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Co-creation as a tool to develop trust and intention to purchase green products

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Abstract

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Consumers expect companies to become more ecological conscious and to develop more green alternatives products. However, the skepticism towards companies' green claims, have putting consumers unwilling to trust and purchase this type of products.

Literature shows that co-creation increases levels of trust and intention to purchase among consumers. Individuals tend to have higher levels of attraction towards people with similar attitudes. Furthermore, companies that develop co-creation are perceived as being more consumer-centric, causing positive attitudes that will lead to higher intentions to purchase.

However there is little information about the impact of co-creation is the green industry.

Therefore, this investigation aims to examine if using co-creation in green products will lead to higher levels of trust and intention to purchase.

Through an online survey, our findings where that consumers had a higher level of trust as well as higher level of intention to purchase when it was said the product was developed by co-creation than when it was mentioned that the product was only developed by the company.

Previous studies had reported that perceived brand greenness causes impact on trust and intention to purchase, however, surprisingly, our results confirm that brand greenness didn't have any impact.

By understanding the outcomes of this study, companies can start using co-creation in the development of green products to foster trust and sales. Limitations and suggestions for future research are also discussed.

Sumário

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Os consumidores esperam que empresas se tornem mais ecológicas e desenvolvam produtos ecológicos. No entanto, o ceticismo em torno das suas reivindicações ambientais tem posto os consumidores reticentes em confiar e comprar produtos verdes.

Literatura mostra que a cocriação aumenta os níveis de confiança e intenção de compra dos consumidores. Indivíduos tendem a deter elevados níveis de atração por pessoas com atitudes semelhantes. Além disso, as empresas que desenvolvem cocriação são percebidas como sendo mais centradas no consumidor, causando atitudes positivas que levarão a uma maior intenção de compra.

No entanto, pouca informação existe sobre o impacto da cocriação na indústria verde.

Esta investigação pretende analisar se utilizar cocriação em produtos verdes irá aumentar os níveis de confiança e intenção de compra.

Através de um questionário online, resultados mostram que os consumidores tiveram níveis de confiança e intenção de compra mais elevados quando foi referido que o produto foi desenvolvido através de cocriação do que quando foi mencionado que o produto só foi desenvolvido pela empresa.

Estudos anteriores indicam que a perceção da marca como sendo verde causa impacto na confiança e intenção de compra, no entanto, os nossos resultados confirmam que a marca não teve qualquer impacto.

Os resultados deste estudo poderão impulsionar empresas na utilização de cocriação no desenvolvimento de produtos verdes, com o objetivo de promover confiança e vendas. Limitações e sugestões para futuras pesquisas também serão discutidas.

Preface

First I would like to thank my advisor, Cláudia Costa. Without her constant help and support I was not able to finish my dissertation. Her enthusiasm and guidance were very important throughout the process.

I would also like to thank my parents and grandparents for the support they have been giving me since I came to Lisbon to start my studies. They were always looking after me and giving me important advices for my future.

I could not forget to thank my dearest friend Joana Costa for giving me moral support and encouragement as well my hometown friends with whom I cherish a close friendship since my childhood.

Finally, I want to thank my roommates for all the good moments that we have shared. Now they are more than roommates, they are friends with whom I trust and share my thoughts.

Living in a small village in the country side and coming to Lisbon to study was a challenging experience. However, in my case, it is been the best experience of my life and I have to thank everyone that contribute and have caused an important impact in my life since I came here.

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1. Introduction

Consumers are becoming more ecologically conscious (Laroche et al 2001). In 2006, the industry for green products was projected to reach over \$200 billion (Gupta and Ogden 2009). Evidence can be found in the number of environmental activism claims, expectations of environmentally responsible packaging, new ways to deliver goods and services that reduce the carbon footprint, replacement of conventional materials with materials with lower environmental impact or recyclability of product if within the firm's current capabilities (Dangelico and Puraji, 2010).

As a result, consumers are adopting more ecological behaviors (Nielsen 2015) with over 75% considering themselves as green or to have a preference for green alternatives (Cronin et al 2011; Saad 2006). Consequently, consumers expect companies to act responsibly by protecting the environment (Nielsen 2015, Cronin et al 2011) and introducing green alternatives in their offers. However, the skepticism towards companies' green claims and the higher prices of ecological products (Sheth et al 2011; Olson 2013) have turned consumers from adopting eco-consumption patterns.

As a result, green products have less than 3% of sales within their categories (Sheth et al 2011). Low inventory turnover rates make companies neglecting green initiatives. Green products are not attractive to companies because they are expensive to produce and disappointing sales do not compensate the financial investment (Cronin et al 2011).

One of the reasons why green products are not more widely accepted is the lack of trust of consumers in companies (European Commission 2013; Cone Communication 2012).

Only 44% of American consumers trust companies' green statements (Cone Communications 2012) and in Europe, 77% would pay more for green products if eco-friendly claims could be trusted (European Commission 2013).

Trust can influence purchase decisions (Gefen and Straub 2004). By acting as a shortcut for consumer decision process, especially under high perceived uncertainty and risk in the purchase (Chaudhuri and Holbrook 2001). In these situations the capacity to understand the behavior and motivations of the other party increases the level of trust. This is why consumers tend to trust people with whom they share similar values and motivations (Morgan and Hunt 1994).

A report from Forrester shows that 70% of online US adults trust product/brand recommendation from peers, 46% trust reviews from other consumers and only 9% trust corporate or brand messages (Forrester, 2013).

One reason for the lack of trust towards companies' green statements is the *Greenwashing effect* phenomenon. Some companies have been under lawsuits because of false environmental marketing claims. This deceptive promotion of green practices has putting consumers even more unwilling to believe in green products (Forbes 2012).

Companies have been trying to overcome the *Greenwashing effect* by stimulating consumers trust. However, as Greenwash affects negatively green trust (Chen and Chang 2013), the consumer' skepticism toward green claims has been a difficult challenge to overcome. A study conducted by GfK found that more than 40% of consumers think companies green claims are deceptive (GfK 2008).

1.1 Research Aim

Co-creation, defined as a joint collaboration between company and consumers (Prahalad and Ramaswamy 2004; Humphreys et al 2009), can be a powerful tool to increase trust because it increases the dialogue between consumers and companies (Prahalad and Ramaswamy 2000). This dialogue helps building trust (Randall et al 2011). Furthermore, advertising that a product was co-created, increases the level of trust because consumers tend to trust people that are similar to them (Byrne 1969; Rempel et al 1985; Johnson and Grayson 2005; Whitemore and Dunsmore 2014). Additionally, co-creation implies full transparency. Companies need to disclose information to the market, even when it is negative information (Randall et al 2011), eliminating the potential skepticism that consumers have towards companies green products because of the *Greenwashing effect* (Forbes 2012).

The aim of this research is to evaluate co-creation as a solution to overcome the challenge that companies are having with green products. By increasing consumer's trust and increasing their intention to purchase green products, companies can start having higher inventory turnover rates and become profitable.

Co-creation has been used by several brands to foster dialogue and bonds between consumers and companies, such as the case of P&G, BMW and Adidas through online platforms. The positive impacts on trust and intention to purchase have been subject of several studies and researches (Hoyer et al 2010; Thomke and Hippel 2002; Schreier et al 2012) however scientists have not been focusing in the green industry. This study can stimulate further research in this type of industry and help managers extract the potential of this type of products, since it is proved that people are motivated in adopting green practices (Nielsen 2015).

