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TRABAJO FIN DE GRADO EN
ADMINISTRACIÓN Y DIRECCIÓN DE EMPRESAS

GREEN PRODUCTS IN THE FASHION INDUSTRY

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Abstract

The rise of green awareness due to environmental challenges has increased consumer consciousness and consumer attitudes toward green products. This study contributes to exploring consumers' perceptions and to evaluating different consumer profiles when purchasing green products in the fashion industry. Given the gap in the literature, this work on green fashion products at a consumer level will extant previous research. Having collected 153 validates responses, a cluster analysis was carried out to differentiate four segments that have divergent features, according to demographic and behavioural variables. *Antigreeners*, *Green Followers*, *Green Professionals*, and *Supergreen Women* differ in green awareness, ordered according to an increasing rate of consciousness. It has been found an overall ignorance of green products, which can be an incentive for fashion companies to tackle this lack of green awareness and position their green brands in this niche market.

Resumen

El aumento de la conciencia ecológica debido a los retos medioambientales ha incrementado la sensibilización de los consumidores y su actitud hacia los productos verdes. Este estudio contribuye a explorar las percepciones de los consumidores y a evaluar los diferentes perfiles de usuarios a la hora de comprar productos ecológicos en la industria de la moda. Dado el vacío existente en la literatura, el presente trabajo sobre los artículos de moda sostenible a nivel del consumidor ampliará investigaciones anteriores. Una vez recogidas 153 respuestas validadas, se realizó un análisis de conglomerados para diferenciar cuatro segmentos que presentan características divergentes según variables demográficas y de comportamiento. *Antigreeners*, *Green Followers*, *Green Professionals* y *Supergreen Women* se diferencian en la conciencia ecológica, ordenada en orden creciente. Se ha constatado un desconocimiento general de los productos verdes, lo que puede ser un incentivo para que las empresas de moda aborden esta falta de conciencia verde y posicionen sus marcas sostenibles en este nicho de mercado.

Keywords

Green products, fashion industry, cluster analysis, green fashion, green awareness, consumer level

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INTRODUCTION

The previous and recent industrialisation and urbanisation conclude in a rise in temperatures, sea levels, or waste, among others. In short, climate change is one of the prevalent challenges of the European Agenda. Current generations are increasingly mindful of environmental issues and their negative impact. In fact, the fashion industry is one of the most polluting sectors in the world. It is accountable for 35% of primary microplastics released into the environment, especially into the ocean (European Parliament, 2020). Furthermore, the sharp fall in prices as a consequence of the primacy of fast fashion trends entails massive textile waste in landfills. Hence, immediate action needs to be taken. Green products are an alternative solution to short life-span articles. Even though green products are found in every aspect of life, closer attention will be focused on green products in the fashion industry to tackle the aforementioned environmental matters this sector causes.

In the meantime, the growing relevance of green products and consumption has garnered eagerness from academia throughout the years (Fraccascia et al., 2018; Guo et al., 2020; Li et al., 2020; Sharma & Foropon, 2019; Tezer & Bodur, 2021; Wei et al., 2018; Yang, 2017). Deep research has been carried out to gather information on the wide diversity of green products. Broadly speaking, several of these authors discuss the concept of green products and their benefits (Fraccascia et al., 2018; Guo et al., 2020; Nath et al., 2013; Sharma & Foropon, 2019). Moreover, their impact on green consumption is also described and analysed providing general conclusions at the overall market (Hartmann & Apaolaza-Ibáñez, 2012; Lu et al., 2013; Nath et al., 2013; Yang, 2017). Nevertheless, there is no extensive literature on the behaviour at consumer-level towards the purchase of green products in the fashion industry as a whole.

The European Union is committed to transforming the fashion industry into a more sustainable and circular sector. In Europe's new agenda for sustainable growth, the European Green Deal is the pillar for achieving the promised goals. One of the principal building blocks is the Circular Economy Action Plan (CEAP) that "aims to make the European economy fit for a green future, strengthen competitiveness while protecting the environment and give new rights to consumers" (European Commission, 2021). The fashion industry is one of the most buzzing sectors in the

European Union, employing more than one million European citizens. In light of the significant role it plays in fulfilling the Sustainable Development Goals (SDGs) by 2050, especially number 13 "Climate Action", the present research will centre the attention on the consumers' attitudes towards green products in the fashion industry (European Commission, 2015). Few authors (Carvalho et al., 2020; Park, 2014) emphasise this topic. The latter addresses theoretical concepts such as circular economy, circular economy principles, green products, and green products in the fashion industry. Nevertheless, Carvalho et al. (2020) do not account for a profound study of articles in the green fashion, benefits, attitudes, challenges, and awareness. Hereafter, the main aim is to study the diverse standpoints regarding the acquisition of fashion green products at a consumer level on account of the potential niche market.

Joining this research area, this paper aims to develop consumer market segments based on their awareness and interest in the purchase of green products in the fashion industry. Finally, the green product purchasers' profiles will be examined according to demographic and behavioural variables: gender, year of birth, occupation, level of awareness of green products, fashion expenditure in a season, willingness to pay more, and increased knowledge after having concluded the questionnaire.

The present study will help to fill in the gap of research of consumer buying behaviours regarding sustainable products in the green fashion. With the understating that the fashion industry is one of the most polluting activities globally but a promising profitable sector, this analysis will encompass valuable insights for the CEAP, included in the European Green Deal.

The structure of this research is as follows. A literature review is discussed in the "Literature Review" section. In the "Methodology" section, this study describes the methodology, the data collection, the measures and descriptive statistics, and the sample. Then, the "Empirical Analysis" section addresses the software employed and the research approach. A Principal Components Analysis (PCA) and a Cluster Analysis determine the segmented groups of green products consumers in the fashion industry. The green product purchasers' profiles and cluster characteristics are shown in the "Results and Discussion" section. In the end, this study mentions the managerial implications of the findings (Section 5) and the limitations (Section 6). The research ends with the general conclusions in the "Conclusions" section.

1. LITERATURE REVIEW

1.1. Green products

The green product movement has been more dominant during the last decades due to global warming and a warning in key environmental indicators including climate change, ozone-depleting substances, air quality, waste generation, or intensity of use of water resources among others (OECD, 2008). Since environmental problems have become a global concern, the awareness of consumers increased in the early 1990s is reflected in a rise of environmental protection activities (Mclntosh, 1991). Ghazali et al. (2021) make the undisputable claim that "increasing population may negatively impact the environment, such as the depletion of natural resources, an increase in waste generation, and pollution" (p. 2). Hence, consumers are more willing to purchase goods that contribute positively to the preservation of the environment and to reinvert these hostile effects (Weiss & Chen, 2010). Society as a whole becomes more concerned with these global issues. In turn, companies need to look for business opportunities in this new market to satisfy consumers' demands for environmental products. The idea of green marketing will be conceived below, which consists of all marketing activities developed to stimulate and sustain consumers' environmentally friendly behaviours (Jain & Kaur, 2004).

