# To co-create or not to co-create? The case of sustainable utilitarian and hedonic products

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Dissertation is written under the supervision of

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**Abstract**

The impact of our lifestyle on planet Earth is becoming more notorious due to the exponential increase of pollution in the environment. Several organizations (UN, FAO and WWF) pointed to the need to act more consciously. Despite the great willingness of consumers to change, sustainable products still represent a small percentage in the market. Consumers are sceptical about more sustainable products due to lack of trust in the sustainable arguments in products. Co-creation is an innovation strategy that can re-establish consumer trust, due its greater transparency in the new product development process.

In this context, two studies tested whether claiming products as sustainable leads to higher purchasing intentions and whether co-created sustainable products are preferred by consumers over sustainable products fully designed by company's professionals**.** Study one tests an utilitarian product and study two a hedonic product. Our findings show that consumers demand sustainable products over non sustainable. This is explained by consumers' green trust and quality. Interestingly, learning that the sustainable product was co-created showed a negative effect in consumers' purchase intention for utilitarian products while in hedonic consumption co-creation was not significant for purchase intentions. These findings provide new insights for managers and scholars.

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**Keywords:** co-creation; innovation; green products; trust; quality; hedonic products; functional products; purchasing intention.

**Resumo**

O impacto do nosso estilo de vida é cada vez mais visível através do aumento exponencial da poluição no meio ambiente. Várias organizações (UN, FAO e WWF) salientaram que é necessário agir de forma mais consciente. Apesar da grande vontade de mudança por parte dos consumidores, os produtos sustentáveis ainda representam uma pequena percentagem no mercado. Os consumidores estão céticos quanto a produtos mais sustentáveis devido à falta de confiança nos argumentos sustentáveis dos produtos. A cocriação é uma estratégia de inovação que pode restabelecer a confiança dos consumidores, devido à sua maior transparência no processo de desenvolvimento de novos produtos.

Neste contexto, dois estudos testaram se afirmar produtos como sustentáveis leva a maiores intenções de compra e se os produtos sustentáveis cocriados são preferidos pelos consumidores em vez de produtos sustentáveis totalmente concebidos por profissionais de uma empresa. O estudo um testa um produto utilitário e o estudo dois estuda um produto hedónico. Os nossos resultados mostram que os consumidores exigem produtos sustentáveis em vez de produtos não sustentáveis. Isto é explicado pela confiança verde e qualidade dos consumidores. Curiosamente, obtemos que um produto sustentável cocriado mostrou um efeito negativo na intenção de compra de produtos utilitários por parte dos consumidores, enquanto que no consumo hedónico a cocriação não foi significativa para as intenções de compra. Estas descobertas facultam novos conhecimentos para gestores e estudiosos.

**Título:** Co-criar ou não co-criar? O caso de produtos utilitários e hedónicos sustentáveis

**Autor:** Inês do Vale Ferreira

**Palavras-Chave:** co-criação; inovação; produtos verdes; confiança; qualidade; produtos hedónicos; produtos funcionais; intenção de compra.

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## 1. Introduction

*Footprint Calculator*[1]– I believe that we all have typed that on *Google*, to evaluate our daily actions, and realized that we are, indeed, using unnecessary amounts of natural resources and, if everyone acts like us, Earth will disappear in a blink of an eye. Reducing disposable plastics, eating less meat and dairy products, switching to renewable energy, recycling our waste (WWF, 2020) is pointed as the tip of the iceberg to save Earth. Climate change, pollution, environmental degradation, floods, fires, extreme heats have been all over the news, and are a reflect of our consuming patterns and society and business' actions (The New York Times, 2021). Moreover, technological revolution and globalization has led to unsustainable consumption in developing countries, and this affects natural resources (Alzubaidi et al., 2021).

Though, protecting the environment has become a common goal for most western world stakeholders: firms, governments and consumers (Marde & Verite-Masserot, 2018). The need to reduce the impact on Earth has arisen and it can be achieved with more conscious practices (Scott & Weaver, 2018; White, Habib, et al., 2019). Pushed by consumers' consciousness, industries feel encouraged to develop new products to fulfil the needs of environmentally conscious consumers. Such consumers encouraged, a growth on the development of innovative sustainable technologies and processes (Alzubaidi et al., 2021). Promoting sustainable consumption can help to save the problems of overexploitation of natural resources, sustainable consumption contributes to reverse environmental deterioration while pressuring companies to improve their environmental performances (Nguyen et al., 2019).

While some companies are integrating Corporate Social Responsibility and pushing to address consumers' environmental needs (Marde & Verite-Masserot, 2018; Sun et al., 2020), there are, unfortunately, some companies that are just claiming to act sustainably (Szabo & Webster, 2021). Selective disclosure, and not full disclosure, of information about companies' environmental performance is termed as greenwashing (Nguyen et al., 2019). All the fraudulent sustainable claims proclaimed by companies decrease,

[1] https://www.footprintcalculator.org/home/en

brusquely, the trust on sustainable products, arising green scepticism (Jørgensen et al., 2021; Leonidou & Skarmeas, 2017; Olson, 2013).

Green scepticism leads to reduced purchasing intentions of sustainable products (Chen & Chang, 2013), because consumers have no trust in the credence value attributes (Lassoued & Hobbs, 2015) and, there is not a good quality perception (Luchs & Kumar, 2017; Ozbekler & Ozturkoglu, 2020; Skard et al., 2021). This makes it necessary to adopt a different strategy to overcome green scepticism when developing new sustainable products (Wang et al., 2019).

Co-creation is a recognised strategy for breaking down boundaries of lack of trust in products (Costa & Coelho do Vale, 2020; Dahl et al., 2015; Nishikawa et al., 2017; Wang et al., 2019). It is a strategy that creates an interaction between firms and (active) consumers (Costa & Coelho do Vale, 2020), involves exchange of resources such as knowledge and skills for both parties (Sun et al., 2020). As this innovation strategy is more transparent, it can bring many advantages, in the short term, it can increase the perception of innovation capabilities, product quality and trust (Cambra-Fierro et al., 2018; Mingione et al., 2020), outperforming competitors (Rathore et al., 2016). In the long term, it can increase the purchasing intentions, willingness to pay and loyalty of the consumers (Cambra-Fierro et al., 2018; Mingione et al., 2020; Wasaya et al., 2021).

Thus, we argue that co-creation can support sustainability claims in products by bringing higher trust, hence, lower green scepticism (Buerke et al., 2017; Costa & Coelho do Vale, 2020). To better understand this, it is also important to note that co-creation draws on the tacit knowledge from users over the expertise of professionals (Mingione et al., 2020). This means that a co-created sustainable product might be perceived differently depending on the type of consumption (Stock et al., 2015).

The type of consumption can be either more hedonic or more utilitarian (Cheng et al., 2020; Park & Ha, 2016), because utilitarianism and hedonism are not necessarily two ends of one dimension scale (Okada, 2005). Hedonic consumers can be more likely to adopt sustainable co-creation consumption because they can obtain emotional pleasure and satisfaction from being part of an environmental action (Costa & Coelho do Vale, 2018; Park & Ha, 2016). However, utilitarian consumers are less likely to adopt these sustainable co-creation consumption, because when utilitarian products are purchased it

is expected that a certain functional task can be accomplished efficiently (Cheng et al., 2020), and (observing) consumers do not perceive high quality, high functionality on co-created sustainable products (Costa & Coelho do Vale, 2018; Vaquero, 2021).

In all, this dissertation aims to answer the following research question:

- *Can co-creation increase the trust and quality perception in sustainable product and, consequently, increase the purchasing intentions?*

Apart from the main research question, it will also be answered the following ones:

- *Do Quality and Green Trust positively mediate the purchasing intentions of sustainable products?*
- *Do Quality and Green Trust positively mediate the impact of a co-created sustainable product in purchase intentions?*
- *Is the positive effect of co-creation on trust observable across hedonic and utilitarian products?*
- *Do utilitarian products benefit more from perceptions of similarity with the co-creators?*
- *Do we observe a similar behaviour when presenting a hedonic and an utilitarian good?*
-

### *1.1. Conceptual Framework*

In Figure 1 can be observed the Conceptual Framework that will be studied throughout this dissertation.

*Figure 1 - Conceptual Framework.*

## 2. Literature review

### *2.1. Sustainability*

Sustainability is a very common word in our daily life, according to *Google Year in Search 2021* (Google, 2021). Sustainability was searched at record highs worldwide, throughout this year "*how to conserve*", "*is climate change caused by humans*", "*eating less meat less climate change*" and more similar questions were asked to Google (Google, 2021).