This study will analyze and compare consumer's levels of trust and intention to purchase between a green product that was developed through co-creation against one that was fully developed by a company. This research will have also a moderator. It is proved when consumers do not have enough information available to overcome high-risk situations, they rely on signals (Atkinson and Rosenthal 2014). Brand reputation is a powerful signal given by companies (Fombrun and Shanley 1990). When consumers perceived the brand as being green they will perceived the brand as being credible in environmental performance (Chen 2010) as well as offering goods that are trustworthy and honest (Singh et al 2012).

Having the previous in mind, brand reputation for greenness will be the moderator of our study.

This research is exploratory because, to our knowledge, no study ever investigated if implementing co-creation on green products will increase consumer's trust and intention to purchase.

1.2 Research questions

As above mentioned there is a need to address possible solutions to put consumers adhering to green products. Subsequently, the research objective of this thesis is finding out if co-creation could be the answer.

The following questions have to be answer in order to reach the research objective:

Will co-created green products be more accepted by consumers?

- Are consumers more willing to purchase co-created green products?
- By adopting co-creation are green products perceived as more trustworthy?
- Is co-creation on green products a strategy to be implemented by brands that have a low perceived reputation for greenness?

1.3 Conceptual Framework

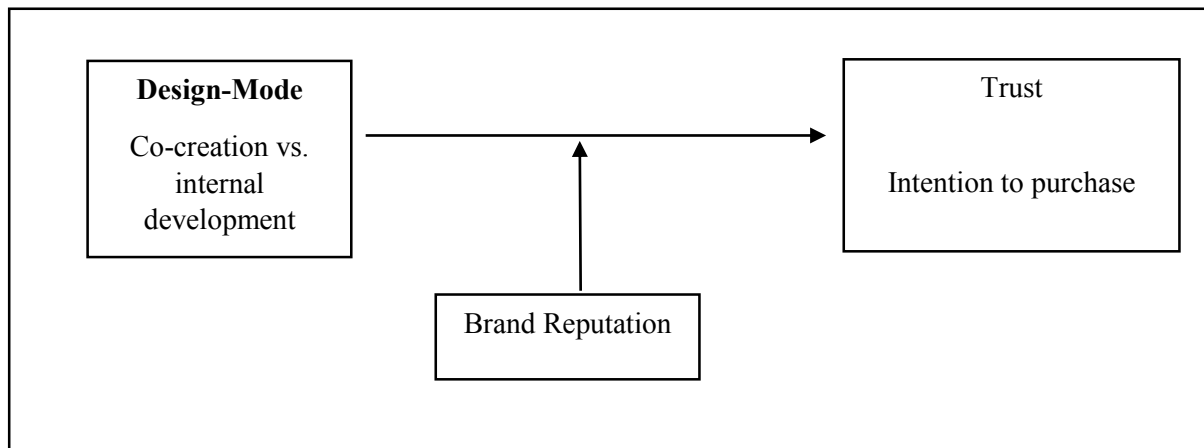


Figure 1. Conceptual Framework

2. Literature Review

2.1 Trust

Morgan and Hunt (1994) define trust as the “key theoretical building block in relational exchange”. Trust is a mental state that depends on an exchange partner with whom the subject has confidence (Moorman et al 1993) and shares empathy and similarity with (Rempel et al 1985). In social relationships, individuals tend to have higher levels of attraction towards people with similar attitudes. This perceived self-similarity provides the development of trust (Byrne 1969; Johnson and Grayson 2005; Whitmore and Dunsmore 2014). In previous experiments individuals reported higher levels of trust for people they perceived as being more alike (LaPrelle, J. et al 1991; Laursen & Hartrup 2002; Simpson 2007).

Trust occurs in situations that is hard to observe the intentions of the other party (Simpson 2007) and it is particularly important when there is not sufficient information to make choices with confidence (Morgan and Hunt 1994).

According to the commitment-trust theory of relationship marketing, to overcome this high-risk situation, relationships must be regarded by trust and commitment. In this theory, shared values are the antecedents of trust. The perception of shared values increase the perceived capacity to guess other’s motivations and behavior and, therefore, increase trust (Morgan and Hunt 1994). More evident the shared values are, the higher is the level of trust (Sekhon et al. 2014).

Having that in mind, consumers are more willing to trust other consumers because they share the same motivations and behaviors and because they are, as well, more similar to them than companies. The Nielsen Global Trust in Advertising Report (2014) pointed out that 83% of online respondents from 60 different countries said they trust recommendations of friends and family, being the most credible source of advertising (Nielsen 2014).

2.1.1. Co-creation and the effect on trust

Co-creation is a joint collaboration and creation of value between consumers and companies (Prahalad and Ramaswamy 2004; Humphreys et al 2009). In this new approach of value creation, consumers actively contribute to the new product development (NPD) by selecting various elements of the new product. With co-creation, companies encourage consumers to become more active by boosting dialogues, managing consumer communities and foster consumers interactions with the company (Prahalad and Ramaswamy 2000).

Several companies have been using co-creation to develop those interactions. P&G created an online platform called P&G connect + develop where the company shares their innovation needs and ask consumers for innovative solutions that can address the problem (Appendix 1). Adidas developed an online community for consumers that want to deeply connect with Adidas. In “Adidas Insiders” consumers can provide feedback and give ideas for new products and campaigns. Other example is the Co-creation Lab of BMW Group. In this virtual meeting place, people interested in cars can share their ideas and opinions about the automotive world.

In those examples, companies are engaging with just some consumers – the participating consumers. Previous research has been focusing in those consumers however the observing participants (the ones that do not participate in co-creation) are more important to companies because they constitute the majority of the market (Fuchs et al 2013). Co-creation affects differently consumers that participate from consumers that do not participate. Nevertheless, when the market knows that a company involves consumers in their development process, the evaluation of the company/brand might change (Fuchs and Schreier 2011) because consumers will view the company/brand as being more consumer-centric (Van Belleghem and De Ruyck 2012).

Co-creation helps building trust through this dialogue between companies and consumers (Randall et al 2011). The company, the participating consumers and the community of observing consumers, through dialogue, create bonds and share risk among themselves. Furthermore, in order to start using co-creation in the development process, companies need to become more transparent even when they need to disclose negative information about their products (Randall et al 2011). Traditionally, companies used to have benefits when they chose not to disclose information to consumers but nowadays, it is required and desirable that companies become more transparent (Prahalad and Ramaswamy 2004).

Having in mind that shared values and self-similarity increase levels of trust as well as the fact that companies become more transparent when they start using co-creation, by disclosing more information about their products, the following hypothesis was developed:

H_{1a}: Consumers will trust more co-created green products than green products developed entirely by companies.

2.2 Intention to purchase

Intention to purchase is a planned behavior (Ajzen 1991) that occurs when a consumer decides for a specific product by disregarding the others (Porter 2009).

Fishbein (1975) suggests that attitudes towards purchasing an object will usually lead to the behavior in question. Companies use intention to purchase as an evaluator for new product concepts. They claim that it can measure and predict the actual purchases (Douglas and Wind 1971).

Consumers' purchasing decision is very complex and it is related with consumers' behavior, perception and their attitude. Positive attitudes might affect consumers purchase intentions (Hoyer et al 2010; Thomke and Hippel 2002).

2.2.1 Co-creation and the effect on intention to purchase

As previous mentioned, when companies use and advertise that they developed new products through co-creation, not only consumers perceive companies has more consumer-orientated but also co-created products as being more desirable (Fuchs and Schreier 2011). Consumers have a closer knowledge about their preferences and needs (Poetz and Schreier 2012) and this can potentially increase the fit between consumer's need and product benefits (Alam 2002) increasing the level of intention to purchase.