The literature offers a wide range of definitions for green products. Firstly, according to Fraccascia et al. (2018), green products refer to those which are designed to reduce the negative impacts on the environment from design, manufacturing, and usage to disposal. A study carried out by the Universidade de Évora from Portugal defined several characteristics that green products fulfil. They needed to be "energy-efficient; free of hazardous substances; retrieved from renewable and sustainable resources; acquired from regional or local sources; biodegradable or have the possibility of being reused" (Carvalho et al., 2020, p. 253). In short, a green product is designed or manufactured in a manner to minimize the environmental impact involved in its manufacturing process, distribution, and consumption (Tomasin et al., 2013). The production of green products implies a decrease in the utilisation of harmful elements and non-disposable materials and components. Furthermore, they reduce the detrimental effect on human health (Yang, 2017).

1.1.1. Circular economy era

Given the rise of global pollution issues and the environmental consciousness, the concept of circular economy arises. The circular economy definition and related ideas are covered in a wide scope of the literature (Dissanayake & Weerasinghe, 2021; Geissdoerfer et al., 2017; Li et al., 2020; Ritzén & Sandström, 2017; Shen et al., 2019). It is defined as "an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes, thus operating at the micro-level, meso-level, and macro-level to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current generations and without compromising the future ones" (Kirchherr et al., 2017, pp. 234-235).

Furthermore, several policies and initiatives around the globe such as the recent new circular economy action plan (CEAP) in March 2020 are one of the main building blocks of the European Green Deal (European Commission, 2020a). The principal objective is to move from the standard concept of the linear economy to the circular economy by three strategies: useful application of materials (Recover and Recycle), extending the lifespan of products and its parts (Repurpose, Remanufacture, Refurbish, Repair and Reuse), and smarter product use and manufacture (Reduce, Rethink and Refuse).

Green products contribute to the path of the economy towards an eco-friendly and sustainable production process in which renewable resources and recycled materials. Similar to the circular economy principles, these products "allow a reduction in the energy and water used, enabling, at the same time, a reduction in the waste generated" (Carvalho et al., 2020, p. 256). It could be said that consumers have become more environmentally conscious and have adopted more sustainable behaviours in the circular economy era.

1.1.2. Green products: consumer perception

Some authors explain the consumer perception of green products using several concepts: *green brand image, green brand trust, green brand awareness, and green brand equity*. First and foremost, green brand image is defined as a buyer's psychological perspective of a brand in the customer's brain related to a contribution

(Cretu & Brodie, 2007, p. 232). Secondly, brand awareness refers to the extent to which a brand is recognized by potential consumers and is correctly associated with a particular product (Farhana, 2012). Finally, the ultimate goal of marketers is to arouse *green satisfaction* in consumers (Weiss & Chen, 2010). Tezer and Bodur (2021) found that those warm glow feelings which arise while purchasing and using green products increase the likelihood of future green purchases. Cretu and Brodie (2007) and Weiss and Chen (2010) conclude that green brand image, green satisfaction, and green trust are positively related to green brand equity. Hence, it will provide a competitive advantage since the brand will target a larger market at higher prices with higher profit margins (Jung & Sung, 2008). However, this study is carried out focusing on information and electronic products in Taiwan, as well as other studies focused on customers' cultural preferences in Malaysia (Ghazali et al., 2021) and in cosmetics brands (Yang, 2017).

All these concepts should be applied when developing green marketing strategies. Grewal and Levy (2008) defined green marketing as a tactical exertion imposed by companies to furnish clients with green products to fulfil request needs and to make a commitment to overcome ecological difficulties. It is relevant to indicate that the findings may only apply to green marketing in the cosmetics or beauty markets. Nevertheless, there is a mainstream that negatively affects green trust. The concept is called '*greenwash*' and refers to deceiving acts, or any company practice that intentionally misleads consumers through false advertisement (Vermillion & Peart, 2010). It is believed that greenwash can endanger the whole market by providing deceitful information that will scam consumers. Chen and Chang (2013, p. 489) suggested that "companies must reduce their greenwash behaviours to enhance their consumers' green trust". A solution provided is eco-labels. But Langer et al. (2007, p. 338) found out that "the number of eco-labels significantly enhances consumer confusion".

An important demographic segment of the market can reduce this effect provoked by greenwashing, Millennials. According to California Green Solutions (2007) and Smith (2010), Millennials (also referred to as Generation Y's or Echo Boomers) care about the environment. Being a tech-born generation, they have prominent access to information. Therefore, Millennials are a relevant niche for green marketing strategies as their degree of influence on peers and families is notable (Lu et al., 2013). The available literature mentions the enablers to green product adoption (Nath et al., 2013). The study

mentions the consciousness of environmental challenges and sustainably responsible attitudes as relevant enablers for the acquisition of green products. Other enablers are considered and discussed: increasing level of literacy, perceived consumer effectiveness (PCE), green advertisements and labelling, cultural values, legal enforcement, taxes, and incentives. (Nath et al., 2013) conclude that it is essential to exert control on increasing the literacy level to raise green awareness. Hence, knowledge of green products and environmental challenges is a primary enabler.

Regarding the benefits green products provide, Hall and Dickson (2011) conducted research related to green industry products. the study focuses on economic benefits, environmental benefits, and well-being benefits. Firstly, beautification to create an aesthetically-pleasing store environment reduces consumer stress and invites customers. Furthermore, environmental benefits entail energy saving, reduction of soil erosion, and reduction of noise pollution. Lastly, industrial green products reduce stress, improve health conditions, and increase people's feelings of vitality (Hall & Dickson, 2011). Additional environmental benefits such as reduced emissions through the employment of renewable energy incentivise the purchase of green products (Hartmann & Apaolaza-Ibáñez, 2012). Warm glow feelings increase the intention to adopt green products due to the psychological benefit of contributing to the environmental common good (Hartmann & Apaolaza-Ibáñez, 2012). There is a literature gap for the challenges of green products.

Under the European scope, the European Commission (2013a) carried out a study to detect the level of agreement toward building the single market for green products. The Single Market for Green Products initiative was adopted in April 2013 (European Commission, 2013b). Its main goal is to identify the attitudes of European citizens towards this initiative by conducting a survey. The study shows that large majorities of EU citizens believe both that buying environmentally-friendly products can make a difference to the environment (89%) and that environmentally-friendly products are as effective as regular products (74%). Besides, around two-thirds of EU citizens (66%) are fully or fairly confident that products indicated as environmentally friendly will cause less damage to the environment than other products. However, this survey was focused on the sustainable consumption of food-related issues and products lifespan issues. A deep analysis of the literature on eco-friendly products in the fashion industry will be developed to cover this study gap.