In 1987, the United Nations Brundtland Commission defined sustainability as "*meeting the needs of the present without compromising the ability of future generations to meet their own needs*" (United Nation Brundland Comission, 1987). This definition requires, simultaneously, the adoption of economic prosperity, social equity and environmental integrity (Adams et al., 2016; Bansal, 2005; Kimpimäki et al., 2022).

Industries have been identified as part of the environmental problem due to their innovation process and productions, however they can also be the solution (Adams et al., 2016). Companies are taking on Corporate Social Responsibility (CSR) voluntarily, or because protecting the environment has become a common goal to all stakeholders, such as consumers, firms and governments (Marde & Verite-Masserot, 2018; Sun et al., 2020). Adopting CSR is way of showing to stakeholder, that they are committed and concerned with the society (Ashrafi et al., 2018), it can bring loyalty and differentiation to the company (Sun et al., 2020).

Markets research shows that 66% of consumers worldwide are willing to pay more for sustainable products, (Skard et al., 2021; White, Habib, et al., 2019; White, Hardisty, et al., 2019) and claim choosing sustainable brands over brands without sustainable claims (Dangelico et al., 2021). Nonetheless, in practice, when consumers buy goods, usually go for the non-sustainable goods (Costa & Coelho do Vale, 2020; Testa et al., 2021). When there is an intention to behave in an sustainable friendly way but do not engage with this intention, it is observed an attitude-behaviour gap, or also called, green gap. (Gleim & J. Lawson, 2014; Nguyen et al., 2019).

As noted, consumers are indeed interested in consuming sustainable products and are pressuring companies to act more sustainably, so we propose the following hypothesis:

***H1:*** *Sustainable Products leads to higher Purchasing Intentions.*

### 2.1.1. Attitude-behaviour gap

The attitude-behaviour gap is not a new phenomenon, it is the difference among stated intentions and actual behaviour (Nguyen et al., 2019). Past research explains that the attitude-behaviour gap can be linked to the frequency of past behaviour or the habitualness, thus is not expected to encourage environmental friendly practises, because keeping a routine does not require any elaborative process (Gleim & J. Lawson, 2014). Sustainable products are new in the market, consumers are not used to these, and an automatic behaviour is to purchase non-sustainable products (Sheeran & Webb, 2016).

Social value is the utility derived from the ability of the product to improve social self-concept concerned with symbolic value (Hur et al., 2015). It has an influence on attitude-behaviour gap. Social value shapes the perception of a product's value, consumers with higher perceived social value will have higher willingness to pay (Dangelico et al., 2021). This influence is positive on the sustainable consumption when consumers have preference for sustainable claims (Biswas & Roy, 2015). Nevertheless, social value can backfire. Research has shown that men associate sustainability with femininity, which leads to avoid all sustainable options, but if the brand has a strong masculinity association the effect can be mitigated (White, Hardisty, et al., 2019).

Personal norms also influence the attitude-behaviour gap (Dangelico et al., 2021). Personal norms refers to the perception of what is morally right, and the personal satisfaction arise from an action (Dangelico et al., 2021). Consumers begin with small sustainable action, and the satisfaction obtained can lead to more meaningful actions (White, Hardisty, et al., 2019). Having said that, the influence on the attitude-behaviour gap is not always positive. When a consumer performs an environmental friendly act, he can excuse himself from a subsequent environmental damaging act, in a concept termed licensing by researchers (Catlin & Wang, 2013; White, Hardisty, et al., 2019).

Product unavailability is another factor that influences the gap, and it influences negatively. There is a higher amount and diversity of non-sustainable products in stores, so to purchase a sustainable good it takes time to look up where to find it (Dangelico et

al., 2021). Furthermore, scepticism towards sustainable claims impacts negatively the attitude-behaviour gap, user tend to have misconceptions, there is a huge lack of knowledge and, consequently, trust on sustainable products, that is related with the not so ethical sustainable claims from some companies (Nguyen et al., 2019; Szabo & Webster, 2021).

Luchs *et al*., in 2010, presented an experience where users had to choose between a sustainable hand sanitizer and a non-sustainable sanitizer while being observer. Results showed that most users, elected the sustainable hand sanitizer. On the second approach, the users were not observed. Without social pressure users selected the non-sustainable hand sanitizer (Luchs et al., 2010). This experiment demonstrated that users feel the public pressure and thus, tend to choose the most sustainable option because is the correct one in today's society. Social pressure partly explains the prevalence of the attitude-behaviour gap even in light of high social concern for sustainable choices.

It is crucial to understand all the factors that influence positively and negatively the attitude-behaviour gap, and to either apply them on innovation, production, and marketing strategies or to learn how to overcome those negative factors ( Nguyen et al., 2019; Sheeran & Webb, 2016). Companies aim to increase the sales of sustainable products, not only because it can give those companies a competitive advantage, a brand relevance, and a higher market share, but because it is important to not deplete the natural resource and to try as much as possible to protect Earth (White, Habib, et al., 2019; White, Hardisty, et al., 2019).

### *2.2. Trust and Quality*

Consumers purchase a sustainable product because they trust in the sustainable claims. Sustainable claims are unique in nature as they cannot be assessed by consumers. It becomes an act of trust in credence value attributes (Lassoued & Hobbs, 2015). The basis of any relationship is trust and having the opportunity to strengthen this trust with users, makes it possible for companies to put themselves in a comfortable position, where there is loyalty, and the relationship is strengthened (Wang et al., 2019). Trust can be explained as the degree of willingness to believe in another party, based on expectations about the party's benevolence, ability, and integrity (Chen & Chang, 2013).

To develop new sustainable product companies, need to instil trust in consumers, so that confidence in the sustainable claims leads to behaviour. Green trust is the "*willingness to depend on a product or service based on the belief or expectation resulting from its credibility, benevolence, and ability about environmental performance*" (Chen & Chang, 2013; Chen, 2010). Additionally, the greater the knowledge about sustainable claims, the lower the perceived risk, thus the higher the green trust. Green trust is an intermediate variable connection knowledge and purchasing intentions (Wang et al., 2019).

It is important to break all misconceptions about sustainable products that consumers have, to reduce the perceived risk and scepticism. Companies can demystify the confusion by being transparent, and disclosure all the information, whether if it is good or not (Chen & Chang, 2013). By doing so, satisfaction and green trust will arise, and, consequently, it will allow companies to build up long-term relationship with users (Chen & Chang, 2013), because if there is no full disclosure of information  all the perceived risk created will lead to a prudent purchasing behaviour to escape greenwashing (Zhang et al., 2018).

Narrowing the attitude-behaviour gap is a challenge that managers and marketers face, they need to break all the misconceptions that sustainable products have and regain the consumer's broken trust (Zhang et al., 2018). A studied approach to re-establish the trust between consumers and corporations is to give them insight and become more transparent of their values when innovating and/or producing (Dangelico et al., 2021; Szabo & Webster, 2021).

As previously noted, green trust is an intermediate variable of purchasing intentions, so it can either impact positively or negatively. The negative impact on purchasing intentions can be observed if there is no trust in sustainable claims, and the explanation that can lead to this outcome is the greenwashing, which is a drawback of the attitude-behaviour gap (Nguyen et al., 2019; Wang et al., 2019).

Greenwashing can be defined as "*selective disclosure of positive information about a company's environmental or social performance without full disclosure of negative information on these dimensions, to create an overly positive corporate image*" (Nguyen et al., 2019).

The greenwashing strategy brought even more misunderstanding when consumers are, for example, buying groceries. Nguyen *et al*. presented in a study, that consumers are unable to distinguish between sustainable food from non-sustainable food, real sustainable food from greenwashed food. The authors results showed, consumers had no confidence in the credence value attributes (Lassoued & Hobbs, 2015; Nguyen et al., 2019).

Consumers are at a disadvantage when compared with companies, there is a lack of information, and asymmetry (Costa & Coelho do Vale, 2020). There is an increase of confusion and perceived risk that negatively impacts the green trust and long-term loyalty, hence, enlarges the attitude-behaviour gap (Chen & Chang, 2013).

Sustainable products are perceived as more expensive (Skard et al., 2021), and uncertain in quality and performance than non-sustainable products, therefore it makes these products as less attractive (Luchs et al., 2010). All these perceptions are defined as green scepticism, and this terms corroborates why consumers do not engage firms' environmental practices, and greenwashing just enhances green scepticism. (Jørgensen et al., 2021; Leonidou & Skarmeas, 2017; Olson, 2013).

