation, concept, development, and launch (Dahl et al., 2015). In line with Chang and Taylor's (2016) study, this research divides the innovation process into three distinct stages, namely ideation (e.g., concept creation), product development (e.g., product design support), and launch (e.g., support as a reference customer) stage, to test whether the stage in which customers were actively involved in the co-creation process has a positive effect of observing customers' green and functional trust. Due to the activities and necessary abilities at each stage being sufficiently different from one another, the ideation, product

development, and launch phases' three-stage classification is also largely acknowledged by the literature (Ernst et al., 2010).

Table 1: *Literature comparison of co-creation research considering stages*

Source	Industry	Stage considered	Outcome Variable	Relevant Findings
Alam, 2006	Financial Service (26)	Fuzzy front-end stages (1) Idea Generation, (2) Idea Screening, (3) Concept Development and Testing	New Service Development Success	Involvement of customers in fuzzy front-end stages can help improve the success rate of new services.
Carbonell et al. 2009	Service (102)	(1) Early Stage (Design of Service Concept, Service Process) (2) Later Stage (Service Testing, Service Launch)	(1) Operational Outcomes (Innovation Speed, Technical Quality) (2) Market Outcomes (Competitive Performance, Sales Performance)	No significant differences regarding the impact of different stages of the development process on Performance measures
Gruner & Homburg, 2000	German machinery industry	(1) Idea Generation, (2) Product Concept Development, (3) Project Definition, (4) Engineering, (5) Prototype Testing, (6) Market Launch	New Product Success (Quality of the new product, Financial New Product success, Quality of New Product Development Process, Inexpensiveness of New Product Ownership)	Prototype Testing>Product Concept Development>Idea Generation>Market Launch
Chang, 2018	Manufacturing (66), Information Technology (75), Service (34), and Other (9) Industries	(1) Ideation, (2) Development, (3) Launch	New product market performance (sales and profit goals and the profitability)	Launch>Ideation>Development
Chang & Taylor, 2016	Meta Analysis	(1) Ideation, (2) Development, (3) Launch	New Product Development (NPD) Performance (Operational, Financial, Marketing)	Launch>Development; Customer participation in (1) ideation and (2) launch stages improve new product financial performance; No significant difference between (1) Ideation and (2) Development Stage
Weber & Heidenreich, 2018	Industrial Goods (154)	(1) Concept Development (2), Product Development, (3) Implementation	(1) Innovation Capabilities, (2) Innovation Success	Implementation stage has a significant impact on Innovation success.

Customer integration throughout the later stages of the innovation co-creation process, such as implementation and launch has been shown to considerably improve the new product development outcome variable according to prior research in this field (Chang, 2019; Chang & Taylor, 2016; Gruner & Homburg, 2000; Weber & Heidenreich, 2018). It is anticipated that including consumers later in the innovation process will increase observing customers' trust in

co-created products. Given the fact, that co-creation in the launch stage comprises tasks such as training other customers, sales support (Weber & Heidenreich, 2018), or testing of prototypes in real-use cases (Chang, 2019), it can be also taken as the stage, where transparency is the highest and anonymity of actively participating customers is the lowest. Previous research has shown that the success of green claims is mainly determined by the degree of authenticity and believability of the claim (Gleim & Lawson, 2014). The author suggests that at no other stage, such as the launch stage, is the trust in green claims of co-created green products as strong as at that time since observing customers regard the claims as not made by the business alone. Furthermore, observing customers will exhibit a higher level of trust grounded on their perception, they can interact with them on a more personal and non-anonymous basis. Perceived transparency will therefore lead to higher green trust in products that are co-created in the launch stage. Customers also show a greater preference for products that have been co-designed, which is the first indication of the user-driven philosophy impact since it indicates that customers believe their needs are better reflected (Dahl et al., 2015). It is assumed that in the launch stage, the contributions made by active participating customers within the co-creation process are the most tangible and comprehensible for observing customers. Subconsciously, this also strengthens functional trust in green products.

Moving from the later stage to the earlier stage of the co-creation process, prior literature highlights the effectiveness of customer integration in the ideation stage (Alam, 2006; Chang, 2019; Gruner & Homburg, 2000). In the ideation stage, customers are invited to provide needs-related information and participate in commenting on and selecting promising ideas (Chang & Taylor, 2016). Observing customers associate co-created products with higher innovation ability because the actively participating belong to the same group and share similar group traits (Schreier et al., 2012). It is predicted that this effect is strongly pronounced in the ideation stage and causes a higher functional trust in green products. Although a significant body of literature stresses the fact, that observing customers can also perceive the innovation ability of actively participating customers as not sufficient (Moreau & Herd, 2010), this paper believes that this does not hold for the ideation stage. Especially companies like Muji which invite customers in their ideation process, provide strong evidence for the effectiveness of co-creation in the ideation stage regarding the marketing performance outcome (Nishikawa et al., 2013, 2017). In addition, it is expected that the reasoning behind observing customers' identification with actively participating customers can also be applied to green trust. In general, products that are

co-created at the ideation stage will be perceived as more trustworthy in terms of green attributes.

Further, it is expected, that promoting the green product as co-created within the development stage will positively influence the relationship between the source of innovation and trust. Throughout the development stage, consumers have the most ability to monitor and control (Morgan & Hunt, 1994) to prevent the firm from engaging in greenwashing practices. This will have an impact on how observing customers perceive the trust of the company's green and functional claims. However, it is suspected that observing customers subconsciously reduces the contribution of actively participating customers in the development stage to a consultative function. Observing customers might perceive the capabilities of the actively participating customers as not sufficient. Consequently, the author hypothesizes that the positive effect of co-creation on trust is the lowest when the product is labeled as co-created in the product development stage.

As mentioned above, the paper hypothesizes that co-creation can be considered a way to increase both functional and green trust in green products. Further, this effect will be intensified by the explicit communication of the stage of co-creation. In line with prior research (Chang, 2019; Chang & Taylor, 2016; Weber & Heidenreich, 2018), it is suspected, that co-creation in the launch stage has the highest impact on trust, followed by the ideation stage and the development stage. Based on the discussion above, it is hypothesized that:

Hypothesis 3: Observing consumers show a higher green trust and functional trust in green products a) co-created in the launch stage compared to the product development stage and b) co-created in the launch stage compared to the ideation stage and c) co-created in the launch stage compared to products created by professionals.

CHAPTER 3: METHODOLOGY

3.1 Research Approach

This study employed an experimental research design to examine a cause-and-effect relationship between the independent and the dependent variable to evaluate the hypotheses made earlier in the body of the paper. Experimental research studies have been used because this type of method is common in the social sciences. The aim of the four studies was to test the influence of two factors (design mode and greenness) on consumers' purchase intention while keeping all other variables under control and constant that can produce the same effect (confounding variables). Both hypotheses were tested across 2 studies. The goal of Study 1 was to confirm the two key hypotheses, which state that both green and functional trust positively mediate the impact of a green product on purchase intention (H1). Secondly, this paper hypothesizes, customers exhibit a higher degree of green and functional trust in co-created green products, compared to internally generated products (H2). Finally, study 2 presents four different scenarios (ideation stage, product development stage, launch stage, and professional scenario) to explore whether the innovation stage in the co-creation process had an impact on green and functional trust (H3).

3.1.1 Pre-survey

The role of perceived product complexity as a boundary condition regarding the effectiveness of co-creation is frequently highlighted in the literature (Chang & Taylor, 2016; Costa & Coelho do Vale, 2018; Schreier et al., 2012). Several research papers found evidence, that co-creation shows high effectiveness in the domain of low-complex products, such as T-Shirts (Schreier et al., 2012). In general, research has shown that leisure products lend themselves to the study of co-creation in terms of market outcome variables such as commercial success (Lüthje, 2004). As the outdoor apparel (e.g., hiking apparel) segment (Patagonia, The North Face) has emerged as a prominent segment that is forcing and promoting a shift towards more sustainable production and the exclusive use of more environmentally friendly product components (Wang et al., 2022), this segment was considered for both studies. Although a significant body of literature agrees that apparel products, in general, are suitable for co-creation, a pre-survey was conducted to validate the appropriateness specifically of the hiking apparel segment for the main studies. In addition to complexity, much attention has been paid in previous research to other boundary conditions, especially concerning the labeling of a product. On the one hand, sustainability can be in some cases a liability, inhibiting positive outcomes of green products (Luchs et al., 2010). On the other hand, labeling a product as co-

created can increase market performance as consumers feel that the product better meets their needs (Nishikawa et al., 2017). The central goal of the pre-survey is to identify a product within the hiking apparel category that is perceived as less complex, and credible to customers as being both green and the outcome of a co-creation process, which could be used later as a stimulus in the main survey.

Exactly 100 participants have responded to the survey. Most of the participants were female (63%). The average age was 28 years. The survey was distributed on social media with the help of Qualtrics. The language setting of the survey was English.