1.2. Green products in the fashion industry

According to the European Commission (2021), textiles are the fourth highest-pressure category for the use of primary raw materials and water, after food, housing, and transport, and fifth for GHG emissions. Besides, the fashion industry is the second most ecologically harmful industry (Mahajan, 2012). The EU textile sector, predominantly composed of SMEs, has started to recover after a long period of restructuring, while 60% of the value of clothing in the EU is produced elsewhere. Most importantly in Bangladesh, where a study was carried out by (Asif, 2017, p. 1) "to investigate the overview of sustainability in the apparel manufacturing industry and compare it with the Bangladeshi garment and textile industries". These markets do not fulfil the required living standards and economic indicators of a circular economy. Workers suffer from earning poor wages, working overtime, inequalities at work, or recent fire accidents due to the infrastructure. For instance, the Rana Plaza incident ended with 1129 killed workers in 2013.

Khandual and Pradhan (2019) propose different kinds of sustainable fashion such as DIY (Do-it-yourself), upcycling[1], fair & ethically made, or collaborative consumption. Nevertheless, 100% cotton does not assure the product is completely environmentally friendly since cotton cultivation entails the utilization of pesticides up to now (Khandual & Pradhan, 2018, p. 41). Green products in the fashion industry should convey the principles of the circular economy in reducing waste and employing green raw materials which are not detrimental to the environment. The gradual movement from fast fashion to slow fashion[2] will imply a reduction in the ecological footprint. According to Niinimäki (2010), Green fashion has turned into a critical fad for purchasers, particularly the youthful crowd. However, there is a paucity of literature on how conscious previous generations are of this ethical fashion trend. For instance, Park (2014) focuses on this topic.

Guo et al. (2020, p. 534) concluded a study of the fashion apparel industry that the ideal sustainable level for products increments alongside the degree of value rivalry. This can be linked to an investigation carried out in Italy of the evaluation of new green products of luxury fashion brands. It is stated that extravagance brands, concentrated in fleeting

[1] Upcycling involves the process of converting thrown away objects into a product of higher functionality by reducing waste (Green Empowerment 2016)
[2] Slow fashion is also referred to as eco-fashion, green fashion, or ethical fashion.

products like stylish clothing, dedicate significantly more focus on the protection of the environment today than in the old days (De Angelis et al., 2017). Despite the relevant role sustainability plays in this market, there is an overall convention of the high price of luxury goods.

By introducing green products in the fashion industry several Sustainable Development Goals are achieved, committed un the 2030 EU Agenda (European Commission, 2015). For instance, "Clean water and sanitation" since the fashion industry is one of the biggest water pollutants; "Decent work and economic growth" by improving the working conditions of employees in this industry; "Responsible consumption" since consumers are also responsible for the transition from linear to a circular economy; and "Climate action" to fight against environmental challenges and promote sustainable consumption.

1.2.1. Green products in the fashion industry: consumer perception

According to Wei et al. (2018), consumers who are acknowledgeable of environmental concerns are likely to pay a premium for green products. One of their characteristics is abilities, e.g. motivation in looking for and information from the eco-literacy), as well as cultural values. In other words, those consumers who are willing to pay an additional amount for contributing to the environment can, somehow, afford to purchase luxury brands. Linked to the previous section, there is a connection between the willingness to pay for green products and luxury brands. Furthermore, although consumers who do not have access to eco-literacy will not immediately be willing to pay more for green products, they will undergo increased purchase customer experience after going through the first purchase (Wei et al., 2018). This is defined as the "*greenconsumption effect"*. Purchasing and using a green product increases the consumers' social worth since they feel more valued by society (Tezer & Bodur, 2021). The aforementioned warm glow feelings arise at the purchase stage.

In short, there is a literature gap in reviewing consumers' behaviour towards the purchase of green products in the fashion industry as a whole, not especially in the study of luxury brands. Some authors like Park (2014) focus on the influences of fashion consciousness or eco-fashion consumption decisions. Moreover, it is mentioned that purchasing a green product creates new emotions which motivate and satisfy consumers. Although Nath et al. (2013) discuss the role of enablers in real green product acquisitions, there is a literature gap for the enablers to adopting green products in the fashion industry. Finally, the literature does not cover the challenges of green products, as well as the benefits.

Therefore, these issues will be the variables of interest in the present study.

Further details of the green product concept and additional issues are listed in Table 1. This study is carried out to unveil all these aspects through a survey addressed to different socio-economic profiles.

Table 1. Previous reviews of the product concept

#	Study	Focus
1	Chen and Chang (2013)	Green product confusion due to greenwash
2	De Angelis et al. (2017)	Green products in luxury brands
3	Fraccascia et al. (2018)	Definition of green products
4	Guo et al. (2021)	Green product development in the fashion apparel industry
5	Hall & Dickson (2011)	Benefits of industry green products
6	Nath et al. (2013)	Enablers of green products
7	Tezer and Bodur (2021)	Green warm glow feelings
8	Wei et al. (2018)	Willingness to pay a premium for green products

2. METHODOLOGY

The unit of analysis in this study is consumer-level. This study applies a quantitative methodology through a questionnaire survey to analyse the respondents' awareness and attitudes towards the use of green products in the fashion industry. The questionnaire is based on the work of Carvalho et al. (2020) and is presented in Annex 1. It presents the questions and the scales used in this research. All questions use Likert scales between 1 to 5 to measure the level of agreement, awareness, use and, interest. Information was gathered from December 2020 to June 2021 from a total of 153 respondents.

The method employed to obtain information was the survey as it is founded on the utilisation of inquiries directed to a representation of a specific set of individuals (Malhotra, 2017). In this case, a structured data collection procedure was followed. A formal questionnaire was prepared to gather the necessary information from a certain number of respondents. The vast majority of inquiries are fixed-response option inquiries that demand each interviewee to choose from a deliberate arrangement of answers (Malhotra, 2017, p. 269). The number of answers ranges from 2 to 5 options. For instance, participants had to choose between 5 options to state their level of awareness of green products. The means selected was to carry out an online survey to increase response rates as well as the scope. Furthermore, online surveys have additional advantages such as speed, low cost, and better quality of response. There is a low incidence rate[3] since the

[3] According to Malhotra (2017, p. 287), incidence rate refers to the rate of occurrence or the percentage of persons eligible to participate in the study.

population represents a niche or a highly targeted market. An online survey also provides perceived participant anonymity and enables to contact of certain target groups.

2.1. Measures

The questionnaire consists of six parts, shown in Annex 1. The first part contains questions about the participants' level of awareness regarding the concept of green products. Also, a question about fashion green products' benefits is included. In the third section, the level of agreement with the most relevant challenges towards the use of green products in the fashion sector was evaluated. Similarly, the following part of the questionnaire deals with the level of agreement with the different enablers when buying green products. The fourth part contains questions regarding their daily usage of green products from absolutely not use (1) to fully use (5) as well as their level of interest in Green Fashion compared to Traditional Fashion. In the last part, respondents provide several demographic information.