We have seen that trust is at stake for green scepticism, but beyond that, due to lack of information and, maybe, lack of time spent on searching more about sustainable products to break all the preconceived thoughts, consumers do not have a good perception of quality (Skard et al., 2021).

Perceived quality is the consumers' judgement of the excellence of a product (Caruana & Ewing, 2010) which is established in a unique judgment (Wasaya et al., 2021). Quality can be described in value-based aspects such as physical characteristics, customer's satisfaction and compliance with consumers' wishes (Ozbekler & Ozturkoglu, 2020). And sometimes when is stated that a product is sustainable, it is interpreted poor performance, and this results to emotional and behaviour consequences, contributing to the attitude-behaviour gap (Luchs & Kumar, 2017; Skard et al., 2021). Consumers perceived quality of a product as what is expected of the service or the company, and the actual performance, if consumers perception are more than expectations, it will lead to consumers' satisfaction and loyalty (Ozbekler & Ozturkoglu, 2020). However, due to

greenwashing leading to green scepticism, the consumers perception of quality is way lower than it actually is (Skard et al., 2021).

Since both trust and quality have an influence in purchasing intentions, we propose the following hypothesis:

***H2:*** *The relationship between Sustainable Products and Purchasing Intentions is mediated by Green Trust and Quality Perception.*

### *2.3. Co-creation*

Trust has a direct influence on the perceived risk, and the greater the knowledge about sustainable product the greater the trust and the lower the perceived risk, hence companies have looked for alternatives to bring new products to the market (Wang et al., 2019). Co-creation can be a strategy to take into consideration (Costa & Coelho do Vale, 2020).

This strategy has been used by some well-known companies, like *Lego* with *Lego Ideas*[2], *Starbuck* with *My Starbucks Idea*[3] or even *Nike*, with the *Nike by You*[4]. All of the mentioned brands have created a competitive advantage and increased the intellectual value with the co-creation strategy (Dahl et al., 2015). Co-creation is a strategy that when applied and make the companies outperform competition (Nishikawa et al., 2017).

Co-creation is an active interaction between firms and users, mainly during the creation of new products that can re-establish the trust and, consequently, the brand become more authentic (Costa & Coelho do Vale, 2020). It is a process of cooperation that involves exchange of resources, like knowledge and skills for both parties (Sun et al., 2020). This approach has a strong base, because having consumer on the new product development creates objectively products that can outperform non-co-created products (Nishikawa et al., 2017; Vaqueron, 2021). Bringing consumer to the innovation process, in the short term, can increase the perception of innovation capabilities, product quality and trust

[2] https://ideas.lego.com/

[3] https://ideas.starbucks.com/

[4] https://www.nike.com/pt/nike-by-you

(Cambra-Fierro et al., 2018; Mingione et al., 2020), leading to instant and valuable competitive advantage (Rathore et al., 2016). In the long term, applying this unique method of open innovation (Kennedy, 2017; Vaquero, 2021), can increase the purchasing intentions, willingness to pay and loyalty and advocacy of the consumers (Cambra-Fierro et al., 2018; Mingione et al., 2020; Wasaya et al., 2021).

This process of open innovation can lead to greater consumers satisfaction, it impacts and enhances the brand experience, but it also can enlarge the market, by gathering new consumers (word-of-mouth) - it was cited by Dahl *et al*. that when a company involves the user in the creation of new products, it results in subtle psychological effect reacting, users feel fulfilled and feel like they had a direct and personal impact on the company's product offering (Dahl et al., 2015).

The success of co-creation does not depend, exclusively, on the consumers actively present in the creation process, nor on whether professionals are able to interpret and implement or incorporate all the feedback gathered (Mingione et al., 2020). The success of co-creation is also dependent on other consumers, those who do not have an active role in the creation process, termed as observing users (Costa & Coelho do Vale, 2018; Dahl et al., 2015; Fuchs & Schreier, 2011).

Observing users may associate co-created products as higher innovation abilities, more useful and more customer-oriented, and these perceptions can lead to a higher and stronger demand of co-created products than non-co-created products (Dahl et al., 2015; Fuchs & Schreier, 2011). This behaviour is, usually, observer in products with low development complexity (Costa & Coelho do Vale, 2018; Vaquero, 2021). Active and observing users interpret the quality, functionality of the product in the same way, which corresponds to their requirements (Costa & Coelho do Vale, 2018).

On the other hand, when products have a greater development complexity, co-creation is not seen as favourable, leading to negative outcomes (Vaquero, 2021). In these cases, active users are seen as inexperienced and with lack of knowledge to develop the complex product because observing user are more sensible to technical specifications (Costa & Coelho do Vale, 2018; Vaquero, 2021). Observing users become more sceptical and have greater trust in professionals, which will abruptly decrease the consumption of co-created products (Costa & Coelho do Vale, 2018).

### 2.3.1. Co-creation and sustainability

When consumers are part of the new product development process, there is a full disclosure of all the fears and uncertainties that are perceived by consumers (Sun et al., 2020). And with all the valuable information gathered, companies can present co-created goods that will satisfy consumers' needs (Costa & Coelho do Vale, 2020). There is a deeper knowledge of the target (Dahl et al., 2015), and it can be easier to identify and to deal with existing gaps.

As read at the beginning of this literature review, greenwashing leads to a greater scepticism when consuming sustainable products, even if the intentions were to initially purchase those products, it is observed what is called the attitude-behaviour gap (Leonidou & Skarmeas, 2017).

As companies, nowadays, aim to be more environmental responsible and want to have consumers identifying with their values, in order to increase purchase intentions and, consequently, profits, the creation of sustainable product is necessary (Dangelico & Vocalelli, 2017; Mingione et al., 2020). And if those sustainable products are co-created, it will be observed a higher identification with the company, hence higher trust (Costa & Coelho do Vale, 2020; Dahl et al., 2015).

If observing users and active users are in sync, there will be a greater demand for the co-created sustainable products, which leads to a positive perception of quality, trust, and innovation standards, and the higher prices would not be interpreted as a drawback (Costa & Coelho do Vale, 2018; Dahl et al., 2015; Mingione et al., 2020). If green trust increases, green scepticism decreases, there is a clear change of behaviour (Buerke et al., 2017).

As co-creation has greater knowledge of the consumers' uncertainties and perception, we former the following hypothesis:

***H3**: Co-creation moderates the influence of Green Trust and Quality Perception on Sustainable Products*.

*2.4. Hedonism and Utilitarianism*

Sustainable consumption can be easily affected by some external factors (Leonidou & Skarmeas, 2017). However, it is also important to understand that the type of product that users are buying can also influence the decision-making process between sustainable and non-sustainable goods (Buerke et al., 2017).

Research often relates to two types of consumption (products): hedonic and utilitarian (Stock et al., 2015). A product is classified as hedonic when it gives the consumer excitement or amusement in the act of purchase (Cheng et al., 2020; Okada, 2005). Hedonic consumption refers to an affective and sensory experience, with the consumer seeks ludic and emotional benefits from this shopping activity (Cheng et al., 2020). Hedonic products are more consumed when it is easy to justify the acquiring, there are not a first-need type of product but more a luxury one (Costa & Coelho do Vale, 2020; Okada, 2005).

Meanwhile, utilitarian products are acquired more cognitively, are more goal-oriented and accomplish a functional or product task, preferably as efficiently as possible (Cheng et al., 2020). And utilitarianism is easier to justify because it is a more thoughtful and rational purchase and less reckless (Costa & Coelho do Vale, 2020; Okada, 2005). It is important to keep in mind that utilitarianism and hedonism are not necessarily two ends of one dimension scale, this means, products can have different utilitarian and hedonic attributes (Okada, 2005).

Moreover, hedonism and utilitarianism can be seen as a motivational orientation that drives consumption behaviours (Cheng et al., 2020). It can help marketers and managers understand the psychological background behind the different levels of environmental involvement, and why it is observed such a big discrepancy between attitudes and behaviours (Cheng et al., 2020).

It was suggested, by Cheng *et al.*, that hedonic consumers can be more likely to adopt sustainable consumption because they can obtain pleasure and satisfaction from environmental actions, moreover, it is easier to justify this kind of purchase (Costa & Coelho do Vale, 2018). In addition to that, hedonic value in sustainable co-creation can

capture customers' appreciation for the intrinsic, emotional and social value of collaboration (Park & Ha, 2016).