In the introductory text of the survey, a brief description of the product characteristics of outdoor apparel was given. In the first question of the pre-survey, participants were asked to rank five presented products from the outdoor apparel segment (Hiking T-shirt, Hiking Socks, Hiking Shorts, Hiking Shorts, and Hiking Jacket) according to the perceived complexity. The difficulty of creating a new model of each displayed product was used here to define complexity. In the next question, participants were supposed to rank five products again, according to their belief, creating a new green version of each product is possible.

Table 2: *Pre-survey's measures*

Construct	Items	Measurement
Perceived complexity of new model	Please rank these 5 products according to the perceived product complexity in terms of creating a new model. (1) least complex, (5) most complex	Own construct
Feasibility of green product development	Please rate these 5 products according to whether you think it is possible to develop a green product version with having the same features. (1) very easy, (5) very difficult	Own construct
Credibility of Co-Creation	Please assess to what extent you think the customers have the skills and the necessary knowledge to develop a **new** product of each category together with the company. (1) Very unlikely, (7) Very likely	Own construct
Credibility of Co-Creation in terms of green products	Please indicate the extent to which you believe customers have the skills and capabilities to develop a new green version of each product together with the company. (1) Very unlikely, (7) Very likely	Own construct
Co-Ceation purchase experience	Have you ever bought a product, that was co-created? (1) Yes, (2) No, (3) Not sure	Own construct
Sustainability concerns on purchase intention	Please indicate, how much you agree on the following statement. "My concern for the environment has an impact on my purchasing choices." (1) strongly disagree, (7) strongly agree	Own construct
Demographics	Age, Gender, Residing Country	Own construct

To ensure the reliability of the responses, the randomization option of the five possible answers was implemented. In the further course of the pre-survey, a definition of co-creation was provided to safeguard that participants could respond to the following two questions, which centered on whether participants believe that actively participating customers can develop each of these products in general and each product in a green version. Two questions focused on a previous purchase of a co-created product and the degree how much participants consider sustainable characteristics when making a purchase were included at the end of the pre-survey. Following these two questions, three demographic questions were made.

3.1.2 Pre-survey findings

In order to determine the least complex product, a series of Friedman's ANOVA analyses were performed. Using the mean values, the category Hiking T-shirt was rated as the least complex product ($M_{\text{T-Shirt}}$ = 2.28, SD = 1.53), which was then treated as the comparative product category in the pairwise comparison. The categories are overall significantly different from each other, $X^2(4)$ = 54.53, $p < .001$. The pairwise comparison showed that Hiking T-shirts differ significantly from Hiking Shoes, Hiking Jackets, Hiking Socks, and Hiking Shorts.

Table 3: *Pre-Survey Friedman's ANOVA findings for product complexity*

Ranks		Mean Ranks	N	X^2	df	Sig.
Rank 1	T-Shirt	1.37	100	6.76	1	.009
	Socks	1.63				
Rank 2	T-Shirt	1.31	100	14.44	1	<.001
	Shorts	1.69				
Rank 3	T-Shirt	1.30	100	16.00	1	<.001
	Shoes	1.70				
Rank 4	T-Shirt	1.30	100	16.00	1	<.001
	Jacket	1.70				

To identify the product that is thought to be most likely to be created in a green version, another pairwise comparison was conducted. The Hiking T-shirt was also perceived as a product that can be created in a green version as the easiest ($M_{\text{GreenT-Shirt}}$ = 1.69, SD = 1.53), whereas the Hiking Shoes were considered the most difficult ($M_{\text{GreenShoes}}$ = 4.47, SD = 1.74).

Table 4: *Pre-Survey Friedman's ANOVA findings for Green Product Development*

Ranks		Mean Ranks	N	X^2	df	Sig.
Rank 1	Green T-Shirt	1.32	100	12.96	1	<.001
	Green Socks	1.68				
Rank 2	Green T-Shirt	1.16	100	46.24	1	<.001

	Green Shorts	1.84					
Rank 3	Green T-Shirt	1.10	100	64.00	1		<.001
	Green Shoes	1.90					
Rank 4	Green T-Shirt	1.11	100	60.84	1		<.001
	Green Jacket	1.89					

Again, the H0 can be rejected, $X^2(4) = 195,54$, $p < .001$.

The pre-survey's third purpose was to determine a product, which is sufficiently credible to be the outcome of a co-creation process. Using a paired-sample t-Test, taking Hiking T-Shirt as the comparison product, since it had the highest Mean ($M_{CredibilityT\text{-}Shirt} = 4.08$, $SD = 0.918$). Again, all product categories are significantly different from each other.

Table 5: *Pre-Survey paired samples t test findings for the usability of co-creation*

Paired Samples Test									
Pairs		**Mean diff.**	**Std. deviation**	**95% CI**		**t**	**df**	**Significance**	
				Lower	*Upper*			*One-sided p*	*Two-sided p*
Pair 1	*T-Shirt & Socks*	0.28	0.97	0.09	0.47	2.90	99	.002	.005
Pair 2	*T-Shirt & Shorts*	0.53	0.87	0.36	0.70	6.09	99	<.001	<.001
Pair 3	*T-Shirt & Shoes*	1.55	1.37	1.28	1.82	11.35	99	<.001	<.001
Pair 4	*T-Shirt & Jacket*	1.06	1.30	0.80	1.32	8.14	99	<.001	<.001

We applied a similar approach regarding the perceived credibility of a co-created green product.

Table 6: Pre-Survey paired samples t test findings for the usability of green co-creation

Paired Samples Test									
Pairs		**Mean diff.**	**Std. deviation**	**95% CI**		**t**	**df**	**Significance**	
				Lower	*Upper*			*One-sided p*	*Two-sided p*
Pair 1	*Green T-Shirt & Green Socks*	0.24	0.09	0.06	0.41	2.70	99	.004	.008
Pair 2	*Green T-Shirt & Green Shorts*	0.45	0.95	0.26	0.63	4.75	99	<.001	<.001
Pair 3	*Green T-Shirt & Green Shoes*	1.37	1.30	1.11	1.62	10.53	99	<.001	<.001
Pair 4	*Green T-Shirt & Green Jacket*	1.07	1.10	0.85	1.29	9.70	99	<.001	<.001

In summary, Hiking T-shirts have emerged as the most suitable product category for the main survey.

3.2 Main survey's data collection

Appinio was selected as the method to gather the data to obtain a sample size that would be representative of the three studies. Appinio is a research firm that was established in

Hamburg in 2014 and gives other businesses access to customer insights on a variety of issues within a short period. Appinio's method involves sending surveys to individuals who have downloaded the App, to participate in several surveys. Consumers that use their app to participate in surveys are naturally driven to do so, which produces high-quality data because the consumers are not financially motivated.

3.3 Study 1

Study 1 followed a 2 (greenness: green versus non-green) x 2 (source of innovation: co-created versus non-co-created) design in a survey setting. A total of 1001 participants took part in the study, from which 49.95% indicated to be female. 24.4% of the sample, thus the biggest group, indicated to be between 45 and 54 years old.

3.3.1 Stimuli Development

To compare the four groups (green co-created; non-green co-created; green non-co-created; non-green non-co-created), four scenarios have been developed. The development of the respective stimuli combined existing literature about co-creation with research in the field of product attributes in the apparel context. As formulated already in the pre-survey, a great extent of attention has been devoted to the goal, of presenting the product in a manner, that is credible for participants to be an outcome of a co-creation process (green co-created; non-green co-created). Following the experimental setup by Nishikawa et al. (2017), both co-creation stimuli were supplemented with *"Co-created with customers"* to indicate the source of innovation. To strengthen this association, *"jointly created with our customers (people like you)" have* been added to the standard product description. According to a prior study, the type of fabric, the availability of eco-labels, and the traceability of the materials used are the product qualities that buyers value most when buying sustainable outdoor clothing. (Wang et al., 2022). These attributes have been used for the green stimuli (green co-created; green non-co-created). General product attributes have been selected based on research in the material science of outdoor apparel; see Appendix for detailed scenarios.

3.3.2 Method

1001 participants have been randomly assigned to one of the four scenarios. T-shirts were employed as stimuli for all participants based on the pre-survey results, which are also well-accepted in the literature (Dahl et al., 2015). All participants were shown a product announcement regarding a Hiking T-shirt, with the respective manipulation. After reading the product announcements, participants were asked to complete two manipulation checks. First,

they had to indicate how much they consider this product to be green ("In your opinion, to what extent does this product have sustainable features?"; 1 = not at all to 7 = totally). Next, participants were asked to select the source of the innovation (Designers only; Customers only; Co-Creation). In the course of the survey, were asked how often they purchase a T-Shirt (from "less than once every two weeks" to "more than once each month"). In addition, they were asked five questions regarding individuals perceived green trust (1= strongly disagree to 7 = strongly agree, e.g., "I think that the product's environmental performance meets the expectations."), three questions regarding the perceived functional trust (1= strongly disagree to 7 = strongly agree, e.g., "I feel like this product is likely to perform well."), and three questions concerning purchase intention (1 = very low to 7 = very high "My willingness to buy this product is.") all related to the previously shown product announcement. Finally, participants gave answers to consumers' green values (1= strongly disagree to 7 = strongly agree, e.g., "I would describe myself as environmentally responsible."), the familiarity with co-creation (No & Yes, "Are you familiar with co-creation?") and a series of demographics.