2.2. Sample

Below, the sampling procedure will be explained, following the five-step process as described in Malhotra (2017).

Firstly, the target population has to be specified. It is defined as the totality of the units that have common features and that comprehend the universe with the aim of solving a marketing research issue (Malhotra, 2017). Inferences are to be made about the population. Concerning this study, the population is defined as university students and their relatives who have a level of awareness of green products and their importance in the fashion industry.

Secondly, the sampling frame is determined. It consists of a "list or set of directions for identifying the target population" (Malhotra, 2017, p. 415). Respondents have been reached through their university email or their phone number.

Thirdly, the sampling technique is determined. In this study, sampling without replacement was the most accurate approach since once an element is included in the sample, it is removed from the sampling frame and cannot be selected again (Malhotra, 2017). Nevertheless, the most relevant decision in the sampling technique process was to use non-probability sampling, which relies on personal judgment rather than on chance to choose the sample units. Among the different classifications of non-probability sampling, convenience sampling was selected. As it indicated, it attempts "to obtain a

sample of convenient elements" (Malhotra, 2017, p. 420). The selection of sampling units is left primarily to personal criteria: accessibility, easiness to measure, and cooperation. Participants are chosen because they happen to be in the right place at the right time. Nevertheless, convenience samples do not represent the general features of quantifiable populations. Henceforth, no theoretical significance can be deduced to generalise the whole population of the sample under consideration (Malhotra, 2017).

Subsequently, the sample size is determined according to the relevance of the study and sample sizes used in similar studies. As aforementioned, this study is based on the work of Carvalho et al. (2020) which gathered information from 110 respondents. Due to the impact of this survey among students and their relatives, it reached 153 individuals. Finally, the sampling process is executed and the sample is validated.

A total of 153 successful questionnaires were collected. Table 2 presents the sample data demographic characteristics which show the respondent's profile. The table contains the frequency distributions for each variable, which are presented in the first column. The second column contains the labels assigned to the different categories of the variable. Moreover, the third column gives the number of participants ticking each value and the fourth column displays the percentages of each category. Missing values are included. With regard to the general respondent's profile, the majority are women (62.1%) against 37.9% of men. Concerning the year of birth of participants, the majority are young adults, born in 1995 and above. The average age of the interviewees is 22 years old. Although a significant 17% of respondents born between 1965 and 1979 represent respondents' parents. Most of them are undergraduate (72.3%), followed by 22.3% classified as 'Other', mainly working activities. Lastly, the average fashion expenditure in a season ranges between 50 and 200€ among 73.9% of participants. It is relevant to highlight that none of the participants spend more than 700€ in a season. Thus, there is barely any respondent who amounts a total expenditure of 400€.

Table 2. Demographic profile of the respondents

Sample Data Demographic Characteristics		Frequency	Percentage (%)
Gender	Male	58	37.9%
	Female	95	62.1%
Year of birth	1995-2010	100	65.4%
	1980-1994	11	7.2%
	1965-1979	26	17%
	Before 1964	14	9.2%
	Missing values	2	1.3%
Course degree attending	Bachelor	109	72.3%
	Master	6	4%
	PhD	2	1.4%
	Other	36	22.3%
Fashion expenditure in a season	50-200€	113	73.9%
	200-400€	36	23.5%
	400-700€	4	2.6%
	More than 700€	0	0%

2.3. Descriptive analytics of green product measures

Out of the 153 respondents, 120, corresponding to 78.4% of the sample, are aware of the concept of green products. On the contrary, 33 participants are not. A definition was given referred to them as products that in the whole cycle lifetime, by this it means the production, consumer use, and disposal of the product generates less environmental impact and is less detrimental to human health than a traditional product equivalent. The aim is to measure their level of awareness from 1 to 5, being the former not aware and the latter very aware.

Table 3 presents the descriptive statistics of all the variables the mean and standard deviation. Given that all the questions follow a Likert scale, values will range from a minimum of 1 to a maximum of 5. Minimum and maximum are not shown.

Table 3. Descriptive statistics of the items

Item		Mean	Std. Deviation
DEF	Awareness – definition of green products	4.04	1.044
ARP	Awareness – garments made with recycled plastic	3.35	1.210
ARD	Awareness – sweaters made with recycled denim	3.42	1.270
ALL	Awareness – products made with liquid leather raw material	2.49	1.358
ASC	Awareness – clothes made with sustainable cotton	3.81	1.266
BRP	Benefits – recycling of plastic	4.22	0.850
BNA	Benefit – no animal killed	4.05	1.166

BRO	Benefits – recycling other tissues	3.98	0.970
CWH	Challenges – don't know where to buy green products	3.77	1.133
CLK	Challenges – lack of knowledge from society	4.20	0.904
CEX	Challenges – products are more expensive	4.23	0.928
CAV	Challenges – stock availability	3.46	1.100
COM	Challenges – lack of communication consumer-seller	3.81	0.998
ERE	Enabler – reduce pollution and waste	4.45	0.819
EHQ	Enabler – high quality	4.04	0.865
ELP	Enabler – low price	1.98	1.070
EAN	Enabler – don't use leather or fur of animals	3.99	1.138
UOP	Use – products made with fibre of organic products waste	1.73	1.170
URP	Use – garments made with recycled plastic	1.98	1.155
USC	Use – clothes made with sustainable cotton	3.01	1.251
TRA	Interest – Traditional Fashion	3.04	1.012
GRE	Interest – Green Fashion	3.85	1.005
PAY	Willingness to pay	1.65	1.233

As observed, there is an overall conscious position regarding the **awareness** of green products. Given these low standard deviations, data are clustered closely around the mean. Hence, information is more reliable. Nevertheless, some extreme values are obtained from participants who are very aware of the concept of green products, whereas there is another share of respondents who are not aware. In fact, they were asked to rate their level of consciousness of the green products available in the market for fashion purposes. For instance, sweaters and clothes made with recycled denim (ARP) or sneakers and clothes made with recycled plastic (ARP). 40 and 31 participants (26.1%) show their consciousness with both items, respectively. Besides, 60% of sample units indicated that they are very aware of the availability of clothes made with sustainable cotton (ASC). It is the case of *Mango*, which created the collection 'Mango Committed'. In 2018, it joined the Better Cotton Initiative (BCI) to strengthen its support for the global harvest of sustainable cotton. By 2025, 100% of the cotton employed to manufacture their garments will be sustainable (Mango Pressroom, 2020). Nonetheless, some green products are unknown to consumers. Specifically, products made with liquid leather raw

material (ALL) by 49% of the sample units. Some of the respondents provided some additional examples:

- Bags made with potatoes
- Sole of shoes made with recycled tyre
- Shoes made with sea waste
- Clothes made with plastic bottles
- Accessories made with cork
- Clothes made with hemp
- Dyes made with onion peel

In short, there is a wide diversity of opinions regarding the different green products available in the market.