Utilitarian consumers are less likely to adopt these sustainable co-creation actions because "*they care more about the economic benefits from the environment than the benefits to the environment*" (Cheng et al., 2020), and perhaps, the observing users and active users perception of quality in a utilitarian goods is contrary (Vaquero, 2021). Sustainable co-creation of an utilitarian good, may not result in a favourable outcome, because consumers buy utilitarian products to accomplish efficiently a functional task (Cheng et al., 2020), and for that the products need to have high quality, high functionality, and observing users do not see active users as capable of giving important and valuable feedback to such products (Costa & Coelho do Vale, 2018; Vaquero, 2021). Thus, we propose the following hypothesis:

***H4****: Consumers display higher purchase intentions for co-created sustainable products in hedonic consumption than in utilitarian consumption.*

## 3. Methodology and Research Framework

In this chapter, it will be tested the hypotheses already presented, through experimental design study, the experiments used have four features, manipulation, control, random assignment, and random sampling. Experimental design study is the most suitable approach to test our hypotheses because it involves manipulation of the variables to study its causal relationship. Numerous participants will be testing different scenarios for the design mode (co-creation vs. professionals), sustainability (sustainable products vs. non-sustainable product) and product type (utilitarian vs. hedonic).

In Study 1 it will be present an utilitarian product, a toner with an ink tank, and through this study all hypotheses will be tested. Study 2 will have a hedonic product, an ice cream, and, once again, all the hypotheses will be tested. We aim to study if consumers have preferable purchasing intentions when presented to sustainable utilitarian or hedonic product instead of non-sustainable utilitarian or hedonic products. Furthermore, it will be evaluated if this relationship is mediated by green trust and quality perception, and later if co-creation moderates the mediators.

Studies were developed on Qualtrics and were both shared on Amazon's Mechanical Turk (MTurk) and among the author's networks. During the survey there was an attention check, all the MTurk's participants were informed that it was mandatory to answer correctly to be rewarded.

### *3.1. Study 1 – Printer with ink tank*

The study follows a between design subject 2 (design mode: co-created vs. professionals) x 2 (sustainability: sustainable vs. non-sustainable).

258 participants answered the survey, however, 12 were excluded due to failures on the attention check question, resulting in 246 valid responses. 61.79% of the participants were males. The most predominant age gap is 25 – 34 with 57.72%, and the majority of the participants are from the US, 69.11%. The most predominant answer to household income was 50 000€ or more with 31.71%. All the results can be observed in the Appendix, Table 14.

#### 3.1.1. Method

Participants were asked to imagine themselves in a situation that they work for a company that needed to buy a new printer, and they were in charge of this function. Then, randomly, participants were assigned to a different design mode (co-creation vs. professionals) and a different printer (sustainable vs. non-sustainable), and they could read the product's specification, it can be observed in Appendix, Figure 3 (designed by professionals) and Figure 4 (co-created).

Firstly, participants answered two manipulation questions, the first one was about if the presented product was sustainable or non-sustainable, and the other was about how designed the product, these questions were included on the survey to know if the participants understood the scenario proposed. Afterwards, the participants had to rate their degree of agreement with the statements presented on green trust, statements that came from the literature (Chen, 2010). Participants also had to rate the degree of likelihood of the statements presented on quality perception (Dodds et al., 1991). Also, the degree of agreement with the statements presented on green values (Haws et al., 2014). And at last, participants' likelihood to purchase the proposed product (Mohr & Webb, 2005). Participants were asked if they were familiar with co-creation (Schreier et al., 2012). At the end of the survey, participants answered questions about their demographics.

### 3.1.2. Measures

Table 1 presents all the items of the constructs used on the survey. The answers used a 7-point Likert scale.

*Table 1 - Study's 1 Measures.*

| Variables | Items | Measurement & Source |
|---|---|---|
| *Manipulation check* | I find this product:<br>"Very non-green" (1) to "Very green" (7)<br>Who developed this product?<br>"Consumers only" (1); "Consumers and company professionals" (2) and "Company professionals only" (3) | Own construct |
| *Green Trust* | (...) environmental functions are generally reliable. | "Strongly disagree" (1) to "Strongly agree" (7) (Chen, 2010) |
| | (...) environmental performance is generally dependable. | |
| | (...) the environmental argument is generally trustworthy. | |
| | (...) environmental concern meets my expectations. | |
| | (...) keeps promises and commitments for environmental protection. | |
| *Quality Perception* | The likelihood that the product would be reliable is. | "Very low" (1) to "Very high" (7) (Dodds et al., 1991) |
| | The workmanship of product would be. | |
| | The likelihood that this product is dependable is. | |
| | This product's quality should be | |
| | The durability of this product would be | |
| *Green Values* | It is important to me that the products I use do not harm the environment. | "Strongly disagree" (1) to "Strongly agree" (7) (Haws et al., 2014) |
| | I consider the potential environmental impact of my actions when making many of my decisions. | |
| | My purchase habits are affected by my concern for our environment. | |
| | I am concerned about wasting the resources of our planet. | |
| | I would describe myself as environmentally responsible. | |
| | I am willing to be inconvenienced to take actions that are more environmentally friendly. | |
| *Purchasing Intentions* | The likelihood of purchasing this printer is. | "Very low" (1) to "Very high" (7) (Mohr & Webb, 2005) |
| | The probability I would consider buying this printer is. | |
| | My willingness to buy this printer is. | |
| *Co-creation* | Are you familiar with co-creation? "Yes" or "No" | Adapted from (Schreier et al., 2012) |
| *Demographics* | Gender; age; country; annual household income. | Own construct |

### 3.1.3. Manipulation check and Reliability Analysis

The manipulation question was included in the survey to comprehend whether participants were able to distinguish the design mode and the sustainability in the scenario assigned. It was performed an One-Way ANOVA, and the results show a significant

difference between the means for both scenarios. $M_{Professionals}$=2.21, $M_{Co\text{-}created}$=1.91 with *p-value*=0.001 (<0.05) and $M_{Sustainable}$=5.17, $M_{Non\text{-}sustainable}$=3.79 with *p-value*=0.001 (<0.05), hence the scenarios were understood.

In Table 2 can be observed the Cronbach' Alpha calculated for each item, as well as the corrected item-total correlation.

*Table 2 - Reliability Analysis for Study 1.*

| Variables | Items | Corrected Item-Total Correlation | Cronbach's Alpha |
|---|---|---|---|
| *Green Trust* | (...) environmental functions are generally reliable. | 0.757 | 0.904 |
| | (...) environmental performance is generally dependable. | 0.777 | |
| | (...) the environmental argument is generally trustworthy. | 0.771 | |
| | (...) environmental concern meets my expectations. | 0.733 | |
| | (...) keeps promises and commitments for environmental protection. | 0.763 | |
| *Quality Perception* | The likelihood that the product would be reliable is. | 0.665 | 0.809 |
| | The workmanship of product would be. | 0.617 | |
| | The likelihood that this product is dependable is. | 0.605 | |
| | The durability of this product would be | 0.620 | |
| *Green Values* | It is important to me that the products I use do not harm the environment. | 0.603 | 0.836 |
| | I consider the potential environmental impact of my actions when making many of my decisions. | 0.645 | |
| | My purchase habits are affected by my concern for our environment. | 0.649 | |
| | I am concerned about wasting the resources of our planet. | 0.575 | |
| | I would describe myself as environmentally responsible. | 0.586 | |
| | I am willing to be inconvenienced to take actions that are more environmentally friendly. | 0.613 | |
| *Purchasing Intentions* | The likelihood of purchasing this product is. | 0.705 | 0.840 |
| | The probability I would consider buying this product is. | 0.702 | |
| | My willingness to buy this product is. | 0.706 | |

Reliability analysis shows values of Cronbach's Alpha over 0.8, variables of Green Trust (α=0.904) and Green Values (α=0.852) present values higher than 0.8, meaning that it is a very good level of reliability (Ursachi et al., 2015). The variables of Quality Perception (α=0.779) and Purchasing Intentions (α=0.742) still present values with a good level of reliability (Ursachi et al., 2015). For this analysis one item was excluded from the Quality Perception, apart from the excluded value, all the corrected item-total correlation values were acceptable. Furthermore, the variables Green Trust, Quality Perception, Green Values and Purchasing Intentions were formed with the means of all the items in each construct.