Consumers have more positive attitudes towards co-created products (Brodie et al 2013) and positive intentions towards products that empower users (Fuchs and Schreier 2011). Meaning that

attitudes and behavioral intentions of consumers are stronger for companies that utilize co-creation in new product development (Fuch and Scheier 2011). As mentioned above, attitudes are the basis of consumer behavior (Hoyer et al 2010) boosting the intention to purchase when those attitudes are positive (Hoyer et al 2010; Thomke and Hippel 2002).

Furthermore, it is been proved that consumers' intentions to purchase products is higher in co-created products when compared with products entirely developed by companies (Schreier et al 2012).

H_{1b}: Co-created green products will lead to a higher intention to purchase than the product entirely developed by companies.

2.3 The impact of brand reputation for greenness on trust and intention to purchase

According to information asymmetry theory, individuals use disclosed information to make decisions. Information asymmetry occurs when some information is only available to some individuals, putting people knowing different things. The information asymmetry is particular important when an individual is concern about the behavior or intentions of the other partner (Connelly et al 2011; Elitzur and Gavious 2003). Normally consumers rely on signals (an informational and extrinsic cue), in particular moments of uncertainty. With those signals, consumers form interpretations about the product in question (Bloom and Reve 1990).

Companies can introduce signals through advertising (Kirmani 1990) being a very powerful tool that can increase perceived quality of the product. However some products attributes are difficult to assess through information (Atkinson and Rosenthal 2014). Nelson (1974) shows this situation with an example of a can of tuna. Consumers can easily verify claims about the cost and the quality of the tuna by checking the price and consuming it (respectively) however they cannot apprehend if the number of dolphin facilities were minimize during the fishing of that tuna by just looking at the "dolphin safe" label. In this particular moments of uncertainty, consumers have the power to trust or not trust in those signals (Atkinson and Rosenthal 2014). That is why companies use their

brands to inform consumers about the credibility of their product's claims (Erdem and Swait 1998). Being brand reputation towards greenness important in this situation.

Brand reputation is how a brand is perceived by others and it is a signal that helps consumers making comparisons between company's own products and products available in the market (Fombrun and Shanley 1990).

Companies with good reputations have higher source of credibility (Du et al 2010) while companies that have low reputation may experience the opposite (Yoon et al 2006).

The brand reputation for being green has a positive influence on trust because it will reduce the perceived risk (Chen 2010). Consumers believe the brand is honest, responsible and competent and this will increase their levels of trust (Doney and Cannon 1997). The greener the brand the higher the perception of the brand being credible on environmental performance (Chen 2010).

When a brand is perceived as green it is as well perceived as offering goods that are trustworthy and honest (Singh et al 2012).

H_{2a}: The effect of co-created green products on trust is stronger for brands perceived as green than for brands not perceived as green.

Brands that establish a green reputation among consumers have the opportunity to grow market share (Nielsen 2015). Since, with the signals send by companies, consumers form interpretations about the product in question (Bloom and Reve 1990) and those will act like a consumer's shortcut in the purchase decision (Chaudhuri and Holdbrook 2001). By communicating the unobservable qualities of their products, companies are simplifying the purchase decision process (Frombrun and Riel 2004).

According with the Nielsen Global Survey of Corporate Social Responsibility (2015), the most important purchase driver for sustainable products is the brand (62%) (Appendix 2).

H_{2b}: The effect of co-created green products on intention to purchase is stronger for brands perceived as green than for brands not perceived as green.

3. Research Methodology

3.1 Data collection and Sampling

This investigation requires a sample coming from a general population. The objective is to know if consumers, in general, will accept co-created green products and if companies can start applying this to overcome the lack trust and sales they are having with this type of products.

As this study is constrain by budget and time, it was conducted a web survey to collect consumer's responses. Web surveys have advantages such as direct access, cost minimization, quick collection of information, easy download of results and it also eliminates geographic barriers as it will allow us to reach people from different parts of the world (Evans and Marthur 2005).

Besides time, geographic and financial advantages, it also provides better results than personal or telephone interviews because it will reduce the bias of the interviewer as well as social desirability and courtesy bias results (Bronner and Ton 2007).

On the other hand, this quantitative research procedure has attached some disadvantages that can cause limitations in the study. The response rate is lower than in the personal interviews and it can cause bias results because it won't cover people that do not use internet. The sample cannot be fully representative of the population (Grandolas et al 2003).

After considered the pros and cons of web surveys, we selected this method to collect the data.

Between 23rd of April and 2nd of May 2016, 178 participants conducted an online survey.

Participants were randomly selected in the researcher's own network by sharing the survey's link through email and Facebook. After the data check, 40 responses were considered invalid because they had missing values or outliers that would jeopardize results and, therefore, were deleted from the sample. Having that in mind, the study complied 138 valid responses.

Table 1 will show details about the participants in study.

Variable	Category	Frequency	Percentage
Sex	Male	48	34.8
	Female	90	65.2
Age	0 – 21	17	12.3
	22 – 36	97	70.3
	37 – 51	13	9.4
	52 – 71	11	8.0
Household income (€/year)	< 10,000	48	34.8
	10,001 - 20,000	35	25.4
	20,001 - 30,000	16	11.6
	30,001 - 40,000	14	10.1
	40,001 - 50,000	9	6.5
	50,001 – 60,000	5	3.6
	>60,000	11	8.0
Nationality	Portuguese	109	79.0
	Other	29	21.0
Profession	Student	79	57.2
	Employed	52	37.7
	Between jobs	5	3.6
	Unemployed	1	0.7
	Retired	1	0.7

Table 1. Demographics of the sample in study

The sample consisted of people with different demographics. As it is presented in the table above, the majority of the participants are Portuguese (79%) and women (65.2%).

More than 70% of the participants belong to the Millennial's generation (people between 22 and 36 years old). In terms of the occupation, 57.2% of respondents are students and 37.7% are employed. Regarding the household income, 34.8% of participants responded that is less than €10,000 per year and 8% responded that is more than €60,000 per year.

3.2 Procedure

As the literature review specified, not only trust is influenced by the design-mode (i.e. product developed by co-creation/internally by the company) but it is also influenced by brand green reputation i.e. by the way consumers perceived the brand as being more or less green.

In order to test that reality, it was designed an online survey using *Qualtrics*, clustered in four different scenarios, which were randomly and equally distributed among participants by using the randomizer option available in the program. This allows us to have equal number of responses for each scenario.

It has a 2x2 between subjects design, randomly assign as following:

		Brand with Green Reputation	
		Yes	No
Design-Mode	Co-creation	Scenario 1	Scenario 2
	Developed internally by company	Scenario 3	Scenario 4

Table 2. Research Conditions

In order to choose the product to be presented in the main study, a pilot study was conducted. In total 35 participants answered this short online survey developed in *Qualtrics* that was randomly distributed through the researcher’s own private network. The sample consisted in 78% of women, 83% Portuguese and 59% with ages between 22 and 36 years old (Millennials). The participants were introduced with a brief description of co-creation and then asked to choose, between three products, the one that they thought it would be more credible to be co-created (Appendix 3). The products in test were cosmetics, household cleaning products and ice-cream. It was chosen these type of products because they are associated with environmental concerns or scandals such as air and water pollution, animal cruelty/exploration or inorganic materials and because, in these three categories, some brands distinguish from the others by having a green and ecological approach clearly stated in their mission, vision and strategy.

The product that was chosen to be part of the main study was the one with the higher percentage of responses.