Following the variables of interest, participants were asked about their understanding of the **benefits** of using green products in the market for fashion purposes. Among the different advantages, recycling of plastics, no animal killed, and recycling other tissues are the most significant. Almost half of them (49%) indicated to be very aware that the use of synthetic leather and fur to make products imply not to kill any animal or to test on them (BNA). Overall, sample units are aware of the benefits green products bring to the environment, society, and economy. 45% of interviewees stated to be very aware of the recycling of plastics (BRP) green products imply.

Although it is acknowledgeable that green products provide benefits in terms of reducing waste, pollution, and costs, some remaining **challenges** prevent them from their spread in the fashion industry. Respondents were asked to state their level of agreement with the different statements. Half of them (50.3%) totally agree that products are more expensive (CEX). Nonetheless, some examples can be found where green products are neither more expensive nor cheaper. In the aforementioned case of Mango, its collection 'Mango Committed' does not raise the price of its products. This fact may come from a lack of knowledge from the society (CLK) – 45.8% of total agreement – or the lack of communication between seller-consumer (COM) – 30.7% of total agreement. In fact, 37.9% of the sample

units do not know where to buy these products (CWH). There is a market gap to solve this problem. Some additional challenges were provided such as lack of commitment by the Government or lack of information in the media and social network. In general, there is a high level of agreement with the different statements. This fact creates an opportunity for companies to combat these challenges and to spread the purchase of these kinds of products by raising green brand awareness.

Opposite to the challenges green products have to face, the different **enablers** that create an opportunity in the market to spread their commercialisation. The primary reason for the 63.4% of participants is that green products reduce pollution and waste (ERE). Hence, consumers are environmentally friendly and want to contribute to the fight against climate change. Moreover, around 45% totally agreed that the disuse of animal materials (EAN) is relevant when buying green products, followed by 43% for their high quality (EHQ). In other words, the composition of these items is what makes consumers willing to purchase them. 52 respondents somehow agreed that low prices (ELP) are important enablers for them when buying products that are made with green products. Other additional enablers stated by participants were high trustworthiness and commitment.

The relevant question is whether customers are **using** green products in their daily life. As observed in Table 3, the average response is around 2, meaning that they do not usually use these kinds of products. On one hand, the least used products are sweaters and clothes made with recycled plastic (URP) – 49%. Being clothes and ties made with fibres of organic products waste (UOP) – 65.4% – almost not used. However, there is a significant part of respondents, around 20%, who normally use these sorts of green products. On the other hand, the most used green products are clothes made with sustainable cotton (USC), with 40.6% use. Other proposals of green products participants normally use are natural colourants, home accessories made of recycled materials, bags made with potato starch, or shocks made with plastic waste.

The survey also wanted to provide a comparison between the **interest** in Traditional Fashion products (TRA), which follow "make, use and dispose of" practices, with the interest in Green Fashion products (GRE). It is generally conceived that these products comply with the 3R principles of the circular economy (Reuse, Reduce and Recycle). However, it has been aforementioned in the Literature Review

section that the circular economy follows 10 principles: Recover, Recycle, Repurpose, Remanufacture, Refurbish, Repair, Reuse, Reduce, Rethink and Refuse. Around 50% of respondents have a neutral position towards TRA. The contrary happens to GRE, in which participants show a high level of interest (66.6%).

Regarding the economic section of the questionnaire, it was asked whether the participants of this study would consider paying more for green products. Despite having explained the positive contribution green products bring to the fashion industry, 42 sample units (27.5%) indicated that they are not willing to increase their expenditure on these kinds of products. The remaining participants (111), which represent 72.5% of the sample, would consider paying more. Nonetheless, there is a variety of opinions regarding how much more they would be willing to pay. Participants are more likely to pay more than 10% of the price of a traditional fashion product, who amounts to 32% of the sample. Furthermore, more respondents would consider paying 15% rather than an additional 5% increase in price – 30 participants (19.6%) against 27 (17.6%). Only 1 respondent would be willing to pay more than 25% of a Green fashion product.

To conclude the questionnaire it was asked whether their knowledge about the importance of green products in the fashion industry has increased. Given all the information provided about the concept of green products, their benefits, and challenges, 93.5% of the sample units have increased their knowledge about the importance of green products in the fashion industry. It could be inferred that the remaining 10 respondents already had significant knowledge of their relevance for this sector.

3. EMPIRICAL ANALYSIS

Data were analysed through SPAD statistical software version 5.6 elaborated by CISIA-CERESTA (Lebart et al., 2001; Nakache & Confais, 2000). It enables the analysis through methods not found in other relevant statistical software. Variables can be selected and defined according to their nature: supplementary categorical (N) or continuous (C), in the case of Likert scales. Which facilitates the treatment of the data with the help of the functions heterogeneity offered.

The quantitative research approach was carried out through the following procedure (De Canio et al., 2016). Firstly, the principal component analysis (PCA) is computed. The aim is to identify the latent structure of the variables studied, emphasising the importance consumers give to green products. Then, once the PCA presents the factorial coordinates, a factor-based cluster analysis is performed to group the respondents. Participants were gathered to explain the relationship both to initial variables and to the factors (Abascal et al., 2006).

To carry out a PCA analysis several indicators need to be considered. The Bartlett's Test of Sphericity ($\chi^2_{(45)}$ = 1269.817, p-value = 0.000) and the KMO = 0.751 manifest the fitness of the sample. The interpretation is average and a substantial correlation in the information is found. Additionally, all the variables exhibit commonalities equal to or above 0.50. This is a measure of the adequate significance of the PCA.

Then, the core of the PCA is the eigenvalues of a covariance matrix. It is represented in the table below (Table 4). They mainly explain the variation of the data. The trace of matrix is 23, which equals the total number of variables (Table 3).

Table 4. Control panel of Eigenvalues (Trace of matrix: 23.00000)

Number	Eigenvalue	Percentage	Cumulated Percentage
1	5.3553	23.28	23.28
2	2.4688	10.73	34.02
3	2.0951	9.11	43.13
4	1.6992	7.39	50.52
5	1.2775	5.55	56.07
6	1.1899	5.17	61.24
7	0.9999	4.35	65.59
8	0.9092	3.95	69.54
9	0.8108	3.53	73.07
10	0.7629	3.32	76.39
11	0.7058	3.07	79.45
12	0.6491	2.82	82.28
13	0.6150	2.67	84.95
14	0.5519	2.40	87.35
15	0.4948	2.15	89.50
16	0.4797	2.09	91.59
17	0.3920	1.70	93.29
18	0.3622	1.57	94.87
19	0.2979	1.30	96.16
20	0.2692	1.17	97.33
21	0.2213	0.96	98.29

22	0.2068	0.90	99.19
23	0.1855	0.81	100.00

As observed in Table 5, the first four elements explain around 50% of the variability of the phenomenon. Given these components, it is enough to draw applicable conclusions since their magnitudes are above one. In fact, adding two additional axes, more than 60% of the information provided by the interviewees is explained.