### 3.1.4. Results

***H1:*** *Sustainable Products leads to higher Purchasing Intentions.*

H1 hypothesis that consumers prefer sustainable to non-sustainable products. To test this relationship, we run a linear regression, independent variable is the Sustainability Scenario, and dependent variable is Purchasing Intentions. Sustainability presented a significant and positive coefficient ($\beta$=0.563 with *p-value*<0.001).

*Hence, H1 is accepted.*

***H2:*** *The relationship between Sustainable Products and Purchasing Intentions is mediated by Green Trust and Quality Perception.*

H2 hypothesis that green trust and quality perception can mediate the purchasing intention of sustainable products, over non sustainable ones. To test this mediation, a bootstrapping analysis by Preacher and Hays, using PROCESS Model 4, was performed (Preacher & Hayes, 2004). Independent variable is the Sustainability Scenario, dependent variable is Purchasing Intentions. As mediators we have Quality Perception and Green Trust. All the results obtained from this analysis can be observed in the Table 4.

*Table 3 - Mediation Analysis for Study 1.*

| | **Variable** | **Coefficient** | **p-value** | **Observation** |
|---|---|---|---|---|
| *Green Trust* | Sustainability | 0.777 | 0.000 | significant |
| *Quality Perception* | Sustainability | 0.376 | 0.003 | significant |
| *Purchasing Intentions* | Sustainability | -0.028 | 0.725 | not significant |
| | Green Trust | 0.460 | 0.000 | significant |
| | Quality Perception | 0.538 | 0.000 | significant |
| | | *Indirect Effect X on Y* | | |
| **Variable** | **Coefficient** | **BootLLCI** | **BootULCI** | **Observation** |
| Green Trust | 0.418 | 0.207 | 0.686 | mediation effect |
| Quality Perception | 0.173 | 0.054 | 0.311 | mediation effect |

The Sustainability variable have a significant positive effect on Green Trust ($\beta$=0.777, *p-value*=0.000), and on Quality Perception ($\beta$=0.376, *p-value*=0.003), but is not significant on Purchasing Intentions ($\beta$=-0.028, *p-value*=0.725).

The mediators, Green Trust and Quality Perception variables have a significant positive effect on Purchasing Intentions ($\beta$=0.460, *p-value*=0.000; $\beta$=0.538 and *p-value*=0.000), Quality Perception is a better predictor.

The indirect effect of Sustainability on Purchasing Intentions via Green Trust is 0.418 and it is statistically significant, given 0 does not fall on the confidence interval [0.207 – 0.686]. The indirect effect of Sustainability on Purchasing Intentions via Quality Perception is 0.173 and it is statistically significant, given 0 does not fall on the confidence interval [0.054 – 0.311]. These results state that only the mediators influence Purchasing Intentions.

*Hence, H2 is accepted.*

***H3**: Co-creation moderates the influence of Green Trust and Quality Perception on Sustainable Products.*

H3 hypothesis that co-creation will moderate the influence of the mediators on the purchasing intention of sustainable products, over non-sustainable ones. To test this moderation, a bootstrapping analysis by Preacher and Hays, using PROCESS Model 1, was performed (Preacher & Hayes, 2004). Independent variable is the Sustainability Scenario, dependent variable is Purchasing Intentions. As moderator we have Co-creation. All the results obtained from this analysis can be observed in the Table 4.

*Table 4 - Moderation Analysis using Model 1 for Study 1.*

| | **Variable** | **Coefficient** | **p-value** | **Observation** |
|---|---|---|---|---|
| *Purchasing Intentions* | Sustainability | 0.318 | 0.146 | Not significant |
| | Co-creation | -0.699 | 0.0025 | Significant |
| | Interaction term | 0.4103 | 0.170 | Not significant |

Looking at the results, Co-creation is a significant and negative moderator on Purchasing Intentions ($\beta$=-0.699 and *p-value*=0.0025), which means, when presenting an utilitarian product consumers prefer a professional option.

The interaction term (Sustainability x Co-creation) is not significant (*p-value*=0.170).

*Hence, H3 accepted.*

To explain why co-creation negatively influences the Purchasing Intentions, a bootstrapping analysis by Preacher and Hays, using PROCESS Model 7, was performed (Preacher & Hayes, 2004). Independent variable is the Sustainability Scenario, dependent variable is Purchasing Intentions. As mediators we have Quality Perception and Green Trust and Co-creation as moderator. We analysed the mediator separately. All the results obtained from this analysis can be observed in Table 5 and Table 6.

*Table 5 - Model 7 with Green Trust as mediator for Study 1.*

| | **Variable** | **Coefficient** | **p-value** | **Observation** |
|---|---|---|---|---|
| *Green Trust* | Sustainability | 0.451 | 0.050 | Partially significant |
| | Co-creation | -0.662 | 0.006 | Significant |
| | Interaction term | 0.574 | 0.070 | Partially significant |

Co-creation is a negative and significant predictor of Green Trust (*β*=-0.662 and *p-value*= 0.006). This means that when presenting an utilitarian co-created sustainable printer, consumers perceive green trust negatively, the sustainable claims are not trustable.

Sustainability is a positive and partially significant predictor of Green Trust (*β*=0.451 and *p-value*=0.050), and the interaction term (Sustainability x Co-creation) on Green Trust is positive and partially significant (*β*=0.574 and *p-value*=0.070), meaning that the slope for the effect of Sustainability on Green Trust varies across levels of Co-creation, and the other way around due to symmetricity on the interaction. If the confidence interval (CI) was 10%, sustainability and the interaction term would be significant.

Looking at the same analysis but with Quality Perception as mediator. Co-creation is a negative and partially significant predictor of Quality Perception (*β*=-0.327 and *p-value*= 0.094) if CI was 10% it would be significant. This means that when presenting an utilitarian co-created sustainable printer, consumers perceive quality negatively. Sustainability and the Interaction term are not significant. From this analysis, co-creation on a sustainable and utilitarian product is perceived as a liability.

*Table 6 - Model 7 with Quality Perception as mediator for Study 1.*

| | Variable | Coefficient | p-value | Observation |
|---|---|---|---|---|
| *Quality Perception* | Sustainability | 0.224 | 0.230 | Not significant |
| | Co-creation | -0.327 | 0.094 | Partially significant |
| | Interaction term | 0.268 | 0.291 | Not significant |

### *3.2.Study 2 – Ice Cream*

The study follows a 2 (design mode: co-created vs. professionals) x 2 (sustainability: sustainable vs. non-sustainable).

214 participants answer the survey, however, 23 were excluded due to failures on the attention check question, resulting in 191 valid responses. 54.45% of the participants were females. The most predominant age gap is 25 – 34 with 52.36%, and the majority of the participants are from the US, 54.45%. The most predominant answer to household income was 20 000 – 29 000€ with 20.42%. All the results can be observed in the Appendix, Table 8.

#### 3.2.1. Method

Participants were asked to imagine themselves in a supermarket with "ice cream" written on their shopping list. Then, randomly, participants were assigned to a different design mode (co-creation vs. professionals) and a different ice cream (sustainable vs. non-sustainable), and they could read the nutrition declaration, it can be observed in Appendix, Figure 5.

Firstly, participants answered two manipulation questions, the first one was about if the presented product was sustainable or non-sustainable, and the other was about how designed the product, these questions were included on the survey to know if the participants understood the scenario proposed. Afterwards, the participants had to rate their degree of agreement with the statements presented on green trust, statements that came from the literature (Y.-S. Chen, 2010). Participants also had to rate the degree of likelihood of the statements presented on quality perception (Dodds et al., 1991). Also, the degree of agreement with the statements presented on green values (Haws et al., 2014). And at last, participants' likelihood to purchase the proposed product (Mohr & Webb, 2005). Participants were asked if they were familiar with co-creation (Schreier et al., 2012). At the end of the survey, participants answered questions about their demographics.

### 3.2.2. Measures

Table 7 presents all the items of the constructs used on the survey. The answers used a 7-point Likert scale.