Product	Responses	%
Ice-cream	7	20%
Household Cleaning Product	15	42.9%
Cosmetics	13	37.1%

Table 3. Pilot Study results

Participants were as well presented with five different brands for each product and asked to classify, in a 7 point Likert scale, the perceived greenness of the brand by adapting the scale developed by Gershoff and Frels (2015):

Variable	Items	Alfa
Perceptions of brand greenness (Adapted scale from Gershoff and Frels, 2015)	This brand deserves to be labeled as ‘Environmentally Friendly’	0.96
	Purchasing this brand is a good environmental choice	
	A person who cares about the environment would be likely to buy this brand	
	How ‘environmentally friendly’ or ‘green’ is this brand?	

Table 4. Perception of greenness scale

As it was household cleaning products the product with the higher percentage, we analyzed the averages of the brands for this product. However, the results were inconclusive. When analyzing the descriptive statistics, averages were found to be similar between the five brands of cleaning products. It was decided not to select Mr. Muscle and Dettol brands for the main study (brand with the lowest mean and the brand with the highest mean) nor testing if the mean differences between them were statistically significant, since the difference in means between the two were not that noticeable.

Brands	Mean	Std. Deviation
Cif	3.6	1.29
Tide	3.63	1.3
Mr.Muscle	3.3	1.1
Dettol	3.87	1.29
Ajax	3.52	1.32
Global Average	3.58	

Table 5. Pilot Study descriptive results

Having in mind that the pilot study did not provide the two brands for the main study, the criteria used for the selection of those was:

- Ingredients used in the brand's products;
- Company' strategy;
- Name and logo of the brand.

Mr. Muscle was one of the brands chosen. This brand, manufactured by S. C. Johnson & Son, is known for offering efficient and reliable cleaning solutions and it uses mainly chemical ingredients such as decanoic acid. Their communication focuses in scientific answers to severe cleaning household problems and they do not apply green marketing in their strategy. The brand's logo is a cartoon of a muscly scientist man dressed in an orange superhero costume.



Figure 2. Mr. Muscle Logo

The other brand chosen for the study was Frosch. Frosch is a German brand available in biological/organic stores that focuses on environmental benefits. They use raw materials that are biodegradable. They apply green marketing as their core strategy. Their communication focuses on environmental causes and in the green benefits of their products. The brand's logo is a cartoon of a smiley green frog.



Figure 3. Frosch Logo

3.2.1 Online Survey

The survey was written in a way that would re-create a consumer journey, starting with the consumer going to the supermarket up to the actual intention to purchase the product.

First, all participants were asked to imagine they were at the supermarket in the household cleaning product aisle. Then, they were presented with one of the two brand's logo with a small description of the brand. This information was written based on the statements found in their institutional webpages.



Mr. Muscle is a brand specialized in cleaning household solutions which are divide by stains or surfaces.

The ingredients used are mainly Aqua, Sodium hydroxide, Decanoic acid, sodium salt between other chemical elements.

Our mission is to put strength and intelligence within our cleaning solutions/products.



Frosch is a brand that offers household cleaning products.

Our cleaning products' solutions are the result of a mix between natural ingredients and household remedies like vinegar, lemon and soda.

The ingredients used are mainly plant-derived and biodegradable.

Our main goal is to ensure that sustainable, green and innovative solutions become valid by society.

After the brand's description, participants answered three questions regarding brand awareness, brand evaluation and perceived greenness. The aim of the questions about perceived greenness is to assess if consumer's perceptions match the reputation the brand wants to pass to the market. Brand evaluation and brand awareness will be used as control variables in our study.

Participants were given information about a new range of green cleaning products created by the brand in question. The information about the green cleaning products was the same for both scenarios, the only difference was the description of the method used to develop the new range of products: co-creation or internally developed by the company.

Because co-creation is a common concept not used in everyday life communication, we illustrated the concept by referring to the strategy of co-creation implemented by BMW and then adapted to the green cleaning products.

Co-creation Scenario

“[Frosch/Mr.Muscle] is going to launch a new range of cleaning products. To do so, [Frosch/Mr.Muscle] created a virtual meeting place for customers with interest in environmental concerns and sustainable environmental practices.

Here customers could vote, give feedback, present ideas and share their opinions about the current offer of household cleaning products.

In a very collaborative environment, [Frosch/Mr.Muscle] and customers created a new range of bio cleaning products made with ingredients from green vegetables, seeds, plants and filtered sea water. Because it doesn't contain the normal bleach, ammonia nor hydrofluoric acid, it doesn't harm the environment. They are also vegan because they weren't tested on animals and are 100% plant derived.”

Internally Developed Scenario

“[Frosch/Mr.Muscle] is going to launch a new range of bio cleaning products made with ingredients from green vegetables, seeds, plants and filtered sea water. Because it doesn't contain the normal bleach, ammonia nor hydrofluoric acid it doesn't harm the environment. They are as well vegan because they weren't tested on animals and are 100% plant derived.”

Participants were then shown a picture of a cleaning product labelled with ecological elements such as vegan and free animal cruelty as well the indication that the ingredients used are plant based.



Figure 4. Manipulated image of “Earth Cleaning Products” detergent

All scenarios saw the same picture with the exception of the description, which changed with the method in test: co-creation or internally developed.

<p>Co-created scenario</p> <p>“This detergent is the result of the collaboration between [Frosch/Mr.Muscle] professionals and environmentally concern consumers.”</p> <p>Internally Developed scenario</p> <p>“This detergent is the result of creation and production of [Frosch/Mr.Muscle] professionals.”</p>
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Then participants were asked to rate five statements according with their perceptions of product’s environmental benefits. This scale, developed by Chen (2013), will measure consumer’s green trust in terms of the product in study.

In the end, all participants were subjected to the same hypothetical scenario [“Imagine that you are running low on detergent and you need to purchase it.”] and then asked their intention to purchase the product in question by using the scale developed by Mohr and Webb (2005).

To finalize the survey, some demographics were asked such as age, gender, nationality profession and household income.

The table below shows how many people were allocated to the different scenarios.

Scenario	Frequency	Percentage
Frosch : co-creation	32	23.2
Frosch : developed internally	38	27.5
Mr.Muscle : co-creation	32	23.2
Mr.Muscle : developed internally	36	26.1

Table 6. Distribution of participants in each scenario

3.3 Measures

The table below shows the constructs used in the survey as well as the source and items of each one of the constructs.

Constructs	Source	Items
Brand Awareness	Thompson & Malaviya (2013)	How familiar are you with the [Brand] brand? [1] not at all familiar... [7] very familiar
Brand Evaluation	Adapted from Swaminathan et al (2015)	In your opinion Mr. Muscle brand is/has... 1-Low/High quality; 2- Bad/Good; 3- Negative/Positive
Eco-friendly perception (Manipulation Check)	Own construct	Please classify [Brand] in terms of perceived eco-friendliness: [1] Very eco-destructive ... [7] Very eco-friendly
Design-Mode (Manipulation check)	Own construct	Who developed the product? [1] Consumer only [4] Consumer and Company [7] Company only
Design-Mode Confidence	Adapted from Klink and Athaide (2010)	1. How confident are you that [company's creation/joint creation between consumers and company] can provide a satisfactory household cleaning product? [1] Not at all ... [7] Very confident 2. How sure are you that [company's creation/joint creation between consumers and company] could meet your standards for a household cleaning product? [1] Not at all sure ... [7] Very sure
		Please classify the following statements according with your perception:

Green Trust	Chen (2013)	1-I feel that this product's environmental functions are generally reliable; 2-I feel that this product's environmental performance is generally dependable; 3-This product's environmental argument is generally trustworthy; 4-This product's environmental concern meets my expectations; 5-This product keeps promises and commitments for environmental protection.
Intention to purchase	Mohr and Webb (2005)	How likely would you buy the previous detergent? 1.Very unlikely/likely; 2.Impossible/Very Possible; 3.No Chance/Certain
Demographics	Own construct	Gender, Age, Nationality, Profession, Income

Table 7. Measures and respective scales

The most common way to measure attitudes, intentions, perceptions is through attitudes scales (Robinson et al., 1991; Brehm et al. 2005). Being the most popular the Likert Scale (Brehm et al. 2005). Having that in mind, participants were asked to specify on a seven point scale how strongly they disagree or agree with each fact.