Table 5. Active variables-factors correlations

Label variable	Axis 1	Axis 2	Axis 3	Axis 4	Axis 5
DEF	0.61	0.07	0.23	-0.14	0.13
ARP	0.71	0.21	-0.09	-0.16	0.13
ARD	0.75	0.19	-0.07	-0.21	0.01
ALL	0.46	0.08	-0.34	-0.30	0.15
ASC	0.72	0.14	0.09	0.07	0.15
BRP	0.58	0.28	0.27	-0.04	-0.03
BNA	0.62	0.01	0.52	0.12	0.02
BRO	0.79	0.01	0.27	-0.08	-0.06
CWH	0.06	-0.65	-0.39	0.30	0.02
CLK	0.21	-0.67	-0.21	0.26	0.11
CEX	0.29	-0.41	0.19	-0.29	0.13
CAV	0.33	-0.57	-0.28	-0.30	0.10
COM	0.31	-0.43	-0.36	-0.35	0.06
ERE	0.61	-0.27	0.12	0.45	0.07
EHQ	0.46	-0.27	0.04	-0.22	-0.53
ELP	0.11	-0.18	0.10	-0.29	-0.56
EAN	0.47	-0.21	0.16	0.38	-0.19
UOP	0.26	0.35	-0.67	-0.10	-0.22
URP	0.26	0.39	-0.64	0.08	-0.09
USC	0.45	0.49	-0.26	0.37	-0.06
TRA	0.23	0.05	-0.03	-0.33	0.45
GRE	0.50	-0.07	-0.18	0.40	-0.30
PAY	0.22	0.00	-0.17	0.36	0.42

The first axis shows a strong correlation (larger than 0.7 in absolute value) in four out twenty-three variables of green products purchases and a moderate correlation (larger than 0.5 in absolute value) in four additional variables. The second axes only show a relevant correlation in two challenges – CLA and CAV – in a negative direction. The reliability of data is assessed using Cronbach's alpha is 0.818. It is recommended a value higher than 0.7 for being acceptable. Concerning the outcome obtained, information is reliable and adequate for additional analysis.

Results are evaluated through the following methodology: a **cluster analysis**. Cluster analysis (Table 6) gathers similar customers given specific variations within each group with the aim of achieving more effective marketing strategies to apply in the fashion industry. Consumers are targeted via personalization to reveal their interests and preferences. In other words, it segments a homogeneous group of consumers based on the different variables discussed above. Socio-demographic indicators (gender, year of birth, and occupation) and behavioural variables (average expenditure in a season) have been evaluated. The following procedure is conducted. Firstly, a factor-based cluster analysis to determine the parameters. Then, and most importantly, a cut of the tree and clusters description. This step provides the segmentation of the four following groups and their corresponding characteristics regarding the aforementioned demographic and behavioural variables.

Table 6. Cluster Analysis

N. cluster	N. cases	%
1	37	24.18%
2	28	18.30%
3	40	26.14%
4	48	31.37%

The following table (Table 7) shows a summary of the methodology employed. It specifies the sample, sample procedure, and type of questionnaire.

Table 7. Technical Details of the Research

Methodology	PCA and Cluster Analysis
Sample	153 respondents
Reference period	December 2020 – June 2021
Types of questionnaire	Online survey
Sample procedure	Convenience sampling
Software	SPAD 5.6

4. RESULTS AND DISCUSSION

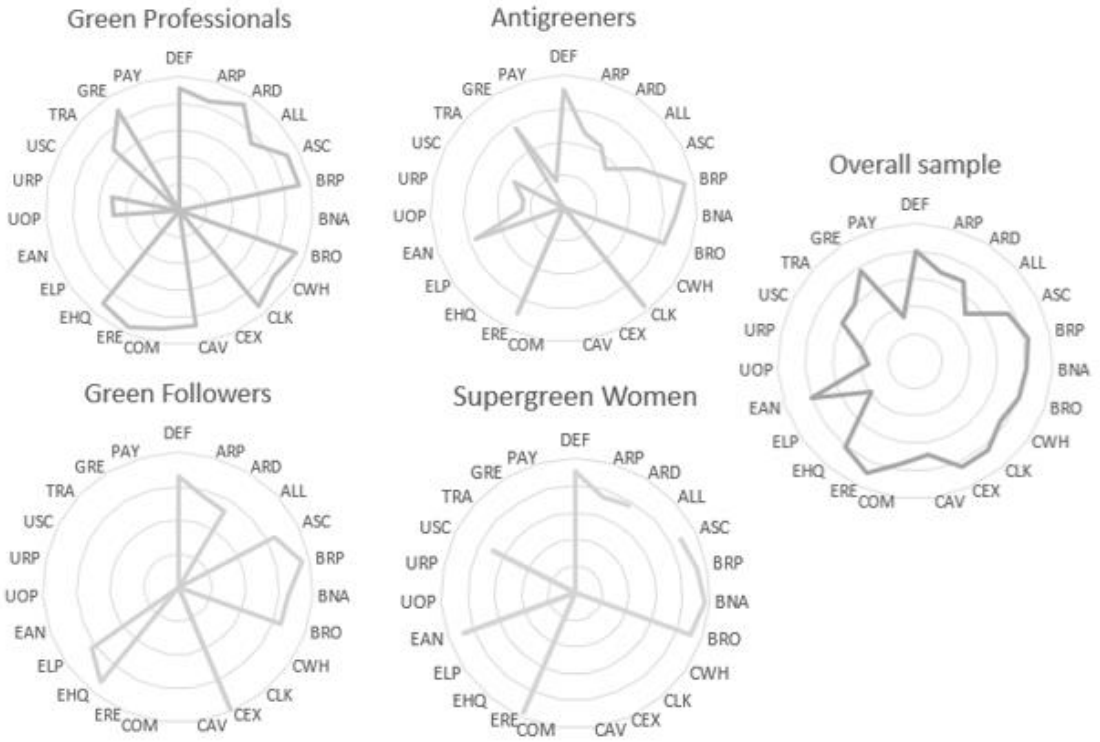
4.1. Green product purchasers profiles

The four targets of the different green products consumers through several variables – awareness, benefits, challenges, enablers, and attitudes – are identified. Demographic and behavioural dissimilarities have been statistically tested between the four clusters. In the following figure (Figure 1), the main differences regarding the studied variables

compared to the overall sample are presented. Hence, four graphs were developed of each cluster and an additional representation of the overall sample.