Table 7: *Number of study 1's participants per scenario*

Scenario	Frequency (N)
Green co-creation	248
Green non-co-creation	265
Non-green co-creation	244
Non-green non-co-creation	244
Total	1001

3.3.3 Measurement

All survey questions, except the source of innovation, the product involvement, the familiarity with co-creation, and the demographics were measured on a 7-point Likert scale.

Table 8: *Measures of Study 1*

Segmentation variable	Item	Measurement & Source
Perceived "Greenness" (Manipulation check	In your opinion, to what extent does this product have sustainable features?	Own Construct; Not at all (1), Totally (7)
Source of Innovation	After reading this product introduction, please indicate the source of innovation. The product was made by: - Professionals of the firm - Customers - Customers and professionals	Own Construct

Product involvement	How often do you purchase a T-Shirt?	- More than once each month - Once a month - Once every other month - Less than once every 2 months (Kinley et al., 2010)
Green Trust	Please indicate your level of agreement with the following statements. 1) (…) this product's environmental image is generally reliable. 2) (…) this product's environmental functionality is generally dependable. 3) (…) this product's environmental claims are trustworthy. 4) (…) the product's environmental performance meets the expectations. 5) (…) this product keeps promises for environmental improvements.	Five 7-point likert scale items; Strongly disagree (1), Strongly agree (7) (Chen, 2010)
Functional Trust	Please indicate your level of agreement with the following statements. 1) I feel like this product is likely to perform well. 2) I feel that this product seems capable of doing its job. 3) This product seems to be functional.	Three 7-point likert scale items; Strongly disagree (1), Strongly agree (7) (adapted from Homburg et al., 2015)
Purchase Intention	Please rate the degree to which you agree or disagree with each of the following statements. 1) The likelihood of purchasing the product is 2) The probability that I would try this product is 3) My willingness to buy this product is	Three 7-point likert scale items; (1) Very low to (7) Very high (Mohr & Webb, 2005)
Familiarity with Co-Creation	Are you familiar with Co-Creation?	- Yes - No (Adapted from Schreier et al., 2012)
Green Values	Please rate the degree to which you agree or disagree with each of the following statements. 1) It is important to me that the products I use do not harm the environment. 2) I consider the potential environmental impact of my actions when making many of my decisions. 3) My purchase habits are affected by my concern for our environment.	Six 7-point likert scale items; Strongly disagree (1), Strongly agree (7) (Haws et al., 2014)

	4) I am concerned about wasting the resources of our planet. 5) I would describe myself as environmentally responsible. 6) I am willing to be inconvenienced in order to take actions that are more environmentally friendly.	
Demographics	Age, Gender, Monthly Income, Highest Education, Country of Residence	Own Construct

3.3.4 Reliability analysis

A series of reliability analyses used Cronbach's alpha to assess the reliability of the constructs used. The results of the analysis showed that all constructs had an alpha value greater than the critical value of 0.7. However, values above 0.9 indicate a high internal item correlation (Table 9). Based on the reliability analysis findings, each construct's means were calculated.

Table 9: *Study 1's Cronbach's alpha values*

Construct	*Initial number of items*	*Cronbach's Alpha*	*Items deleted*	*Final number of Items*
Green Trust (GT)	5	0.915	-	5
Functional Trust (FT)	3	0.840	-	3
Purchase Intentions (PI)	3	0.921	-	3
Green Values (GV)	6	0.915	-	6

3.3.5 Manipulation Check

One-Way ANOVA was performed to test mean differences, in other words, whether the scenarios were well comprehended by the participants, First, findings indicated a statistically significant mean difference regarding the source of innovation ($M_{\text{Co-Creation}}$= 2.52; $M_{\text{Professional}}$ = 2.27; p< .001). Second, the mean differences regarding the perceived greenness were also statistically significant (M_{Green}= 5.69; $M_{\text{Non-Green}}$= 5.42; p< .001). Therefore, it can be concluded, that scenarios were correctly understood by participants.

Table 10: *Study 1's manipulation check*

Scenario Block (I)	*Perception*	*M*	*Mean difference*	*Sig.*	*95% CI*	
					Lower	*Upper*
	Non CC	2.27	0.25	<.001*	2.19	2.35

Source of Innovation	Co-creation	2.52				2.45	2.59
Greenness	Non-Green	5.42	0.27		<.001*	5.32	5.52
	Green	5.69				5.59	5.79
Note	*p <.05						

3.3.6 Results

Hypothesis 1

Hypothesis 1 tried to understand the mediation effect of a) green trust and b) functional trust on purchase intention. More formal:

H1: The positive influence of the new green product green claim on consumers' purchase intention is positively mediated by consumers' perceived a) green trust and b) functional trust about the new product.

Hayes' PROCESS model 4 application in SPSS was applied, to investigate the mediation effect of green trust (M_1) and functional trust (M_2) on the dependent variable purchase intention (Y) concerning the greenness of the product (Green versus Non-Green) as the independent variable (X), regardless of the source of innovation (design mode). Findings indicated that the green claim positively impacted green trust ($\beta_{Greenness \rightarrow GreenTrust}$= 0.209; p= .004). The findings revealed a statistically significant relationship between the greenness of the product and green trust (M_1). However, the relationship between the greenness scenario and functional trust (M_2) was found to be non-significant ($\beta_{Greenness \rightarrow FunctionalTrust}$ = 0.000; p = .997). The direct effect between the Greenness Scenario and the outcome variable (purchase intention) was significant ($\beta_{Greenness \rightarrow PurchaseIntention}$ = -0.201; p = .008). Based on the way, the independent variable was coded, findings showed, that participants preferred non-green products over green products. Further, the relationship between the two mediators and the outcome variable was investigated. Green trust (M_1) as a variable was found to have a statistically significant influence on the dependent variable purchase intention ($\beta_{GreenTrust \rightarrow PurchaseIntention}$ = 0.512; p = .000). According to the full model (Figure 2), functional trust (M_2) also positively impacted purchase intention ($\beta_{FunctionalTrust \rightarrow PurchaseIntention}$ = 0.372) Again, this relationship was found to be statistically significant, p = .000. Shedding light on the mediation effect of green trust (M_1) and functional trust (M_2), bootstrap values were taken into consideration. Based on these values, results revealed a mediation effect of green trust, 95% CI [0.035; 0.189]. However, any sign of a mediation effect regarding Functional Trust was not found, 95% CI, [-0.050, 0.052].

Table 11: *Mediation effect of green trust and functional trust on purchase intention*

Outcome		Indirect Effect Paths	Coefficient	Lower CI	Upper CI	Findings
	1	Green → Green Trust	0.209	0.068	0.350	Significant
	2	Green → Functional Trust	-0.0003	-0.136	0.135	Non-significant
	3	Green Trust → Purchase Intention	0.512	0.048	0.617	Significant
	4	Functional Trust → Purchase Intention	0.372	0.263	0.482	Significant
	5	Green → Green Trust → Purchase Intention	0.107	0.035	0.189	Mediation
	6	Green → Functional Trust → Purchase Intention	-0.0001	-0.050	0.052	No Mediation
		Direct Effect Path	**Direct Effect**	**Lower CI**	**Upper CI**	
	7	Green → Purchase Intention	-0.201	-0.350	-0.053	Significant
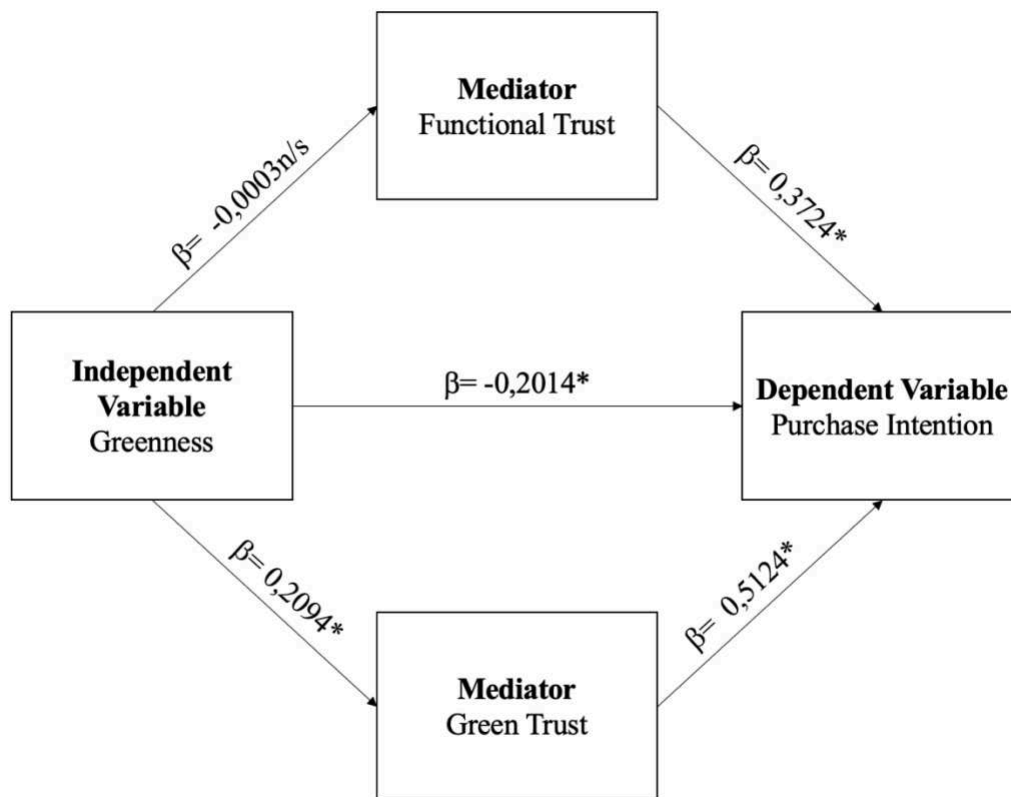
Figure 2: *Results of the full mediation model with purchase intention*

Green trust was found to mediate the relationship between green products and purchase intention. However, no evidence was found, that functional trust has a mediating effect on purchase intention. Concerning the stated hypotheses, H1 can be partially accepted, saying, that only green trust and not functional trust mediate the relationship of green products on purchase intention.