Furthermore, this was the scale used in the previous literature, being credible to use it in the study.

3.4 Manipulation Check

In order to analyze if the participants correctly identified the different scenarios in terms of design-mode (co-creation vs. internal development) after the product had been presented with the small description, above mentioned, it was asked participants who they thought had developed the product in study, by rating in a scale 1 to 7 (being [1] consumers only, [4] consumers and company and [7] company only). The same was done for the perceived brand greenness. In order to test if consumers identified correctly the green brand and the non-green brand, participants were asked to classify it in terms of eco-friendly attitude, in a 7 point-scale with “very eco-destructive” and “very eco-friendly” as anchors.

As previous mentioned, the sample was randomly distributed between the four different scenarios, meaning that we have four different samples to compare the means of the variables. If we had only two samples we could use the t-test to compare the means but, in this case, the ANOVA is the best test to examine the means (Field 2005).

In order to test the design-mode manipulation, we performed an ANOVA Univariate on “Design-Mode” as dependent variable and the dummy variable “How the product was developed” (0=Co-creation; 1= Company) as the factor.

After running the ANOVA test, it is possible to conclude that there is a statistically significant difference between the mean for all of our conditions ($F(1,138)=7.925$; $p=0.00$) in terms of the design-mode. We can proceed with the analysis of the means.

Design-Mode	N	Mean	Standard Deviation
Co-creation	64	4.30	0.849
Internally Developed	74	4.86	1.408
Total	138	4.60	1.212

Table 8. Descriptive statistics for design-mode manipulation check

Participants perceived differences in terms of the design-mode of the product in study. Co-creation has a lower mean ($M_{\text{co-creation}} = 4.30$) when comparing with internally developed average ($M_{\text{internally developed}} = 4.86$). However, it is as well important to evaluate the standard deviations. In this case, the internally development design-mode has a higher standard deviation when comparing with co-

creation. This means that the dispersion of participants' responses is bigger, people had different perceptions about who developed the product in study.

The same was done for the question regarding the manipulation check for the green brand reputation. To do so, it was as well performed an ANOVA Univariate on "Eco-friendly perception" as dependent variable and the dummy variable "Name of the Brand" (0=Frosch; 1= Mr.Muscle) as the factor.

It was found as well that there is a statistically significant difference between the mean for all of our conditions ($F(1, 138) = 122.740; p = 0.00$). We can proceed with the analysis of the means.

Brand	N	Mean	Standard Deviation
Frosch	70	5.60	1.408
Mr.Muscle	68	3.04	1.298
Total	138	4.34	1.862

Table 9. Descriptive statistics for green brand reputation manipulation check

Participants clearly perceived differences in terms of brand's greenness. Frosch was considered as being greener ($M_{\text{Frosch}} = 5.62$) when comparing with Mr. Muscle ($M_{\text{Mr.Muscle}} = 3.04$). The standard deviations are similar between the two brands so, this is not a situation that we need to worry in our analysis.

ANOVA tells us if the overall experimental manipulation was successful and in our case it was. As illustrated in the following graph, the participants correctly identified the different scenarios and we can pursue our study.

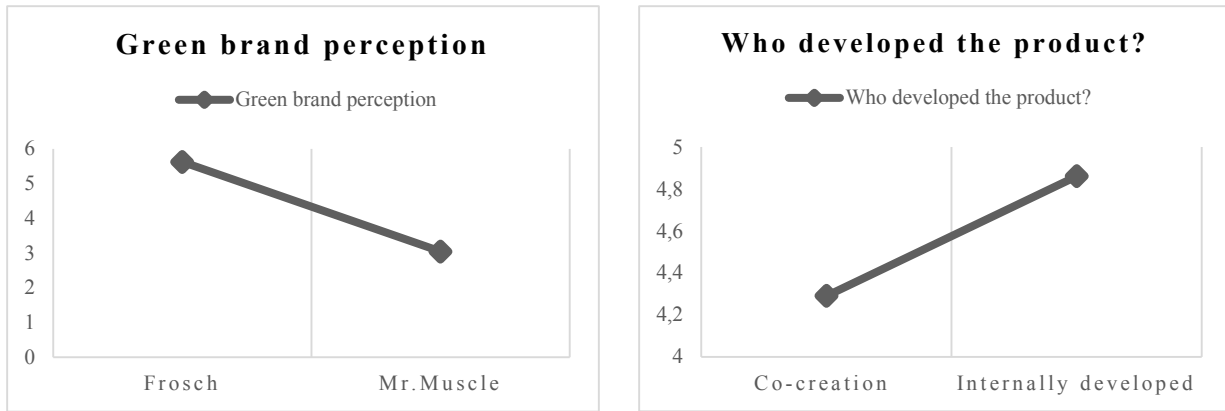


Figure 5. Manipulation checks

3.5 Reliability analysis

When multiple Likert scale questions are presented in a survey, it is essential to determine if the scale is reliable or not. Cronbach's Alpha is the common measure of reliability (i.e. internal consistency) (Field 2005).

Analysis of reliability (Cronbach's Alpha) shows that the constructs are above 0.700, this means the internal reliability is appropriate. None of the four constructs' items were deleted. The items for each construct are summarize in table 7. The Cronbach's Alphas for each construct are presented in the table below.

Constructs	Items	Factors	Alpha (α)
Brand Evaluation	Low Quality : High Quality	0.818	0.911
	Bad : Good	0.819	
	Negative : Positive	0.829	
Confidence	Not at all confident : Very confident	0.731	
Design-Mode	Not at all sure : Very sure	0.731	0.845
Green Trust	Reliability	0.830	0.919
	Dependability	0.811	
	Trustworthiness	0.847	

	Meets expectations	0.722	
	Commitment for environmental protection	0.745	
Intention to purchase	Unlikely : Very Likely	0.834	
	Impossible :Very Possible	0.835	0.926
	No chance : Certain	0.885	

Table 10. Reliability Analysis

After the reliability analysis, it was created four new variables with the means of the items that belonged to the construct in question: brand evaluation, design-mode confidence, green trust and intention to purchase.

3.6 Results

In terms of brand familiarity, Mr.Muscle was more familiar to participants than Frosch, however both brands have low levels of familiarity: $M_{\text{Frosch}} = 2.37$, $M_{\text{Mr.Muscle}} = 3.06$ ($F(1, 138) = 4.295$, $p < 0.05$) and in terms of brand evaluation, it was not possible to reject that the means of the two groups are similar since the ANOVA's result is not statistically significant $F(1,138) = 1.147$, $p > 0.05$):

Variable	Brand	
	Mr.Muscle	Frosch
Brand Familiarity	2.37	3.06

Table 11. Brand Familiarity

The same applies for the design-mode confidence. The ANOVA's result was not statistically significant $F(1, 136) = 3.409$; $p > 0.05$). We cannot reject that the means of the co-creation and internally development groups are similar for the design-mode confidence.

3.6.1 Hypothesis testing

H_{1a}: Consumers will trust more co-created green products than green products developed entirely by companies.

In order to understand if there is an effect on green trust based on the design-mode of the product (co-creation vs. internal development) i.e. if there are significant differences between the means of the two independent groups (participants with co-created scenarios against participants with internally developed scenarios) we run an ANOVA in SPSS statistics.