In the figure, the cluster mean is displayed for each of the segments, indicated in the tables below. The further from the origin, the larger the value of each variable, which is indicated in Annex 1. There are some missing values since, for each cluster, several variables are not characteristic. The main characteristics of each cluster will be detailed and compared to the overall sample features, as the overall mean for each variable is presented in the tables.

Figure 1. Cluster distribution



4.1.1. Green Professionals

The first cluster is composed of interviewees who have a job occupation, mainly Generations X and Y. These consumers are aware of the concept of green products and the wide array of items available in the market, such as sneakers and clothes made with recycled plastic. In fact, they regularly use them. Their interest in Sustainable Fashion prevails over Traditional Fashion due to the benefits it brings to society, animals, and the environment. For those consumers, the reduction in pollution and waste and the high quality of green products are relevant enablers. Nevertheless, they believe the lack of knowledge from society and the stock availability are some remaining challenges green

products in the fashion industry need to work out. Results are retrieved from Table 8, which shows the characteristic variables for *Green Professionals*.

Table 8. Green Professionals

Characteristic variables	Cluster mean	Overall mean	Cluster Std. deviation	Overall Std. deviation	Test-value	Probability
ARD	4.622	3.418	0.586	1.266	6.62	0.000
ALL	3.649	2.490	1.235	1.353	5.96	0.000
CAV	4.324	3.464	0.737	1.097	5.46	0.000
ARP	4.243	3.346	0.785	1.206	5.18	0.000
BRO	4.622	3.980	0.538	0.967	4.62	0.000
COM	4.459	3.810	0.757	0.995	4.54	0.000
UOP	2.459	1.732	1.387	1.166	4.34	0.000
ASC	4.541	3.810	0.682	1.262	4.03	0.000
GRE	4.378	3.850	0.850	1.002	3.67	0.000
EHQ	4.486	4.039	0.598	0.862	3.61	0.000
URP	2.568	1.980	1.326	1.152	3.55	0.000
DEF	4.568	4.039	0.547	1.041	3.53	0.000
CLK	4.649	4.196	0.580	0.901	3.50	0.000
CWH	4.297	3.771	0.896	1.129	3.24	0.001
BRP	4.568	4.216	0.595	0.847	2.89	0.002
ERE	4.730	4.451	0.553	0.816	2.38	0.009
TRA	3.378	3.039	1.099	1.009	2.34	0.010

4.1.2. Antigreeners

The second cluster is called *Antigreeners*. It is formed by men who do not consider paying more for these kinds of products. It is a target of consumers that are absolutely not aware of the idea of green products as so as their availability. They strongly agree lack of knowledge from society negatively affects the purchase of sustainable goods. Actually, they are not conscious of the diverse benefits of green products – recycling of plastics and other tissues, and no animal is tested or killed. Enablers such as the reduction of pollution or ethical conduct in animals do not pull their interest. Results are retrieved from Table 9, which shows the characteristic variables for *Antigreeners*.

Table 9. Antigreeners

Characteristic variables	Cluster mean	Overall mean	Cluster Std. deviation	Overall Std. deviation	Test-value	Probability
UOP	1.250	1.732	0.634	1.166	-2.41	0.008
CLK	3.821	4.196	1.071	0.901	-2.43	0.008
DEF	3.571	4.039	1.178	1.041	-2.62	0.004
ALL	1.714	2.490	0.749	1.353	-3.35	0.000
BRP	3.714	4.216	1.097	0.847	-3.45	0.000

BNA	3.357	4.046	1.342	1.162	-3.46	0.000
URP	1.250	1.980	0.433	1.152	-3.70	0.000
PAY	0.857	1.647	1.216	1.229	-3.75	0.000
BRO	3.214	3.980	1.013	0.967	-4.62	0.000
ARP	2.357	3.346	1.109	1.206	-4.79	0.000
ARD	2.179	3.418	0.928	1.266	-5.71	0.000
ASC	2.571	3.810	1.266	1.262	-5.73	0.000
EAN	2.821	3.993	1.283	1.135	-6.03	0.000
GRE	2.786	3.850	0.977	1.002	-6.20	0.000
USC	1.679	3.013	0.758	1.247	-6.24	0.000
ERE	3.464	4.451	0.906	0.816	-7.06	0.000

4.1.3. Green Followers

The *Green Followers* cluster is formed by those who are not knowledgeable of the meaning of green products but will consider paying more. It seems that, despite not being conscious of their handiness in the market and the benefits they offer, they assert the higher price of these items is not a challenge. Thus, they follow this green trend of reducing pollution and respecting animal rights. Although *Green followers* are not attracted by the high quality of green products, they will increase their expenditure on these goods. Results are retrieved from Table 10, which shows the characteristic variables for *Green Followers*.

Table 10. Green Followers

Characteristic variables	Cluster mean	Overall mean	Cluster Std. deviation	Overall Std. deviation	Test-value	Probability
CEX	3.925	4.229	0.959	0.925	-2.41	0.008
ASC	3.250	3.810	1.178	1.262	-3.26	0.001
ARP	2.800	3.346	0.954	1.206	-3.32	0.000
EHQ	3.625	4.039	0.796	0.862	-3.52	0.000
ELP	3.150	3.667	1.014	1.066	-3.55	0.000
BRP	3.750	4.216	0.733	0.847	-4.03	0.000
ARD	2.650	3.418	0.963	1.266	-4.45	0.000
BNA	3.275	4.046	1.072	1.162	-4.86	0.000
DEF	3.300	4.039	1.054	1.041	-5.21	0.000
BRO	3.250	3.980	0.733	0.967	-5.54	0.000

4.1.4. Supergreen Women

The last cluster gathers women who are engaged in the concept of green products. These participants are aware of the availability of sneakers and clothes made with recycled plastic or sweaters made with recycled denim, among others. Furthermore, these

supergreeners know the benefits the consumption of green products brings to society and the environment. Pollution and waste are reduced and they are produced following ethical standards, mainly related to animals. As a matter of fact, the contribution to the environment and the disuse of leather or fur of animals in the manufacturing process leads to the possession of eco-friendly products. Most of the participants of this cluster mainly own clothes made with sustainable cotton. Results are retrieved from Table 11, which shows the characteristic variables for *Supergreen Women*.