Hypothesis 2

It was hypothesized that customers show more green trust and functional trust in co-created new green products than in new green products developed internally by professionals. More precisely:

H2: Observing consumers display higher a) green trust and b) functional trust in co-created new green products than in new green products developed by professionals.

To test H2 a two-way ANOVA (univariate) with greenness and the design mode as the two fixed factors and green trust as well as functional trust sequentially as the dependent variables, was performed.

Findings revealed that the greenness of a product ($F = 8.67$; $df = 1$) was significant, $p = .003$ on the dependent variable green trust. whereas the design mode ($F = .87$; $df = 1$) did not influence green trust. Looking at the interaction effect ($F = .93$; $df = 1$) the model showed a non-significant ($p = .335$) relationship. In other words, only the degree of a product's greenness ($M_{Green} = 5.19$; $M_{Non-Green} = 4.98$) was statistically significantly different in terms of green trust. The design mode ($M_{Co-Creation} = 5.12$; $M_{Professional} = 5.06$) did not influence consumers' green trust in the product.

Table 12: *Univariate results for Design mode and product's greenness on green trust*

Test between-subject effect					
Dependent variable: Green trust					
Source	**Typ III sum of square**	**df**	**M square**	**F**	**Sig.**
Corrected model	13.34ᵃ	3	4.45	3.45	0.016*
Intercept	25893.99	1	25893.99	20058.36	0.000*
Greenness	11.20	1	11.20	8.67	0.003*
Design Mode	1.12	1	1.12	0.87	0.353
Interaction effect	1.20	1	1.20	0.93	0.335
Note: *$p>.05$, a. R Squared = .010 (Adjusted R Squared = .007)					

Further, the effect of the product's greenness and the design mode as the two fixed factors on functional trust, treated as the dependent variable was tested. In this case, the greenness of a product ($F = .001$; $df = 1$) was found to be non-significant concerning functional trust, $p = .971$. Strictly speaking, a green product ($M_{Green} = 5.33$) compared to a non-green product ($M_{Non-Green} = 5.33$) was assessed by the participants as almost equal in terms of the functional trust ($M_{Difference} = 0.03$; $p = .971$).

Table 13: *Univariate results for Design mode and product's greenness on functional trust*

	Test between-subject effect				
Dependent variable: Functional trust					
Source	**Typ III sum of square**	**df**	**M square**	**F**	**Sig.**
Corrected model	6.14[a]	3	2.05	1.725	.160
Intercept	28372.85	1	28372.95	23924.90	.000*
Greenness	0.002	1	0.002	.001	.971
Design Mode	0.03	1	0.03	.021	.886
Interaction effect	6.09	2	6.09	5.14	.024*
*Note: *p>.05, a. R Squared = .005 (Adjusted R Squared = .002)*					

Additionally, although within the design mode, a co-created product was perceived as more functional ($M_{\text{Co-Creation}}$= 5.33) compared to a product designed by professionals ($M_{\text{Professional}}$= 5.32), the difference ($M_{\text{Difference}}$= 0.01) concerning functional trust did not reach a significant level (F= .021; df= 1; p= .886). Interestingly, the interaction effect between the two fixed factors product greenness and design mode was significant (F= 5.135; df = 1; p= .024). Findings indicated that the interaction between the design mode and the greenness of a product influences the perceived functionality of green products.

To better understand where the difference lies, independent sample t Tests were performed. A partially significant difference between the green co-creation ($M_{\text{Green-Co-Creation}}$= 5.41) and green professional scenario ($M_{\text{Green-Professional}}$= 5.25) was found, p= .091. These findings indicate that co-creation is preferred in green products. No significant differences were found between the non-green Co-Creation ($M_{\text{Non-Green-Co-Creation}}$= 5.25) and green co-creation ($M_{\text{Green-Co-Creation}}$ = 5.41), p = .096. Lastly, the independent sample t Test between the non-green co-creation ($M_{\text{Non-Green-Co-Creation}}$= 5.25) and the non-green professional scenario ($M_{\text{Non-Green-Professional}}$= 5.40) revealed a non-significant difference, p = .130.
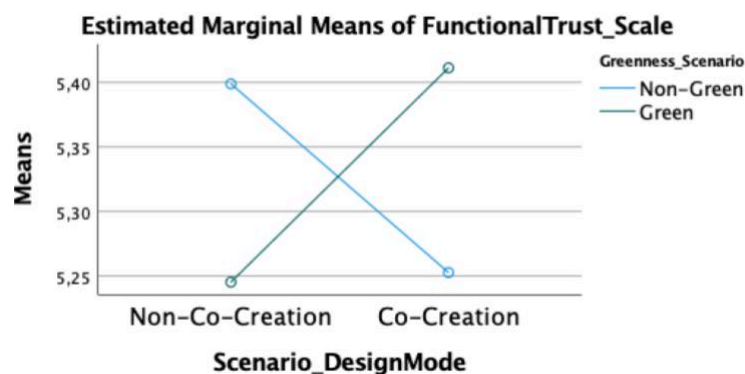

Figure 3: *Mean comparison of univariate analysis*

Table 14: *Results of independent sample t test*

INDEPENDENT SAMPLE T-TEST			
	p	*t*	df
Green co-creation and green professional	0.091	1.69	511
Green co-creation and non-green professional	0.895	0.13	490
Non-green co-creation and green co-creation	0.096	1.67	490
Non-green co-creation and non-green professional	0.130	1.50	486

Taking these findings into consideration, H2 can be partially accepted, saying that the co-creation of green products has no significant impact on green trust, but partially on functional trust.

3.4 Study 2

Study 1 provided evidence that the relationship between green products and purchase intention is positively mediated by green trust. Although no sign was found, that co-creation has a significant impact on green trust, findings indicated a significant influence on functional trust. As such this paper will proceed with the analysis to understand whether the stage in which consumers are involved has an impact on observing consumers' behavioral attitudes. The importance of considering the different sorts of contributions actively engaging consumers might make at various stages of the co-creation innovation process was widely noted in earlier studies. The effect of different co-creation phases on functional trust and green trust in the context of green goods, however, has not been examined in any prior research. Study 2 focuses on examining the effects of co-creation phases on green trust, specifically:

H3: Observing consumers show a higher green trust and functional trust in green products a) co-created in the launch stage compared to the product development stage and b) co-created in the launch stage compared to the ideation stage and c) co-created in the launch stage compared to products created by professionals.

3.4.1 Stimuli Development

The stimuli development for Study 2 followed a similar procedure, already outlined in the stimuli presentation of Study 1. Once again, great attention has been paid to the development of credible and authentic product announcements. In addition to noting that the company is presenting a new Hiking T-shirt and that sustainability plays a central role, the activities of the actively participating customers were explained depending on the scenario. Scenario 4, on the

other hand, was defined as a professional scenario in which the product announcement was limited to the product features.

3.4.2 Method

For study 2, 1005 participants have been randomly selected for one of the four scenarios (ideation stage, product development stage, launch stage, and professional scenario). About 26% indicated to be between 45 and 54 years old, of whom slightly more than 50% identified themselves as female. After reading one of the four treatments, participants had to complete two manipulation checks. First, and like the manipulation check of Study 1, participants were asked, how much they perceive this product to be green ("In your opinion, to what extent does this product have sustainable features?"; 1 = not at all to 7 = totally). In the following, participants had to select the source of innovation, to confirm that the manipulation treatments were understood correctly. Study 2 used the same question constructs already used in the previous study. Each question construct referred to the respective product description, which each participant was able to see at the start of the questionnaire. In the end, participants were asked to fill out a series of demographics.