The assumption of normality for green trust scores was satisfied for both groups by assessing Shapiro-Wilk's test ($p < 0.05$). A Levene's test was as well conducted to test the homogeneity of variances. The study shows that there is statistically significant differences among the variances. However, it is possible to pursue the analysis by doing a Welch ANOVA - Robust Tests of Equality of Means (Field 2005).

The Welch ANOVA was conducted for the dependent variable "green trust" in the factor "how the product was developed".

Welch	Statistic	P-Value
Green Trust	6.820	0.010

Table 12. Welch ANOVA's results for green trust on design-mode

Results are statistically significant. P-value is 0.01 (< 0.05) so, it is possible to reject the null hypothesis (that the means of the two groups are similar) and proceed with the analysis:

Design-Mode	Mean	Standard Deviation
Co-creation	5.42	0.59
Internally Developed	4.99	1.17

Table 13. Means and Standard Deviation for green trust on design-mode

Analyzing now the means for green trust in the two groups, co-creation had a higher mean ($M_{\text{co-creation}} = 5.42$) than the internally developed group ($M_{\text{internally developed}} = 4.99$). In terms of standard deviation (SD): $SD_{\text{internally developed}} = 1.17$ and $SD_{\text{co-creation}} = 0.59$.

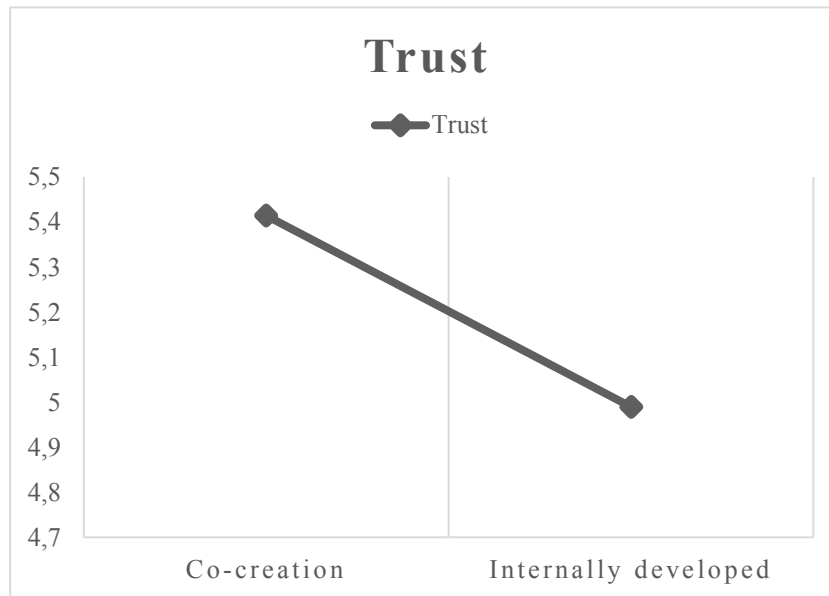


Figure 6. Mean results for Green Trust on design-mode

H_{1a} is supported. Co-created green products will have a higher green trust than the products entirely developed by firms.

Our second hypothesis in study was:

H_{1b}: Co-created green products will lead to a higher intention to purchase than the product entirely developed by companies.

Basically we need to apply the same study in the H_{1a} but with the difference in the dependent variable. Now our dependent variable is “intention to purchase”.

Shapiro Wilk’s test affirms that there is normality in both groups ($p < 0.05$). Furthermore, Levene’s test was statistically significant ($p < 0.05$). Because we reject the equality of variances, we will use Welch ANOVA for the analysis.

The Welch ANOVA was conducted for the dependent variable “intention to purchase” on the factor “how the product was developed”:

Welch	Statistic	P-Value
Intention to purchase	5.099	0.026

Table 14. Welch ANOVA’s results for intention to purchase on design-mode

Results are statistically significant. P-value is 0.026 (< 0.05) so, it is possible to reject the null hypothesis (that the means of the two groups are similar) and proceed with the analysis.

Design-Mode	Mean	Standard Deviation
Co-creation	5.08	1.09
Internally Developed	4.58	1.51

Table 15. Means and Standard Deviation for intention to purchase on design-mode

Analyzing now the means of the two groups, co-creation had a higher mean ($M_{\text{co-creation}} = 5.08$) than the developed internally group ($M_{\text{internally developed}} = 4.58$). In terms of standard deviation (SD): $SD_{\text{internally developed}} = 1.51$ and $SD_{\text{co-creation}} = 1.09$.

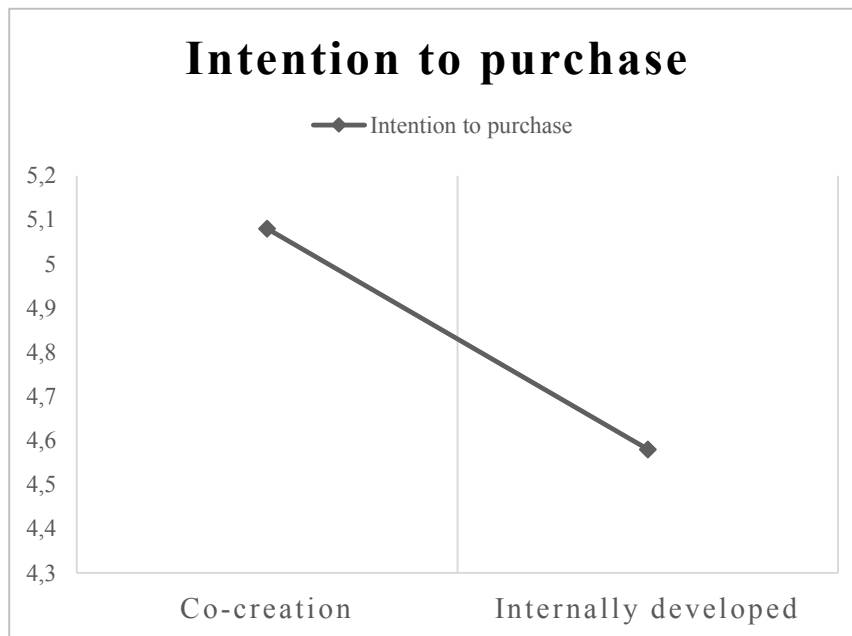


Figure 7. Mean results for intention to purchase on design-mode

H_{1b} is supported. Co-created green products will lead to a higher intention to purchase than the products entirely developed by firms.

Our third hypothesis is:

H_{2a}: The effect of co-created green products on trust is stronger for brands perceived as green than for brands not perceived as green.

Now we are just interested in the effect of the brand on green trust, for the groups with the co-created scenario only.

To do that, we need to select from our sample only the cases with co-created scenarios and compare the means of the groups Frosch and Mr.Muscle.

Testing for the Shapiro-Wilk's, the normality assumption was not satisfied for the Mr. Muscle group (Shapiro-Wilk's test had a p-value above 0.05).

However, it is affirmed that several test are “robust” to the normality assumption such as the ANOVA. This means that even though they require normality assumption, they should also work well for non-normal data (Field 2005).

Testing now the Levene’s test for the equality of variances, there is homogeneity of variances ($p=0.119 > 0.05$). We can pursue our study.

Running the ANOVA with the dependent variable “Green Trust” on brand, results showed that we cannot reject that the groups have identical means, since the p-value is 0.292 ($F(1,64) = 1.219$).

ANOVA	Statistic	P-Value
Trust	1.219	0.272

Table 16. ANOVA’s results for trust on brand (in co-created scenarios)

Since we cannot reject the null hypothesis, we cannot pursuit with the analysis of the means presented in the table below.