*Table 7 - Study's 1 Measures.*

| Variables | Items | Measurement & Source |
|---|---|---|
| *Manipulation check* | I find this product:<br>"Very non-green" (1) to "Very green" (7)<br>Who developed this product?<br>"Consumers only" (1); "Consumers and company professionals" (2) and "Company professionals only" (3) | Own construct |
| *Green Trust* | (...) environmental functions are generally reliable. | "Strongly disagree" (1) to "Strongly agree" (7) (Chen, 2010) |
| | (...) environmental performance is generally dependable. | |
| | (...) the environmental argument is generally trustworthy. | |
| | (...) environmental concern meets my expectations. | |
| | (...) keeps promises and commitments for environmental protection. | |
| *Quality Perception* | The likelihood that the product would be reliable is. | "Very low" (1) to "Very high" (7) (Dodds et al., 1991) and adapted from (Hansen, 2005) |
| | The likelihood that this ice cream would be tasteful is. | |
| | The likelihood that this product is dependable is. | |
| | This product's quality should be | |
| *Green Values* | It is important to me that the products I use do not harm the environment. | "Strongly disagree" (1) to "Strongly agree" (7) (Haws et al., 2014) |
| | I consider the potential environmental impact of my actions when making many of my decisions. | |
| | My purchase habits are affected by my concern for our environment. | |
| | I am concerned about wasting the resources of our planet. | |
| | I would describe myself as environmentally responsible. | |
| | I am willing to be inconvenienced to take actions that are more environmentally friendly. | |
| *Purchasing Intentions* | The likelihood of purchasing this printer is. | "Very low" (1) to "Very high" (7) (Mohr & Webb, 2005) |
| | The probability I would consider buying this printer is. | |
| | My willingness to buy this printer is. | |
| *Co-creation* | Are you familiar with co-creation? "Yes" or "No" | Adapted from (Schreier et al., 2012) |
| *Demographics* | Gender; age; country; annual household income. | Own construct |

### 3.2.3. Manipulation check and Reliability Analysis

The manipulation question was included in the survey to comprehend whether participants were able to distinguish the design mode and the sustainability in the scenario assigned. It was performed an One-Way ANOVA, and the results show a significant

difference between the means for both scenarios. $M_{Professionals}$=2.23, $M_{Co\text{-}created}$=1.94 with *p-value*=0.004 (<0.05) and $M_{Sustainable}$=5.39, $M_{Non\text{-}sustainable}$=4.22 with *p-value*=0.001 (<0.05), hence the scenarios were understood.

In Table 8 can be observed the Cronbach' Alpha calculated for each item, as well as the corrected item-total correlation.

*Table 8 - Reliability Analysis for Study 2.*

| Variables | Items | Corrected Item-Total Correlation | Cronbach's Alpha |
|---|---|---|---|
| *Green Trust* | (...) environmental functions are generally reliable. | 0.781 | 0.900 |
| | (...) the environmental argument is generally trustworthy. | 0.754 | |
| | (...) environmental concern meets my expectations. | 0.790 | |
| | (...) keeps promises and commitments for environmental protection. | 0.797 | |
| *Quality Perception* | The likelihood that the product would be reliable is. | 0.706 | 0.845 |
| | The likelihood that this product would be tasteful is. | 0.638 | |
| | The likelihood that this product performs well is. | 0.732 | |
| | This product's quality should be | 0.652 | |
| *Green Values* | It is important to me that the products I use do not harm the environment. | 0.602 | 0.868 |
| | I consider the potential environmental impact of my actions when making many of my decisions. | 0.686 | |
| | My purchase habits are affected by my concern for our environment. | 0.614 | |
| | I am concerned about wasting the resources of our planet. | 0.668 | |
| | I would describe myself as environmentally responsible. | 0.691 | |
| | I am willing to be inconvenienced to take actions that are more environmentally friendly. | 0.741 | |
| *Purchasing Intentions* | The likelihood of purchasing this product is. | 0.784 | 0.900 |
| | The probability I would consider buying this product is. | 0.814 | |
| | My willingness to buy this product is. | 0.812 | |

Reliability analysis shows values of Cronbach's Alpha greater than 0.8, the values are higher than 0.8 variables, Green Trust (α=0.900), Quality Perception (α=0.845) and Purchasing Intentions (α=0.900), and Green Values (α=0.868), meaning that it is a very good level of reliability (Ursachi et al., 2015). For this analysis no item was excluded, all the corrected item-total correlation present values higher than 0.6, hence it is acceptable. Moreover, the variables Green Trust, Quality Perception, Green Values and Purchasing Intentions were formed with the means of all the items in each construct.

### 3.2.4. Results

***H1:*** *Sustainable Products leads to higher Purchasing Intentions.*

H1 hypothesis that consumers prefer sustainable to non-sustainable products. To test this relationship, we run a linear regression, independent variable is the Sustainability Scenario, and dependent variable is Purchasing Intentions. Sustainability presented a significant and positive coefficient ($\beta$=0.360 with *p-value*=0.028).

*Hence, H1 is accepted.*

***H2:*** *The relationship between Sustainable Products and Purchasing Intentions is mediated by Green Trust and Quality Perception.*

H2 hypothesis that green trust and quality perception can mediate the purchasing intention of sustainable products, over non sustainable ones. To test this mediation, a bootstrapping analysis by Preacher and Hays, using PROCESS Model 4, was performed (Preacher & Hayes, 2004). Independent variable is the Sustainability Scenario, dependent variable is Purchasing Intentions. As mediators we have Quality Perception and Green Trust. All the results obtained from this analysis can be observed in the Table 9.

*Table 9 - Mediation Analysis for Study 2.*

| | **Variable** | **Coefficient** | **p-value** | **Observation** |
|---|---|---|---|---|
| *Green Trust* | Sustainability | 0.543 | 0.000 | significant |
| *Quality Perception* | Sustainability | 0.292 | 0.015 | significant |
| *Purchasing Intentions* | Sustainability | -0.041 | 0.693 | not significant |
| | Green Trust | 0.303 | 0.000 | significant |
| | Quality Perception | 0.810 | 0.000 | significant |
| | | *Indirect Effect X on Y* | | |
| **Variable** | **Coefficient** | **BootLLCI** | **BootULCI** | **Observation** |
| Green Trust | 0.165 | 0.066 | 0.290 | mediation effect |
| Quality Perception | 0.236 | 0.045 | 0.446 | mediation effect |

The Sustainability variable have a significant positive effect on Green Trust ($\beta$=0.543, *p-value*=0.000), and on Quality Perception ($\beta$=0.292, *p-value*=0.015), but is not significant on Purchasing Intentions ($\beta$=-0.041, *p-value*=0.693).

The mediators, Green Trust and Quality Perception variables have a significant positive effect on Purchasing Intentions ($\beta$=0.810, *p-value*=0.000; $\beta$=0.303 and *p-value*=0.000, respectively), Quality Perception is a better predictor.

The indirect effect of Sustainability on Purchasing Intentions via Green Trust is 0.165 and it is statistically significant, given 0 does not fall on the confidence interval [0.066 – 0.290]. The indirect effect of Sustainability on Purchasing Intentions via Quality Perception is 0.236 and it is statistically significant, given 0 does not fall on the confidence interval [0.045 – 0.446 ]. These results state that only the mediators influence Purchasing Intentions.

*Hence, H2 is accepted.*

***H3**: Co-creation moderates the influence of Green Trust and Quality Perception on Sustainable Products.*

H3 hypothesis that co-creation will moderate the influence of the mediators on the purchasing intention of sustainable products, over non-sustainable ones. To test this moderation, a bootstrapping analysis by Preacher and Hays, using PROCESS Model 1, was performed (Preacher & Hayes, 2004). Independent variable is the Sustainability Scenario, dependent variable is Purchasing Intentions. As moderator we have Co-creation. All the results obtained from this analysis can be observed in the Table 10.

*Table 10 - Moderation Analysis using Model 1 for Study 2.*

| | **Variable** | **Coefficient** | **p-value** | **Observation** |
|---|---|---|---|---|
| *Purchasing Intentions* | Sustainability | 0.265 | 0.250 | Not significant |
| | Co-creation | -0.033 | 0.888 | Not significant |
| | Interaction term | 0.190 | 0.563 | Not significant |

Looking at the results, Co-creation is not a significant moderator on Purchasing Intentions (*p-value*=0.888), which means, when presenting a hedonic product to consumers, it does not matter who designed it. The interaction term (Sustainability x Co-creation) is not significant (*p-value*=0.563).

*Hence, H3 is rejected*.

### *3.3. Hypothesis 4*

***H4**: Consumers display higher purchase intentions for co-created sustainable products in hedonic consumption than in utilitarian consumption.*

To test this hypothesis, we compared the results of Hypothesis 3 in study 1 and study 2. In the case of utilitarian products, co-creation shows a moderation effect on Green Trust ($\beta$=-0.662, *p-value*=0.006) and Quality Perception ($\beta$=-0.327, *p-value*=0.094) on Sustainable Products. Interestingly, the moderation has a negative value ($\beta$=-0.699, *p-value*=0.0025), which means that quality perceptions and even the green trust in the sustainable claim are weaker. As such, consumers prefer the professional option.