Table 15: *Number of study 2's participants per scenario*

Scenario	*Frequency (N)*
Green co-creation	251
Green non-co-creation	243
Non-green co-creation	264
Non-green non-co-creation	247
Total	1005

3.4.3 Measurements

A comparable survey question structure was used. Since the survey was created to examine the impact of being more specific in the co-creation claim and the participants' corresponding responses, only the measure for the source of innovation, also known as the manipulation check, has been updated with a new, more accurate question. The whole of study 2 can be found in the Appendix 5.

Table 16: *Measures of Study 2*

SEGMENTATION VARIABLE	*ITEM*	*MEASUREMENT & SOURCE*
Perceived "Greenness" (Manipulation check	In your opinion, to what extent does this product have sustainable features?	Own Construct; Not at all (1), Totally (7)
Source of Innovation	According to what you have read previously: Please indicate in which	Own Construct

	stage the customers have been part of the innovation process - Ideation stage - Product development stage - Launch stage - Non-co-created	

3.4.4 Reliability analysis

In study 2, the same question constructs to measure green trust ($\alpha = 0.907$), functional trust ($\alpha = 0.833$), purchase intention ($\alpha = 0.922$), and green values ($\alpha = 0.911$) from the literature were used. Since all constructs achieved the critical value of 0.7 means for each scale were calculated.

Table 17: *Study 2's Cronbach's alpha values*

Construct	Initial number of items	Cronbach's Alpha	Items deleted	Final number of Items
Green Trust (GT)	5	0.907	-	5
Functional Trust (FT)	3	0.833	-	3
Purchase Intentions (PI)	3	0.922	-	3
Green Values (GV)	6	0.911	-	6

3.4.5 Manipulation check

The perceived greenness item was assessed; however, in contrast to Study 1, this item will not be regarded as a manipulation check because all treatments were intended to be green product announcements. Again, the aim of Study 2 was to investigate a potential difference regarding the communication of co-creation innovation stages on participants' perceived green trust and functional trust. To validate the effectiveness of the manipulation check, a One-Way ANOVA was performed to test the mean differences between the four groups (ideation, product development, launch, and professionally made). In order to do so, customers' perceived source of the product as the dependent variable and the design mode (1 to 4) as the grouping variable was used. The outcome of the ANOVA testing revealed a significant difference between the groups, respectively the scenarios, $p = .000$. Post hoc tests revealed that only the differences between the co-creation launch stage and the co-creation product development stage were nonsignificant, $p = .127$.

Table 18: *Study 2's manipulation check*

Scenario Block (I)	Scenario Block (J)	*M* difference	Sig.	95% CI	
				Lower	Upper
Launch	Idea Generation	0.42	<0.001*	0.26	0.59
	Product development	0.14	.127	-0.25	0.31
	Professionals	-0.91	<0.001*	-1.08	-0.74
Note	*p < .05*				

3.4.6 Results

Study 2 sought to determine whether knowing the stage at which actively participating consumers had contributed to the co-creation process affected the degree to which participants display green trust and functional trust in green products. ANOVA univariate analysis was performed to test this hypothesis.

The design mode (co-creation versus created by professionals), which included the ideation stage, product development stage, launch stage, and professional scenario, was utilized as the fixed factor, with green trust as the initial dependent variable and functional trust as the secondary one. Since there were four groups represented by the categorical independent variable, post-hoc were used to determine where mean differences in the dependent variable would be seen.

First, an investigation on which of the four Design Mode scenarios led to the highest mean of green trust was made. Across the four Design Mode scenarios, findings indicated that two out of three co-creation scenarios, namely the product development stage ($M_{ProductDevelopment}$ = 5.18) and the launch stage (M_{Launch} = 5.28) had on average higher means compared to the professional scenario ($M_{Professional}$ = 5.15). Only the ideation stage ($M_{Ideation}$ = 5.11) resulted in slightly lower means compared to the professional scenario. The relationship between the involvement stage factor (F = 1.078, df = 3) on green trust was not significant, p = .358.

Analyzing functional trust, a Univariate analysis was performed, using the involvement stage of consumers as the fixed factor with functional trust as the dependent variable. Descriptive statistics revealed a similar pattern seen in green trust as the dependent variable. Launch Stage (M_{Launch} = 5.51) yielded higher means compared to a) the product development stage ($M_{ProductDevelopment}$ = 5.39) b) the ideation stage ($M_{Ideation}$ = 5.31) and c) the professional scenario ($M_{Professional}$ = 5.28). In terms of functional trust, the three co-creation scenarios were perceived as superior compared to the professional scenario. For functional trust, the scenario

factor ($F = 2.277$, $df = 3$) was marginally significant, $p = .078$. Tukey's post-hoc test revealed a higher mean for the launch stage compared to a) the product development stage ($M_{Difference} = 0.12$; $p = .602$), b) the Ideation stage ($M_{Difference} = 0.19$; $p = .164$), and c) professional scenario ($M_{Difference} = 0.23$; $p = .081$). Findings revealed, that if a product is co-created in the launch stage it is assessed of higher functionality compared to a product created solely by professionals. These findings are in line with the predictions made earlier in the paper.

With respect to functional trust, results show that all three co-creation scenarios produced higher means than the professional scenario. Findings indicated that only a product that is co-created in the launch stage outperforms a product that is created by professionals in terms of functional trust.

Results show that there are no significant differences regarding the involvement stage of consumers on green trust. Hypothesis 3 can be partially accepted since the launch stage was found to be statistically significantly different from the professional scenario.

CHAPTER 4: DISCUSSION AND CONCLUSION

The two presented studies try to shed light on the relationship between green products and purchase intention. The results of hypothesis 1 demonstrate, that green trust mediates the relationship between green products and purchase intention favorably. In line with previous findings, highlighting the importance of green trust regarding purchase intention (Leonidou et al., 2013) the findings of this paper show that green trust is an important factor in customers' purchase decisions. Contrary to previous research, which emphasizes the importance of functionality trust in green products (Luchs et al., 2010), the findings do not indicate a mediation role of functional trust between green products and purchase intention. Functional trust, which is defined as the extent customers expect that green products also fulfill a utilitarian purpose, seems to be less important in the purchase decision compared to green trust.

With hypothesis 2 this paper tries to investigate the effect of co-creation on functional trust and green trust. Based on traits like openness, transparency, and dialogue which co-creation inherently possesses (Prahalad & Ramaswamy, 2004a), this paper hypothesizes that co-creation can help increase consumers' functional and green trust. Interestingly and against the expectations, results indicate that co-creation plays a more important influence on product functionality than on trust in green claims.

Study 2 suggests that a product that is co-created at the launch stage is one that is perceived by consumers to be more functional. This is in line with what was suggested. The paper hypothesizes that the contributions actively participating customers make during the launch stage, are the most tangible and comprehensible for observing customers, which strengthens observing customers' perception regarding the functionality of green products. However, no significant differences between the other two co-creation stages were found concerning green and functional trust. This is rather surprising, since it was suggested, that due to a high level of transparency, observing consumers will also display a higher degree of green trust.

In conclusion, the findings indicate a tendency, that co-creation might function as a promising approach to increase consumers' perception regarding the functionality of green products. The usefulness and efficacy of green goods are frequently equated with lower levels, as covered in the earlier chapters. However, our findings indicate, that co-creation as an Innovation measurement might help to attenuate this negative connotation. Companies that

endeavor to push their products in a greener direction can use co-creation to help them market the new green products as more reliable in terms of functionality.

CHAPTER 5: LIMITATIONS AND FURTHER RESEARCH

5.1 Academic Implications

Despite receiving a lot of attention, the literature does not explicitly examine the co-creation paradigm regarding the contribution of customers at different stages of the innovation process (Bogers et al., 2010). This dissertation combines two perspectives on co-creation in the green product segment. While previous literature has highlighted the effect of communicating a company's co-creation practices (Costa & Coelho do Vale, 2018), and other streams of literature on the importance of considering different co-creation stages (Carbonell et al., 2009), this paper aimed to investigate if the innovation co-creation stage matters in terms of green purchase intention. This thesis contributes to the existing literature in various ways.

First, this thesis advances the literature of co-creation by showing that for the development of new green products the involvement of consumers in the launch stages is the stage that companies should consider within the co-creation process. Prior research looked at new product development stages from an internal perspective (Chang & Taylor, 2016; Weber & Heidenreich, 2018), and indicate that customer involvement in the later stages has a favorable impact on important market and product performance metrics. This study supports the effectiveness of inviting customers in the launch stage (Chang, 2019) while adding a new perspective on purchase intentions in the field of co-created green products.

Secondly, this thesis shows, that co-creation can help to increase observing customers' perception regarding the functionality of green products. Since previous literature highlights, that customers perceive green product attributes as a liability, having an unfavorable trade-off effect on non-green product attributes (Luchs et al., 2010), this thesis provides evidence, that co-creation can help to overcome the negative implications related to green attributes.

Thirdly, the pre-study and both main studies highlight that T-shirts are suitable for investigating the co-creation field. At the same time, this paper has tapped into new areas by testing T-shirts in the sustainability field about co-creation. The perceived greenness of the product indicates that further research into green co-creation can use T-shirts as a stimulus.