Brand	Mean	Standard Deviation
Frosch	5.33	0.65
Mr. Muscle	5.49	0.52

Table 17. Means and Standard Deviation for trust on brand (in co-created scenarios)

H_{2a} is not supported. We cannot support that the effect of trust in co-created green products is stronger for brands perceived as green than for brands not perceived as green.

Our final hypothesis in study is:

H_{2b}: The effect of co-created green products on intention to purchase is stronger for brands perceived as green than for brands not perceived as green.

To evaluate the last hypothesis, we analyzed the co-created scenarios like in the previous hypothesis.

The normality assumption was not satisfied for the Mr. Muscle group (Shapiro-Wilk's test had a p-value above 0.05). However, as previous mentioned, it is affirmed that several test are "robust" to the normality assumption such as the ANOVA (Field 2005).

Testing now the Levene's test for the equality of variances, there is homogeneity of variances ($p=0,150 > 0.05$). We can pursue our study.

Running the test with the dependent variable "intention to purchase" on "Name of the brand", results showed that we cannot reject that the groups have identical means since the result is not statistically significant ($F(1,64)=0.071$; $p = 0.791$).

ANOVA	Statistic	P-Value
Intention to purchase	0.071	0.791

Table 18. ANOVA's results for intention to purchase on brand (in co-created scenarios)

Since we cannot reject the null hypothesis, we cannot pursuit with the analysis of the means presented in the following table.

Brand	Mean	Standard Deviation
Frosch	5.05	0.83
Mr. Muscle	5.13	1.30

Table 19. Means and Standard Deviation for intention to purchase on brand (in co-created scenarios)

H_{2b} is not supported. We cannot support that the effect of co-created green products on intention to purchase is stronger for brands perceived as green than for brands not perceived as green.

3.6.2 Additional Findings

The meaning of this section is to provide an opportunity for further research in this subject.

Evidences have shown that Millennials are more concern about the environmental problems than other generations (Nielsen 2015) put them as the target group for this type of product.

However, as presented in the figure 8, when analyzing the means of the variable intention to purchase on age (in our case clustered in generations), Millennials were not the generation with the highest mean on the intention to purchase the green detergent.

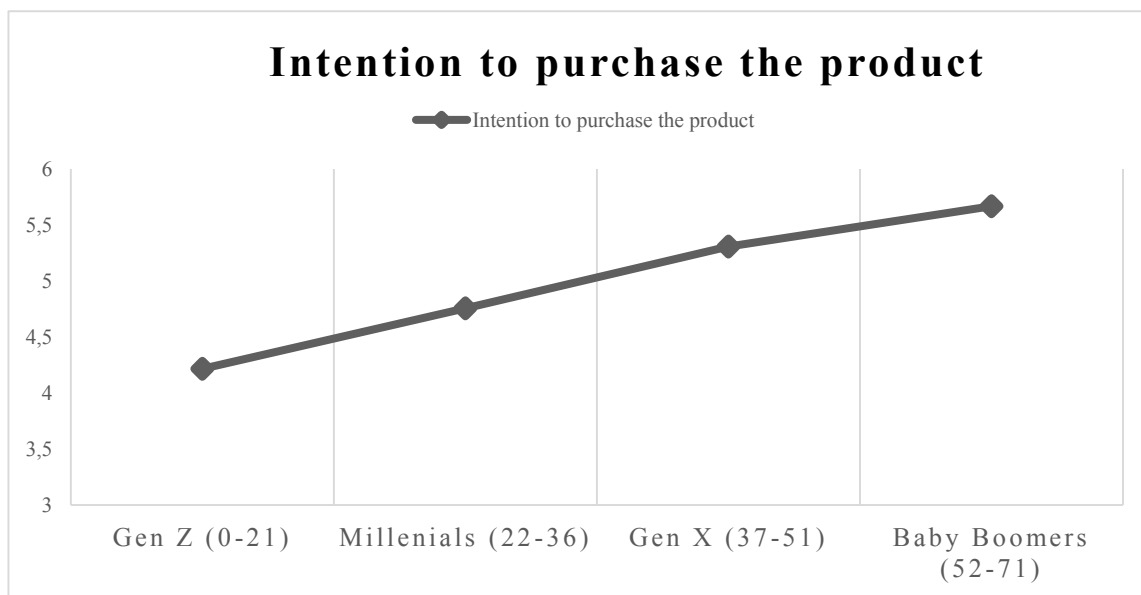


Figure 8. Mean results for intention to purchase on different generations

As illustrated above, older the generation more intent they were in purchasing the product. However psychographic parameters are not considered and the reason for this result could rely on the product itself, for not being attractive enough to this generation, and not because of being green or not. Having that in mind, further analysis should be done to understand what the real target of green products is. This way companies can advertise them better.

4. Discussion of Results and Conclusion

Our research provides important outputs about the effects of co-creation on green products when it comes to consumer trust and intention to purchase green products.

The results show that co-creation changes consumer's levels of trust and intention to purchase.

When testing for the difference in means, the test showed that the mean for green trust was higher in the co-creation group than the mean from the internally developed group. This means participants, on average, trusted more the green product when it was advertised that it was co-created with consumers with deep concern about the environment than when it was said it was a new product developed internally by company's professionals.

The same happened with intention to purchase. When testing for the difference in means, the test showed the mean for intention to purchase higher in the co-creation group than in the internally developed group. This means participants, on average, were more intent to purchase the product when it was previous said it was the result of a collaboration between the brand and consumers with environmental concerns than when it was said that was created by the company.

Against our expectations, no evidence was found that brand reputation for greenness would have an effect on trust and intention to purchase when tested for co-creation scenarios.

Brand awareness, brand familiarity and brand evaluation were presented in the study as control variables. No significant differences between brand awareness and evaluation were reported. In terms of brand familiarity differences were found between the two brands, however both brands scored low in familiarity (< 3.1 out of 7).

The aim of this thesis was to introduce co-creation as a solution to a real managerial problem that nowadays companies are facing – the lack of trust and sales in green products. The research question was consequently formulated as:

Will co-created green products be more accepted by consumers?

Next, a set of sub-questions were important to be asked in order to answer the main question with more confidence: Are consumers more willing to purchase co-created green products? By adopting

co-creation are green products perceived as more trustworthy? Is co-creation on green products a strategy to be implemented by brands that have a low perceived reputation for greenness?

After conducting this research we are able to address those question above mentioned:

- ***Are consumers more willing to purchase co-created green products?***

Yes, by adopting and mentioned that the green product was co-created with environmental concern consumers, people had, on average, a higher intention to purchase it than when it was developed only by the company.

- ***By adopting co-creation are green products perceived as more trustworthy?***

Yes, by adopting and advertising to consumers that the green product was developed by a joint collaboration between the brand and environmental concern consumers, people, on average, trusted more the environmental claims and benefits than when the product was developed entirely by the company.

- ***Is co-creation on green products a strategy to be implemented by brands that have a low perceived reputation for greenness?***

Yes, it was not found differences in the means among the two brands in question, H_{2a} and H_{2b} were not supported. Brand reputation for greenness didn't have an effect in our study.

However, it is recommended to do more research, especially with brands that are more familiar to consumers since Frosch and Mr.Muscle didn't have high means on brand familiarity and brand reputation is how a brand is perceived by consumers (Fombrun and Shanley 1990).

And finally,

Will co-created green products be more accepted by consumers?

After analyzing the three sub-questions, it is possible to say that co-created green products will be more willing to get accepted by consumers than products developed inside company's borders.