In the case of hedonic product, our results do not show a moderation effect co-creation ($\beta$=-0.033, *p-value*=0.888) does not moderate Green Trust not Quality Perception on Sustainable Products. As such, we can conclude that communication that a sustainable product was co-created with other consumers does not changes observing consumers' perceptions about the product. We found no effect on consumers' purchase intention.

*Hence, H4 is rejected*.

## 4. Conclusions and Implications

The main purpose of this dissertation is to answer the research question "*Can co-creation increase the trust and quality perception in sustainable product and, consequently, increase the purchasing intentions?*". The answer to this question is aligned with studies auguring that green washing has increase consumers' scepticism in sustainable products (Chen & Chang, 2013). This dissertation studied the influence of trust and quality perception in the purchasing intention of hedonic or utilitarian sustainable products. The literature describes that co-creation can influence the purchasing intentions of new products (Cambra-Fierro et al., 2018; Mingione et al., 2020; Wasaya et al., 2021). This method of open innovation can be an alternative to overcome the existing attitude-behaviour gap and all the issues green scepticism created, due to greenwashing (Costa & Coelho do Vale, 2020; Dahl et al., 2015).

Our findings start by confirming that consumers prefer sustainable products. For both consumption types (hedonic and utilitarian), the sustainable products displays higher purchase intention than non-sustainable choices, and it leads to a higher purchasing intention. This result is aligned with literature claiming that users have preference for sustainable products when there is such option (Dangelico et al., 2021; Skard et al., 2021; White, Habib, et al., 2019).

Due to all green scepticism created by greenwashing, green trust and quality have been the key mediators in the relationship between sustainable products and purchasing intention. If there is scepticism there is no trust on the sustainable claim and the quality of the product will be perceived as low, hence purchasing intention will be negatively affected (Jørgensen et al., 2021; Leonidou & Skarmeas, 2017; Luchs & Kumar, 2017; Skard et al., 2021). In our Hypothesis 2, it was explored if there was a mediation effect. Our findings suggest that there is, indeed, a mediation effect of green trust and quality perception between sustainable product and purchasing intentions, with no evidence of sceptical consumers in sustainable products. According to our results, claiming that either an utilitarian or hedonic product is sustainable leads to a significant and positive perception of quality and green trust, and consequently to a significant and positive influence on purchasing intentions.

Upon to this point, our findings suggest that claiming that a product is sustainable leads to higher purchasing intentions and this relationship is mediated by green trust and quality perception. So can co-creation moderate the influence of the mediators – this was what we aimed to find with Hypothesis 3.

Our findings suggest that communicating to the broader markets that the firm co-created the new sustainable utilitarian product, did not influence positively consumers' perceptions about the product, namely green trust and perceived quality. We can affirm, that the observing consumers, our survey participants, do not find active users to be capable of giving valuable and informative feedback for such complex product, this is in line with some literature (Costa & Coelho do Vale, 2018; Vaquero, 2021), co-creation and high complexity does not really work. Regarding our sample for the sustainable hedonic product, it is indifferent to claim if the product is co-created or not, co-creation as a moderator is not significant, which is quite surprising and against our theorization (Costa & Coelho do Vale, 2018; Park & Ha, 2016; Vaquero, 2021), however, we already observed a positive and significant influence on purchasing intentions just by claiming that the product is sustainable, hence it was not really observed any green scepticism.

### *4.1. Managerial Implications*

The urge of more environmental friendly strategies on companies, created alternatives paths to reduce the consumption of natural resources and to protect Earth (Ashrafi et al., 2018; Sun et al., 2020), but it also lead to companies claiming dishonest sustainable claims, greenwashing, causing lot of scepticism when this kind of products are developed and put in the market (Nguyen et al., 2019; Skard et al., 2021).

Part of this dissertation shows evidence to managers and marketers that communicating co-creating sustainable utilitarian products can have detrimental effects on consumers trust and quality perception. If the company aims to increase the purchasing intentions of sustainable products. Moreover, when presenting a hedonic product claiming it as co-created, might not, influence the purchasing intention.

### *4.2.Theoretical Implications*

Although there can easily find extensive research in the fields of sustainable production and consumption, in consumption of hedonic and utilitarian goods, as well as in co-creation innovation, this dissertation complements the literature (Costa & Coelho do Vale, 2018) by combining all of these subjects.

This dissertation validates that claiming a co-created sustainable utilitarian product, with does not have a positive influence on purchasing intention, observing users are sceptical to co-creation, as we have previously theorized. Furthermore, when it is presented a hedonic sustainable product and it is claimed as co-creation, it is not observed any difference, which is a surprising and new result.

## 5. Limitation and Future research

This dissertation has some limitations. The first one to point out is the fact the studies performed only focused on consumers' co-creation. Consumers were, in these studies, the stakeholders used to succeed in re-establishing the trust broken by greenwashing and green scepticism, the results obtained were valuables. Though, future researchers can include different stakeholders as co-creators.

Due to lack of time and resources, the number of participants were on average around 100 per study, the samples are small, and it can lead to misconceptions. Moreover, the majority of the answer were obtained on Amazon MTurk, and as is known, on this platform the participants are paid when answering surveys, which can be a disadvantage, the efforts input on survey cannot be the best and they might be answering it just for extrinsic motives. Also, the majority of the participants are from the USA, there is not much diversity or representation.

For future research, it could be interesting to study again the co-creation of sustainable products on both types of consumption but with larger samples, particularly, for the hedonic product. Moreover, for the utilitarian sustainable product, co-creation could be tested on different levels of complexity.

In conclusion, this dissertation presents valuable insights in the co-creation of sustainable products on both types of consumption, nonetheless, invites future research.

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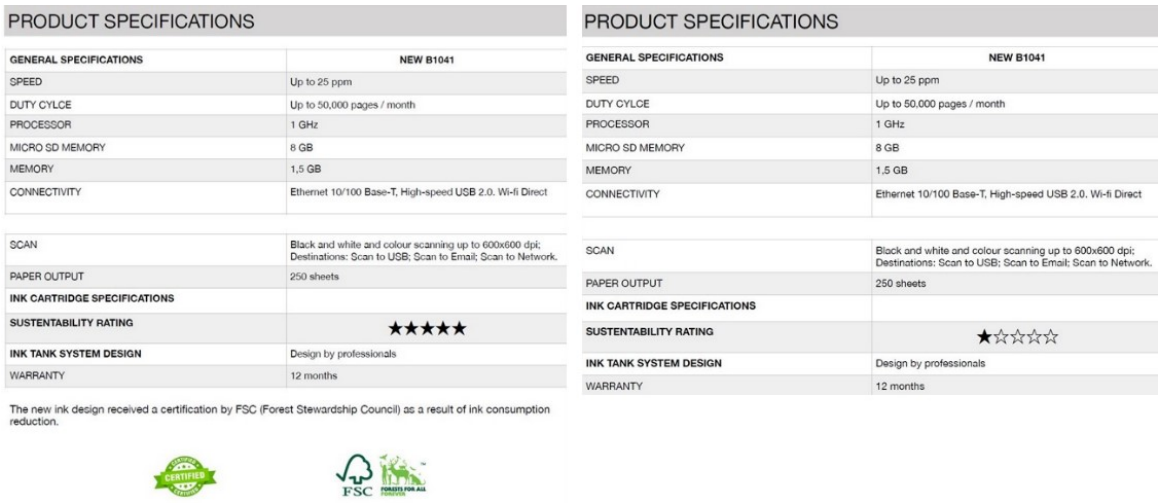
## Appendix