Finally, our findings support that especially green trust plays a key role when examining consumers' purchase intention of new green products. Green trust can help to overcome the

green gap, which constitutes a major barrier for companies successfully introduce green products.

5.2 Managerial Implications

To take advantage of the positive effect of co-creation on functional trust, brand and innovation managers should complement the current innovation measures with co-creation. Co-creation characteristics like openness and transparency can constitute a promising strategy for enhancing functional trust in green products. Co-creation may be able to alleviate customers' inclinations that green products are ineffective when compared to their conventional counterparts in this way. Transparent and open communication in general, as we showed throughout our green stimuli, may be used to promote green trust in green products, which, once again, mediates the relationship between green products and purchase intention.

Previous co-creation stage-related findings suggest that customer contribution throughout various stages affects relevant outcome variables of companies (Chang & Taylor, 2016). The findings suggest that new product managers are well advised to communicate that the green product was co-created during the launch stage to effectively launch green products on the market. Based on these findings, brands might invite actively participating consumers as brand ambassadors in the product launch process. Customers might also be urged to suggest and advertise the product in the market and share their experiences. Companies then may boost the likelihood that the green product will satisfy consumer wants and expectations and be successful in the market by actively incorporating customers in the product launch.

5.3 Limitations and Further Research

It is important to note, that this dissertation's results need to be seen with some limitations. First, a major concern regarding the validity of the data is based on the effectiveness of the manipulation check question used in both studies. Since a great number of participants failed the manipulation check, especially regarding the source of innovation in Study 1, the significance of the obtained results needs to be seen with some restrictions. A major focus during the development period of the stimuli lay on keeping the scenarios as credible and credible as possible. Therefore, it was refrained from adding "designed by our designer" in the professional scenarios due to the belief, that customers would associate the source of innovation automatically to designers when no explicit note was given. Further research in this field should keep this in mind, when developing scenarios, aiming to compare co-creation with a professionally created scenario. It is predicted that a trade-off between authenticity and

unambiguity of the product announcement would have raised the chance of gathering more reliable data. Furthermore, further research should conduct focus groups to test the appropriateness of the stimuli.

As the sample focused on consumers from Germany, it would be interesting to see how the results might differ in relation to other countries. At the same time, further research could include age as a moderating variable. In particular, the comparison between different generations could shed further light on the impact of the co-creation of green products. This study used a Hiking T-Shirt as a stimulus. Despite the fact, that low-complex products, such as a T-Shirt (Schreier et al., 2012), tend to be well-suited and accepted for investigating the field of co-creation, the findings need to be interpreted in the context of this product. It would be interesting to see, if the data differ first, with other products, apart from the hiking context. Since co-creation was observed in a very specific product context (Hiking), it is suggested, that boundary conditions, like familiarity with the product (Poetz & Schreier, 2012), could provide a more detailed and differentiated picture of observing customers' perception of co-creation. Observing the mediation or moderating role of familiarity with the specific product can constitute another initial point for future research. Additionally, a differentiated view on co-creation has room for additional study. The literature does not consider the effects of the innovation phases of the co-creation process, as described in Chapter 2. To give a more comprehensive understanding of co-creation, it is worthwhile to both look at the stages used in this dissertation's context and further stages of the Co-Creation innovation process, like business case development or concept definition. As the types of contributions differ considerably in the different phases and this area seems rather unexplored, this topic could be an interesting way to add to the existing literature.

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APPENDICES

Appendix 1: *Pre-Survey*

Introduction Dear participant, this research is being conducted in order to fulfill the requirements for the Master's degree at Católica Lisbon School of Business and Economics. By starting the survey, you accept that your participation is completely voluntary. Please note that the identity of the participants will remain anonymous, and that the data collected will be kept confidential and used only in the academic context of this research. If you are willing to participate in this survey, please click on the "-->" button. The survey will take about 5 minutes. In case you have any further questions, please feel free to contact me: s-fbrune@ucp.pt. Thank you very much in advance!

Fabian Brüne

Introduction In the following, you will see 5 products that are used in the context of hiking. These products are designed to meet the specific needs of hikers. Hiking products are usually made of durable, breathable and seam-sealed materials.

Please rank these 5 products according to the perceived product complexity in terms of creating a new model (1= least complex product, 5= most complex product).

_____ Hiking T-Shirt
_____ Hiking Socks
_____ Hiking Shorts
_____ Hiking Shoes
_____ Hiking Jacket

Please rate these 5 products according to whether you think it is possible to develop a (durable, breathable and seam-sealed materials) (1= very easy, 5= very difficult). Green products are characterized by being better for the environment and made from sustainable product components.

_____ Hiking T-Shirt
_____ Hiking Socks
_____ Hiking Shorts
_____ Hiking Shoes
_____ Hiking Jacket

Please read the following introduction carefully: Co-creation can be defined as an innovation practice, where companies use customers' knowledge, competencies, and other types of contributions throughout the whole innovation process (e.g., ideation, concept development, launch) to generate new marketable products together with their customers.

Please assess to what extent you think the customers have the skills and the necessary knowledge to develop a product of each category together with the company.

	very unlikely	unlikely	neither unlikely nor likely	likely	very likely
Hiking T-Shirt	o	o	o	o	o
Hiking Socks	o	o	o	o	o
Hiking Shorts	o	o	o	o	o
Hiking Shoes	o	o	o	o	o
Hiking Jacket	o	o	o	o	o

Please indicate the extent to which you believe customers have the skills and capabilities to develop a new green version of each product together with the company.

	very unlikely	unlikely	neither unlikely nor likely	likely	very likely
Hiking T-Shirt	o	o	o	o	o
Hiking Socks	o	o	o	o	o
Hiking Shorts	o	o	o	o	o
Hiking Shoes	o	o	o	o	o
Hiking Jacket	o	o	o	o	o

Have you ever bought a product, that was co-created?

- o Yes
- o No
- o Not sure

Please indicate, how much you agree on the following statement.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
My concern for the environment has an impact on my purchasing choices	o	o	o	o	o	o	o

Please indicate your age.

_____

Please indicate your gender

- o   Male
- o   Female
- o   Non-binary/third gender
- o   Prefer not to say

In which country do you currently reside?

Appendix 2: *Pre Survey Demographics*

Table 19: *Pre-Survey Demographics – Age*

Age		Frequency
	18 - 24	32
	25 - 34	59
	35 - 44	3
	45 - 54	3
	55 - 64	2
	> 65	1
	Total	**100**

Table 20: *Pre-Survey Demographics – Gender*

Gender		Frequency
	Male	37
	Female	63
	Total	**100**

Table 21: *Pre-Survey Demographics - Country of Residence*

Country		Frequency
	Austria	1
	Canada	1
	Czech Republic	6
	France	1
	Germany	79
	Greece	1
	Portugal	8
	The Netherlands	2
	United States	1
	Total	**100**

Appendix 3: *Study 1*

Dear participant, this research is being conducted in order to fulfill the requirements for the Master's degree at Católica Lisbon School of Business and Economics. By starting the survey, you accept that your participation is completely voluntary. Please note that the identity of the participants will remain anonymous, and that the data collected will be kept confidential and used only in the academic context of this research. If you are willing to participate in this survey, please click on the "-->" button. The survey will take about 8 minutes. In case you have any further questions, please feel free to contact me: s-fbrune@ucp.pt. Thank you very much in advance! Fabian Brüne

Please read the following announcement:

In your opinion, to what extent does this product have sustainable features?

	Not at all	Very little	Somewhat not	Undecided	Somewhat	Very much	Totally
This product has sustainable features	o	o	o	o	o	o	o

After reading this product introduction, please indicate the source of innovation. The product was made by:

o Professionals of the firm
o Customers
o Customers and professionals

How often do you purchase a T-Shirt?

o More than once each month
o Once a month
o Once every other month
o Less than once every 2 months

Please indicate your level of agreement with the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I believe that this product's environmental image is generally reliable.	○	○	○	○	○	○	○
I think that this product's environmental functionality is generally dependable.	○	○	○	○	○	○	○
I believe that this product's environmental claims are trustworthy.	○	○	○	○	○	○	○
I think that the product's environmental performance meets the expectations.	○	○	○	○	○	○	○
I think this product keeps promises for environmental improvements.	○	○	○	○	○	○	○

Please indicate your level of agreement with the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I feel like this product is likely to perform well.	o	o	o	o	o	o	o
I feel that this product seems capable of doing its job.	o	o	o	o	o	o	o
This product seems to be functional.	o	o	o	o	o	o	o

Please rate the degree to which you agree or disagree with each of the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think, the Company is regarded as the best benchmark of environmental management.	o	o	o	o	o	o	o
I think, the company is professional about environmental management.	o	o	o	o	o	o	o
I think, the company is successful about environmental management.	o	o	o	o	o	o	o
I think, company is well established about environmental management.	o	o	o	o	o	o	o
The reputation of the company about environmental management is stable.	o	o	o	o	o	o	o
I think, the company is trustworthy about environmental management.	o	o	o	o	o	o	o
I think, the company is dependable about environmental management.	o	o	o	o	o	o	o
I think, the company concerns for customers about environmental management.	o	o	o	o	o	o	o

Please rate the degree to which you agree or disagree with each of the following statements (1= Very low / 7= Very high).