5. Managerial Implications

This study solves the problem that companies are facing with green products by providing a solution for the lack of trust and sales within this category of products – co-creation.

The lack of sales and the low inventory turnover rates put companies asking if it is a good investment to continue producing green products, since it is causing financial disadvantages (Cronin et al 2011).

However, demand for green products exists (Nielsen 2015; Cronin et al 2011; Saad 2006) and in fact the green product industry has been proved to be an attractive industry to invest in (Gupta and Ogden 2009). The problem does not rely in the product per se but on the fact that green claims are difficult to assess because the green characteristics of the product are intrinsic (Nelson 1974). Besides the fact that when people use a green product they cannot perceived an immediate impact on the environment.

That is why it is important for companies to send signals (Atkinson and Rosenthal 2014). Consumers rely on signals when they do not have enough information to make a decision with confidence (Morgan and Hunt 1994).

At this moment companies and governments use eco-labels to assure consumers the ecological quality of the product (Brécard et al 2009). However it is not enough.

The theory refers that self-similarity (Rempel et al 1985) and shared values (Morgan and Hunt 1994) are important in situations when consumers are dealing with high-risk situations.

Managers need to understand that green consumers will perceive other green consumers has someone that has the same values, motivations and behaviors (Morgan and Hunt 1994). Therefore, they will trust them more than in companies.

With that being said, managers, instead of abandon the idea of developing green products, they should open companies' borders and invite consumers, that are deeply concern with the environment, to take part of the development process of new green products.

However, it is as well important to send the signal of co-creation to the non-participants since they are the majority of the market (Fuchs et al 2013). Managers can do it by advertising that the product was made with a collaboration with consumers that strive to protect the environment.

6. Limitation and Further Research

This study has several limitations that deserve discussion. First, the size of the sample was very small. The total number of participants were 178 however just 138 completed a valid survey. Adding to that, because the survey was divided in four different scenarios, each group had about 35 responses each.

Concerning with the sample in study, 79% of participants were Portuguese and only 7 were not Europeans. This reality doesn't represent the population in general and can potentially cause bias results in the study.

Adding to that, because the participants were selected randomly we do not know if they are the proper target for the product in question. If they do not have any previous experience with the product or do not have any feelings or attachment towards this type of products it is more difficult to assess their attitudes (Miller 1998) and they could be answering without a closer knowledge or understanding, causing biased results.

Other limitation that it is worth mention, is the fact that this experiment didn't measure the level of environmental concern of participants and if the participants in study were already adopting environmental practices in their daily lives.

This study focused only in one product. To find out if the results are representative, further research is needed to be conducted for other type of products (like low/high involvement products).

The study allowed to conclude that the brands in study didn't had an effect in the dependent variables however, both scored low in familiarity. Further research should be useful to attest if there is any effect on results concerning brand familiarity by applying the study in brands with significant differences in familiarity.

Participants were subjected to a visual *stimulus* as well as a small description of the product in study, however it might not be enough for the evaluation of the product.

They can also answer without reading carefully or thinking deeply beforehand. Even if they answer truthfully they could not have the same thoughts if they were experiencing it in real life. To overcome this situation, if the study was not constrained by time and budget, a possible strategy would be an in-store experiment.

Other limitation is the fact that, in the manipulation check for the Design-Mode (co-creation vs. developed internally by company), participants still perceived the company having a higher percentage of decision in the development of the product. On the other hand, in the scenarios where it was not mentioned co-creation in any part of the survey, some people believed that the consumers had as well a share of participation in the development of the detergent since the $M_{\text{internally developed}} = 4.86$.

Finally, other limitation from the study is a statistical limitation. When we are dealing with statistical tests and we accept or refuse the null hypothesis we need to have in mind the existence of Type I and Type II Errors that can jeopardize and decimate our results and conclusions (Field 2005).

Additionally, more research needs to be conducted before managers start using co-creation in green products. For instance, the way a brand promotes its product has impact in the way people perceived the product itself (Modig 2014). Further research could be crucial to test the best strategy to advertise co-creation in green products: What information should be displayed in the advertisement? Which *stimuli* are better perceived? Is image more important than written information?

Furthermore, as it was tested the intention to purchase the product in this study, future research could be focusing on pricing. Companies spend more money to produce this type of product, how much their margin should be? How much are consumers willing to pay when they have non-green alternatives that are cheaper? What is the best pricing structure for this type of products?

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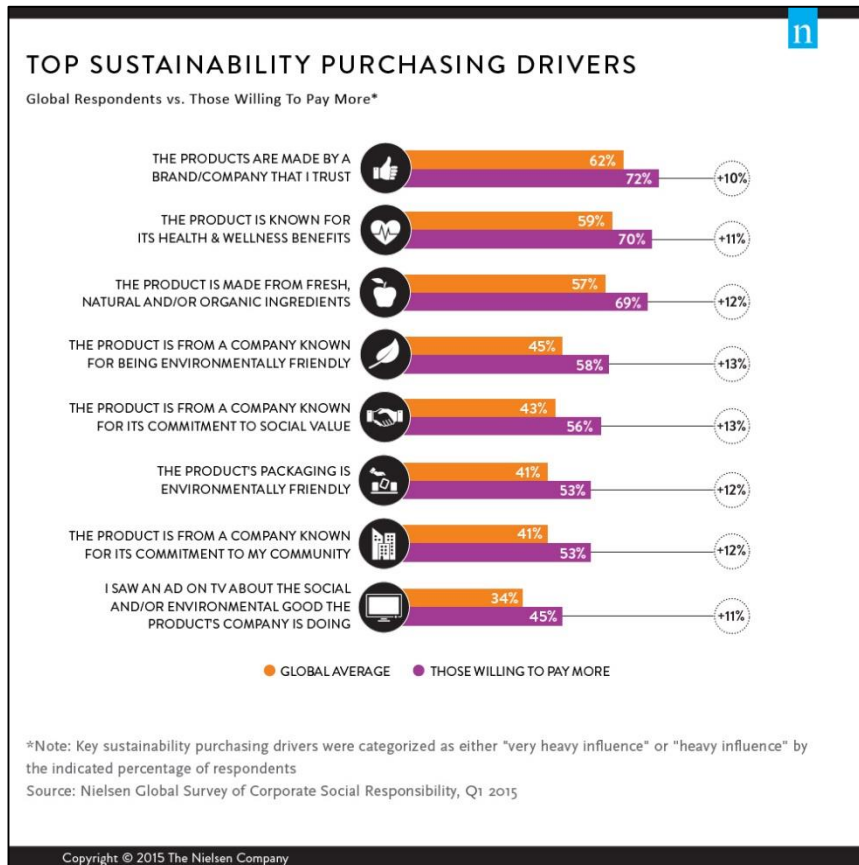
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Appendices

Appendix 1: P&G connect + development

The screenshot shows a web page titled 'Personal and Family Care Innovations' on the P&G connect development platform. The page features a navigation menu on the left with categories like 'Personal and Family Care Innovations', 'Beauty and Grooming Innovations', and 'Packaging Innovations'. The main content area highlights several innovation opportunities, including 'How to Increase Online Sales of Pampers in Central Europe', 'Vitamins Minerals Supplements', and 'Respiratory Technology'. Each opportunity includes a brief description and links to 'Read More' and 'Submit Your Innovation'.

Appendix 2: Nielsen Global Survey of Corporate Social Responsibility



Appendix 3: Pilot Study

Co-creation is a business strategy where companies and consumers work together to create products/services. Consumers are invited by companies to share ideas, co-design and/or co-produce new products/services.

In which product do you think co-creation would be more credible?

Ice-cream

Household cleaning product

Cosmetics