PRODUCT SPECIFICATIONS

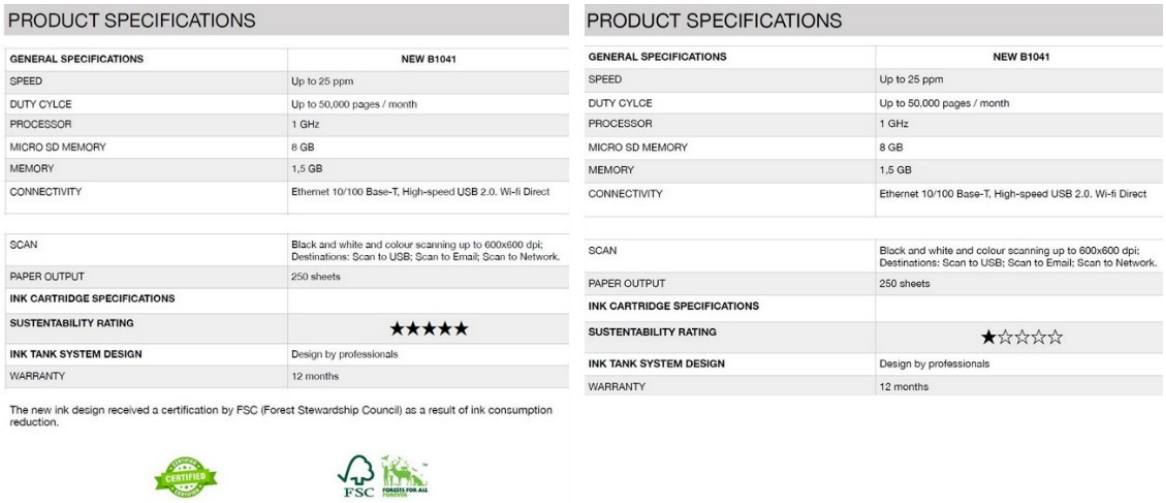
| GENERAL SPECIFICATIONS | NEW B1041 |
|---|---|
| SPEED | Up to 25 ppm |
| DUTY CYLCE | Up to 50,000 pages / month |
| PROCESSOR | 1 GHz |
| MICRO SD MEMORY | 8 GB |
| MEMORY | 1,5 GB |
| CONNECTIVITY | Ethernet 10/100 Base-T, High-speed USB 2.0. Wi-fi Direct |
| SCAN | Black and white and colour scanning up to 600x600 dpi; Destinations: Scan to USB; Scan to Email; Scan to Network. |
| PAPER OUTPUT | 250 sheets |
| INK CARTRIDGE SPECIFICATIONS | |
| SUSTENTABILITY RATING | ★★★★★ |
| INK TANK SYSTEM DESIGN | Design by professionals |
| WARRANTY | 12 months |

The new ink design received a certification by FSC (Forest Stewardship Council) as a result of ink consumption reduction.

PRODUCT SPECIFICATIONS

| GENERAL SPECIFICATIONS | NEW B1041 |
|---|---|
| SPEED | Up to 25 ppm |
| DUTY CYLCE | Up to 50,000 pages / month |
| PROCESSOR | 1 GHz |
| MICRO SD MEMORY | 8 GB |
| MEMORY | 1,5 GB |
| CONNECTIVITY | Ethernet 10/100 Base-T, High-speed USB 2.0. Wi-fi Direct |
| SCAN | Black and white and colour scanning up to 600x600 dpi; Destinations: Scan to USB; Scan to Email; Scan to Network. |
| PAPER OUTPUT | 250 sheets |
| INK CARTRIDGE SPECIFICATIONS | |
| SUSTENTABILITY RATING | ★☆☆☆☆ |
| INK TANK SYSTEM DESIGN | Design by professionals |
| WARRANTY | 12 months |

*Figure 3 – Product's specifications for scenarios 1 and 2 (sustainable vs non-sustainable).*



PRODUCT SPECIFICATIONS

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| CONNECTIVITY | Ethernet 10/100 Base-T, High-speed USB 2.0. Wi-fi Direct |
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| INK CARTRIDGE SPECIFICATIONS | |
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PRODUCT SPECIFICATIONS

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| MICRO SD MEMORY | 8 GB |
| MEMORY | 1,5 GB |
| CONNECTIVITY | Ethernet 10/100 Base-T, High-speed USB 2.0. Wi-fi Direct |
| SCAN | Black and white and colour scanning up to 600x600 dpi; Destinations: Scan to USB; Scan to Email; Scan to Network. |
| PAPER OUTPUT | 250 sheets |
| INK CARTRIDGE SPECIFICATIONS | |
| SUSTENTABILITY RATING | ★☆☆☆☆ |
| INK TANK SYSTEM DESIGN | Design by professionals |
| WARRANTY | 12 months |

*Figure 4 – Product's specification for scenarios 3 and 4 (co-created sustainable vs co-created non-sustainable).*

*Table 9 - Demographics for the functional product for Study 1.*

| | | Frequency | Percentages (%) |
|---|---|---|---|
| **Gender** | Female | 94 | 38.21 |
| | Male | 152 | 61.79 |
| **Age** | 18 – 24 | 20 | 8.13 |
| | 25 – 34 | 142 | 57.72 |
| | 35 – 44 | 50 | 20.33 |
| | 45 – 54 | 18 | 7.32 |
| | 55 or older | 16 | 6.50 |
| **Country of residence** | American Samoa | 4 | 1.63 |
| | Brazil | 4 | 1.63 |
| | Canada | 1 | 0.41 |
| | Cambodia | 1 | 0.41 |
| | Colombia | 1 | 0.41 |
| | Georgia | 3 | 1.22 |
| | India | 30 | 12.20 |
| | Moldova | 1 | 0.41 |
| | New Zealand | 1 | 0.41 |
| | Poland | 1 | 0.41 |
| | Portugal | 27 | 10.98 |
| | United States | 170 | 69.11 |
| | Virgin Islands | 2 | 0.81 |
| **Annual household income** | Less than €10,000 | 9 | 3.66 |
| | €10,000 - €19,999 | 21 | 8.54 |
| | €20,000 - €29,999 | 34 | 13.82 |
| | €30,000 - €39,999 | 49 | 19.92 |
| | €40,000 - €49,999 | 55 | 22.36 |
| | €50,000 or more | 78 | 31.71 |

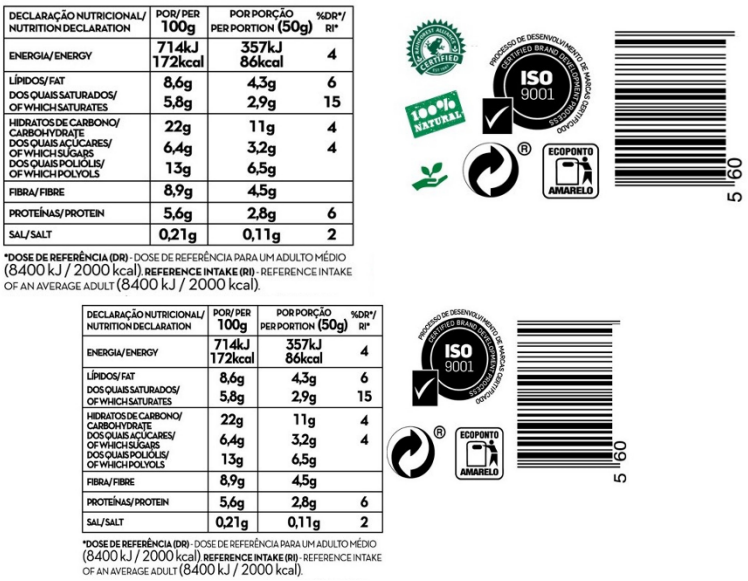


*Figure 5- Product's nutrition declaration label for the four scenarios.*

*Table 10 - Demographics for the hedonic product for Study 2.*

| | | Frequency | Percentages (%) |
|---|---|---|---|
| **Gender** | Female | 104 | 54.45 |
| | Male | 87 | 45.55 |
| **Age** | 18 – 24 | 20 | 10.47 |
| | 25 – 34 | 100 | 52.36 |
| | 35 – 44 | 45 | 23.56 |
| | 45 – 54 | 16 | 8.38 |
| | 55 or older | 10 | 5.24 |
| **Country of residence** | Australia | 4 | 2.09 |
| | Bangladesh | 1 | 0.52 |
| | Belgium | 1 | 0.52 |
| | Germany | 3 | 1.57 |
| | Italy | 1 | 0.52 |
| | Lesotho | 1 | 0.52 |
| | Monaco | 1 | 0.52 |
| | Pakistan | 1 | 0.52 |
| | Portugal | 73 | 38.22 |
| | United Arab Emirates | 1 | 0.52 |
| | United States | 104 | 54.45 |
| **Annual household income** | Less than €10,000 | 19 | 9.95 |
| | €10,000 - €19,999 | 37 | 19.37 |
| | €20,000 - €29,999 | 39 | 20.42 |
| | €30,000 - €39,999 | 22 | 11.52 |
| | €40,000 - €49,999 | 36 | 18.85 |
| | €50,000 or more | 38 | 19.90 |