	Very low	Low	Moderately low	Neither low nor high	Moderately high	High	Very high
The likelihood of purchasing the product is	o	o	o	o	o	o	o
The probability that I would try this product is	o	o	o	o	o	o	o
My willingness to buy this product is	o	o	o	o	o	o	o

Are you familiar with Co-Creation?

o　　　No
o　　　Yes

Please indicate your level of agreement with the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
It is important to me that the products I use do not harm the environment	o	o	o	o	o	o	o
I consider the potential environmental impact of my actions when making many of my decisions.	o	o	o	o	o	o	o
My purchase habits are affected by my concern for our environment.	o	o	o	o	o	o	o
I am concerned about wasting the resources of our planet.	o	o	o	o	o	o	o
I would describe myself as environmentally responsible.	o	o	o	o	o	o	o
I am willing to be inconvenienced in order to take actions	o	o	o	o	o	o	o
that are more environmentally friendly.	o	o	o	o	o	o	o

End of Block: Main

Start of Block: Demographics

How old are you?

o   18 - 24

o   25 - 34

o   35 - 44

o   45 - 54

o   55 - 64

o   65 or older

What gender do you identify as?

o   Male

o   Female

o   Non-binary / third gender

o   Prefer not to say

What is your gross monthly income?

o   No Income

o   <500

o   501 - 1000

o   1001 - 1800

o   1801 - 2500

o   2501 - 3500

o   3501 - 4500

o   >4501

o   Prefer not to say

What is the highest degree or level of education you have completed?

- o No certificate
- o Secondary School
- o Middle School
- o Baccalaureate
- o Completed training
- o Bachelor
- o Master
- o PhD
- o Others

Please select your country of current residence.

Table 22: *Study 1's Demographics - Gender*

Gender*Scenario Block						
Gender		Green Co-Creation	Green Non-Co-Creation	Non-Green Non-Co-Creation	Non-Green Non-Co-Creation	**Total**
	Male	109	128	121	126	**484**
	Female	138	131	117	114	**500**
	Non-binary/ third gender	0	2	3	3	**8**
	Prefer not to say	1	4	3	1	**9**
	Total	**248**	**265**	**244**	**244**	**1001**

Table 23: *Study 1's Demographics - Income*

Income*Scenario Block						
Income		Green Co-Creation	Green Non-Co-Creation	Non-Green Non-Co-Creation	Non-Green Non-Co-Creation	**Total**
	No Income	13	12	9	12	**46**

	<500	12	13	13	3	**41**
	501 - 1000	29	28	25	32	**114**
	1001 - 1800	56	49	44	45	**194**
	1801 - 2500	40	54	54	71	**219**
	2501 - 3500	56	52	52	41	**201**
	3501 - 4500	19	21	20	13	**73**
	>4501	13	21	13	14	**61**
	Prefer not to say	10	15	14	13	**52**
	Total	**248**	**265**	**244**	**244**	**1001**

Table 24: *Study 1's Demographics - Occupation*

Occupation*Scenario Block						
Occupation		Green Co-Creation	Green Non-Co-Creation	Non-Green Non-Co-Creation	Non-Green Non-Co-Creation	**Total**
	Unemployed	14	19	13	13	**59**
	Part-time	38	38	41	42	**159**
	Full-time	149	155	142	146	**592**
	Student	17	20	21	22	**80**
	Working student	1	2	5	1	**9**
	Retired	18	17	13	11	**59**
	Others	11	14	9	9	**43**
	Total	**248**	**265**	**244**	**244**	**1001**

Table 25: *Study 1's Demographics - Education*

Education*Scenario Block						
Education		Green Co-Creation	Green Non-Co-Creation	Non-Green Non-Co-Creation	Non-Green Non-Co-Creation	**Total**
	No certificate	5	3	4	2	**14**
	Secondary school	25	35	29	30	**119**
	Middle school	52	55	44	58	**209**
	Baccalaureate	43	28	50	36	**157**
	Completed training	80	88	70	82	**320**
	Bachelor	27	30	28	220	**105**
	Master	14	23	15	13	**65**
	PhD	1	0	1	2	**4**
	Others	1	3	3	1	**8**
	Total	**248**	**265**	**244**	**244**	**1001**

Table 26: *Study 1's Demographics - Age*

Age		Green Co-Creation	Green Non-Co-Creation	Non-Green Non-Co-Creation	Non-Green Non-Co-Creation	Total
	18 - 24	40	32	38	38	**148**
	25 - 34	41	55	56	40	**192**
	35 - 44	58	67	49	59	**233**
	45 - 54	57	63	65	59	**244**
	55 - 64	51	46	35	44	**176**
	> 65	1	2	1	4	**8**
	Total	**248**	**265**	**244**	**244**	**1001**

Table 27: *Reliability Analysis Study 1*

Construct	Statements	Corrected Item-Total Correlation	Cronbach's alpha
Green Trust	(…) this product's environmental image is generally reliable.	0,781	0,915
	(…) this product's environmental functionality is generally dependable.	0,795	
	(…) this product's environmental claims are trustworthy.	0,781	
	(…) the product's environmental performance meets the expectations.	0,774	
	(…) this product keeps promises for environmental improvements.	0,780	
Functional Trust	(…) this product is likely to perform well.	0,731	0,840
	(…) this product seems capable of doing its job.	0,690	
	(…) this product seems to be functional.	0,689	
Purchase Intention	(…) likelihood of purchasing the product is…	0,857	0,921
	(…) probability that I would try this product is…	0,824	
	(…) willingness to buy this product is…	0,836	
Green Values	It is important to me that the products I use do not harm the environment.	0,776	0,915
	I consider the potential environmental impact of my actions when making many of my decisions.	0,784	
	My purchase habits are affected by my concern for our environment.	0,774	
	I am concerned about wasting the resources of our planet.	0,706	
	I would describe myself as environmentally responsible.	0,759	
	I am willing to be inconvenienced in order to take actions that are more environmentally friendly.	0,759	
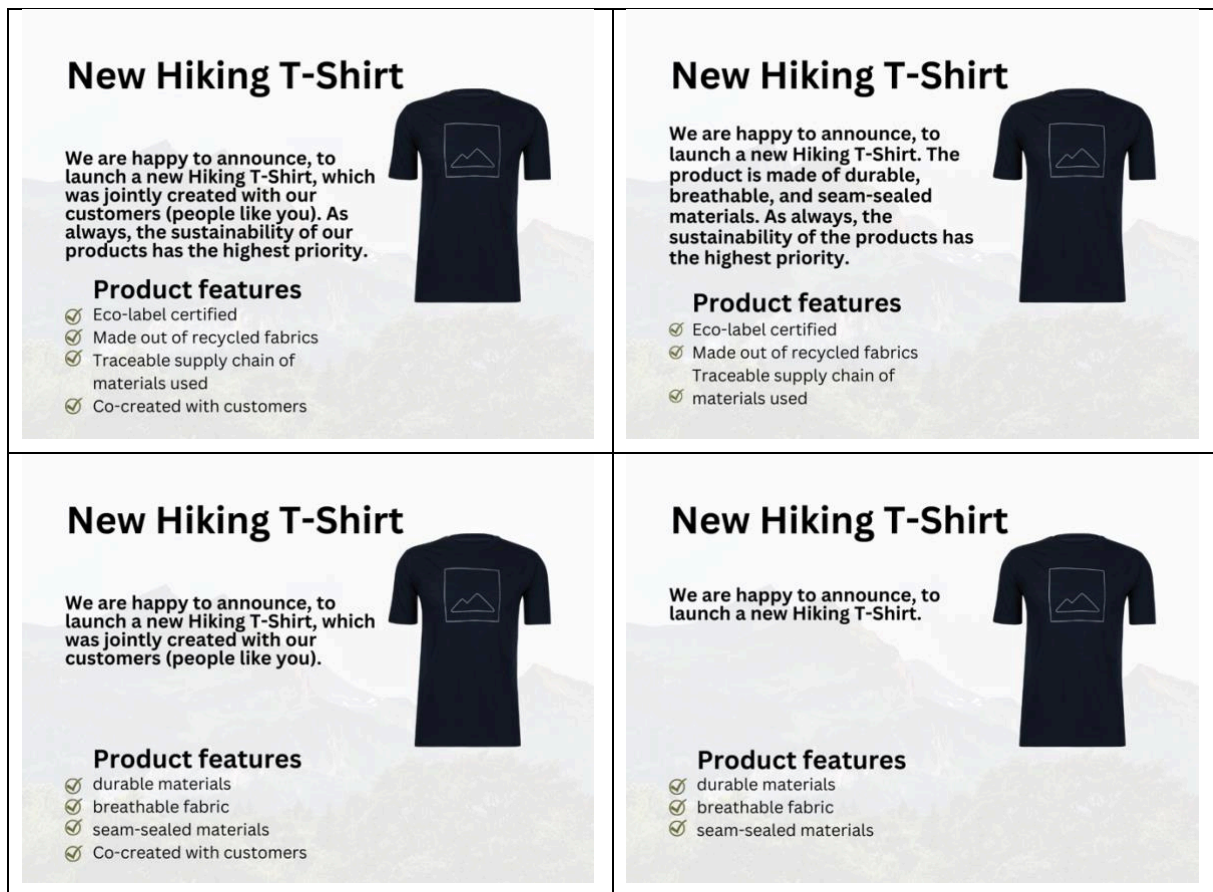
Appendix 4: *Study 1's Stimuli*

Appendix 5: *Study 2*

Dear participant, this research is being conducted in order to fulfill the requirements for the Master's degree at Católica Lisbon School of Business and Economics. By starting the survey, you accept that your participation is completely voluntary. Please note that the identity of the participants will remain anonymous, and that the data collected will be kept confidential and used only in the academic context of this research. If you are willing to participate in this survey, please click on the "-->" button. The survey will take about 8 minutes. In case you have any further questions, please feel free to contact me: s-fbrune@ucp.pt. Thank you very much in advance! Fabian Brüne

Please read the following announcement:

In your opinion, to what extent does this product have sustainable features?

	Not at all	Very little	Somewhat not	Undecided	Somewhat	Very much	Totally
This product has sustainable features	o	o	o	o	o	o	o

According to what you have read previously: Please indicate in which stage the customers have been part of the innovation process

- Ideation stage
- Product development stage
- Launch stage
- Non-co-created

According to what you have read previously: Please indicate in which stage the customers have been part of the innovation process:

o   Ideation stage

o   Product development stage

o   Launch stage

o   Non co-created

How often do you purchase a T-Shirt?

o   More than once each month

o   Once a month

o   Once every other month

o   Less than once every 2 months

End of Block: Manipulation

Start of Block: Main

Please indicate your level of agreement with the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I believe that this product's environmental image is generally reliable.	o	o	o	o	o	o	o
I think that this product's environmental functionality is generally dependable.	o	o	o	o	o	o	o
I believe that this product's environmental claims are trustworthy.	o	o	o	o	o	o	o
I think that the product's environmental performance meets the expectations.	o	o	o	o	o	o	o
I think this product keeps promises for environmental improvements.	o	o	o	o	o	o	o

Please indicate your level of agreement with the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I feel like this product is likely to perform well.	o	o	o	o	o	o	o
I feel that this product seems capable of doing its job.	o	o	o	o	o	o	o
This product seems to be functional.	o	o	o	o	o	o	o

Please rate the degree to which you agree or disagree with each of the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think, the Company is regarded as the best benchmark of environmental management.	o	o	o	o	o	o	o
I think, the company is professional about environmental management.	o	o	o	o	o	o	o
I think, the company is successful about environmental management.	o	o	o	o	o	o	o
I think, company is well established about environmental management.	o	o	o	o	o	o	o
The reputation of the company about environmental management is stable.	o	o	o	o	o	o	o
I think, the company is trustworthy about environmental management.	o	o	o	o	o	o	o
I think, the company is dependable about environmental management.	o	o	o	o	o	o	o
I think, the company concerns for customers about environmental management.	o	o	o	o	o	o	o

Please rate the degree to which you agree or disagree with each of the following statements (1= Very low / 7= Very high).

	Very low	Low	Moderately low	Neither low nor high	Moderately high	High	Very high
The likelihood of purchasing the product is	o	o	o	o	o	o	o
The probability that I would try this product is	o	o	o	o	o	o	o
My willingness to buy this product is	o	o	o	o	o	o	o

Are you familiar with Co-Creation?

o   No
o   Yes

Please indicate your level of agreement with the following statements (1= Strongly disagree / 7= Strongly agree).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
It is important to me that the products I use do not harm the environment	o	o	o	o	o	o	o
I consider the potential environmental impact of my actions when making many of my decisions.	o	o	o	o	o	o	o
My purchase habits are affected by my concern for our environment.	o	o	o	o	o	o	o
I am concerned about wasting the resources of our planet.	o	o	o	o	o	o	o
I would describe myself as environmentally responsible.	o	o	o	o	o	o	o
I am willing to be inconvenienced in order to take actions	o	o	o	o	o	o	o
that are more environmentally friendly.	o	o	o	o	o	o	o

How old are you?

o   18 - 24

o   25 - 34

o   35 - 44

o   45 - 54

o   55 - 64

o   65 or older

What gender do you identify as?

o   Male

o   Female

o   Non-binary / third gender

o   Prefer not to say

What is your gross monthly income?

o   No Income

o   <500

o   501 - 1000

o   1001 - 1800

o   1801 - 2500

o   2501 - 3500

o   3501 - 4500

o   >4501

o   Prefer not to say

What is the highest degree or level of education you have completed?

o   No certificate

o   Secondary School

o   Middle School

o   Baccalaureate

o   Completed training

o   Bachelor

o   Master

o   PhD

                           o   Others

Please select your country of current residence.

_____

End of Block: Demographics

Table 28: *Study 2's Demographics - Age*

Age*Scenario Block						
Age		Idea Generation	Product Development	Launch	Non-Co-Creation	**Total**
	18 - 24	36	34	31	41	**142**
	25 - 34	38	47	45	43	**173**
	35 - 44	66	64	51	50	**231**
	45 - 54	65	53	78	67	**263**
	55 - 64	44	43	56	45	**188**
	> 65	2	2	3	1	**8**
	Total	**251**	**243**	**264**	**247**	**1005**

Table 29: *Study 2's Demographics - Gender*

Gender*Scenario Block						
Gender		Idea Generation	Product Development	Launch	Non-Co-Creation	**Total**
	Male	119	116	131	120	**486**
	Female	131	124	130	120	**505**
	Non-binary/ third gender	1	2	1	4	**8**
	Prefer not to say	0	1	2	3	**6**
	Total	**251**	**243**	**264**	**247**	**1005**

Table 30: *Study 2's Demographics - Income*

Income		Idea Generation	Product Development	Launch	Non-Co-Creation	Total
	Income*Scenario Block					
	No Income	8	7	15	15	**45**
	<500	7	9	4	13	**33**
	501 - 1000	31	28	27	32	**118**
	1001 - 1800	54	47	55	37	**193**
	1801 - 2500	48	58	57	47	**210**
	2501 - 3500	56	46	45	43	**190**
	3501 - 4500	19	13	26	17	**75**
	>4501	24	16	26	24	**90**
	Prefer not to say	4	19	9	19	**51**
	Total	**251**	**243**	**264**	**247**	**1005**

Table 31: *Study 2's Demographics - Occupation*

Occupation		Idea Generation	Product Development	Launch	Non-Co-Creation	Total
	Occupation*Scenario Block					
	Unemployed	8	17	14	24	**63**
	Part-time	139	138	151	142	**570**
	Full-time	54	34	37	37	**162**
	Student	22	26	21	16	**85**
	Working student	4	6	4	1	**15**
	Retired	17	16	22	18	**73**
	Others	7	6	15	9	**37**
	Total	**251**	**243**	**264**	**247**	**1005**

Table 32: *Study 2's Demographics - Occupation*

Education		Idea Generation	Product Development	Launch	Non-Co-Creation	Total
	Education*Scenario Block					
	No certificate	5	3	4	11	**23**
	Secondary school	25	30	21	25	**101**
	Middle school	46	38	43	45	**172**
	Baccalaureate	48	40	34	39	**161**
	Completed training	69	85	102	69	**325**

	Bachelor	22	18	28	24	**92**
	Master	28	21	23	25	**97**
	PhD	6	6	5	d	**25**
	Others	2	2	4	1	**9**
	Total	**251**	**243**	**264**	**247**	**1005**

Table 33: *Reliability analysis Study 2*

Construct	Statements	Corrected Item-Total Correlation	Cronbach's alpha
Green Trust	(…) this product's environmental image is generally reliable.	0,784	0,907
	(…) this product's environmental functionality is generally dependable.	0,785	
	(…) this product's environmental claims are trustworthy.	0,749	
	(…) the product's environmental performance meets the expectations.	0,760	
	(…) this product keeps promises for environmental improvements.	0,750	
Functional Trust	(…) this product is likely to perform well.	0,685	0,833
	(…) this product seems capable of doing its job.	0,715	
	(…) this product seems to be functional.	0,678	
Purchase Intention	(…) likelihood of purchasing the product is…	0,854	0,922
	(…) probability that I would try this product is…	0,821	
	(…) willingness to buy this product is…	0,847	
Green Values	It is important to me that the products I use do not harm the environment.	0,774	0,911
	I consider the potential environmental impact of my actions when making many of my decisions.	0,784	
	My purchase habits are affected by my concern for our environment.	0,778	
	I am concerned about wasting the resources of our planet.	0,679	
	I would describe myself as environmentally responsible.	0,723	
	I am willing to be inconvenienced in order to take actions that are more environmentally friendly.	0,759	

Appendix 6: *Study 2's stimuli*