Table 11. Supergreen Women

Characteristic variables	Cluster mean	Overall mean	Cluster Std. deviation	Overall Std. deviation	Test-value	Probability
BNA	4.854	4.046	0.456	1.162	5.80	0.000
BRO	4.542	3.980	0.538	0.967	4.84	0.000
ASC	4.438	3.810	0.814	1.262	4.14	0.000
BRP	4.625	4.216	0.525	0.847	4.03	0.000
DEF	4.521	4.039	0.677	1.041	3.86	0.000
ERE	4.813	4.451	0.485	0.816	3.69	0.000
EAN	4.438	3.993	0.788	1.135	3.26	0.001
USC	3.479	3.013	1.041	1.247	3.12	0.001
ARD	3.854	3.418	0.935	1.266	2.87	0.002
ARP	3.688	3.346	1.064	1.206	2.36	0.009
CAV	3.104	3.464	0.872	1.097	-2.74	0.003
UOP	1.333	1.732	0.825	1.166	-2.85	0.002
CLK	3.833	4.196	0.898	0.901	-3.36	0.000
COM	3.354	3.810	0.968	0.995	-3.82	0.000
CWH	3.250	3.771	1.127	1.129	-3.85	0.000

4.2. Clusters characteristics

To have a deep understanding of the clusters, the demographic variables of each group are displayed in the following table (Table 12). Clusters are analysed according to certain features: gender, year of birth, occupation, level of awareness of green products, fashion expenditure in a season, willingness to pay more, and increased knowledge after having concluded the questionnaire.

Table 12. Descriptive characteristics of the clusters

Cluster	Green professionals	Antigreeners	Green followers	Supergreen women	Total sample
Sample	37	28	40	48	153
Gender					
Female	78.38%	32.14%	50%	77.08%	62.1%
Male	37.91%	67.86%	50%	37.91%	37.9%
Age					
1995-2010	43.24%	67.86%	75.00%	77.08%	66.7%
1980-1994	10.81%	3.57%	5.00%	8.33%	5.9%
1965-1979	24.32%	25.00%	12.50%	12.50%	17.6%
<1964	21.62%	3.57%	7.50%	6.25%	9.8%
Level of Studies					
Bachelor	56.76%	71.43%	80.00%	66.67%	68.6%
Master	0%	7.14%	2.50%	4.17%	4.6%
PhD	0%	3.57%	2.50%	0%	1.3%
Higher Education	2.70%	0%	2.50%	4.17%	2.6%
Working	37.84%	17.86%	12.50%	18.75%	21.6%
High school	2.70%	0%	0%	2.08%	1.3%
Awareness					
Yes	89.19%	75.00%	52.50%	93.75%	78.4%
No	10.81%	25.00%	47.50%	6.25%	21.6%
Expenditure					
50-200€	64.86%	75.00%	77.50%	77.08%	73.9%
200-400€	32.43%	21.43%	22.50%	18.75%	23.5%
400-700€	2.70%	3.57%	0%	4.17%	2.6%
Willingness to pay more					
Yes	72.97%	42.86%	87.50%	77.08%	72.5%
No	27.03%	57.14%	12.50%	22.92%	27.5%
Increased Knowledge					
Yes	100%	85.71%	95.00%	91.67%	93.5%
No	0%	14.29%	5.00%	8.33%	6.5%

Almost a third of the participants are *Supergreen women*. It is the most profitable cluster due to the highest level of green consciousness in the sample – 93.75% of the members knew the definition of green products. it is higher than the sample's knowledge of green products. As indicated, it is formed by 77.08% of women born between 1995 and 2010, who are undergraduate or have recently graduated from university. Nevertheless, there is an influential percentage of working people in this cluster – 18.75%. Their average expenditure is around 50 and 200€,

although they are willing to pay more for eco-friendly products. Hence, companies should target this cluster to raise their engagement with Green Fashion and increase their income. Actually, *Supergreen women* stated to have increased their knowledge in the availability, benefits, and challenges of green products.

It is important to highlight that most of the respondent's level of study is Bachelor as the questionnaire was directed to university students.

The *Green Followers* represent more than a quarter of the sample units. There is gender equality in the cluster – 50% female and 50% male. Similar to the former cluster, it is clearly formed by undergraduate participants born between 1995 and 2010. No particular relevance has been found regarding the average expenditure of *Green Followers* concerning the total sample. On the contrary, it was expected that their awareness of the concept of green products would be lower than the average level of the remaining participants. In fact, 52.50% of the members of this cluster knew the definition of sustainable fashion products in advance, whereas a significant 47.50% were unfamiliar with this idea. Nevertheless, their knowledge of green products increased after concluding the questionnaire. It is important to emphasize that they would be willing to pay more for these products. As induced by the designation of this cluster, it is formed by participants who are ignorant of the concept of green products but are disposed to increase their expenditure in Green Fashion.

Similar in representativeness, *Green Professionals* constitute 24% of the surveyed population. Dissimilar to the total sample, it is formed by almost 80% of working female *baby boomers* and Gen X who are significantly mindful of green products (89.19%). Due to their occupation, their average expenditure is higher than the total sample. 32.43% of interviewees spend around 200 and 400€ on green products in a season against 23.50% of the total sample. As a matter of fact, 72.91% are willing to increase even more their expenses on green products. Despite the meaningful percentage of participants aware of the concept of green products, all the members of *Green Professionals* indicated that their knowledge of Green Fashion has increased after completing the questionnaire. It is a profitable group of consumers in the sense that their income level exceeds the earnings of the remaining clusters.

Finally, the smallest segment of Green Products purchasers is the *Antigreeners*.

They represent 18% of the surveyed population. However, due to their negative impact on Sustainable Fashion, it is the most relevant cluster. Marketers should focus their attention on these potential consumers to engage them in the concept of green products and become actual customers.

Antigreeners are mainly formed by males (67.86%) who belong to Generation Z and are undergraduates. Another relevant feature of this cluster is that it is also formed by Generation X participants who are employed (17.86%). None of these members are attending high school or have a Higher Education Certificate. Even though 75% of this profile knew the definition of green products and spend around 50 and 200€ on Green Fashion, higher than the average of the total sample, they are not willing to pay more. *Antigreeners* are opposed to increasing their expenditure on eco-friendly products and contributing to the environment and society. Notwithstanding, 85.71% increased their knowledge after concluding the questionnaire.

5. MANAGERIAL IMPLICATIONS

Firstly, the findings are vital for marketers in the fashion industry that commercialise green products. Given the negative predispositions of some groups of consumers, especially *Antigreeners*, to purchase these eco-friendly alternatives, organizations need to change society's mindset. Nonetheless, changing these existing negative predispositions is difficult to modify. Several practical solutions will be proposed to motivate consumers in the purchase of fashion green products.

Based on the results, a group of consumers is sceptical about the choice of buying these items. Marketeers should create an incentive to turn them into actual customers. For instance, green fashion brands can develop campaigns to raise the level of awareness concerning the concept and availability of green products. A small group of the interviewees that represents 21% of the sample stated that they are absolutely not aware of the definition of green products as well as the wide variety offered in the fashion market. Henceforth, companies should communicate their product portfolio in a way that is innovative and appealing to penetrate this niche market. Social media initiatives can be carried out as it is a direct approach to target new consumers. Furthermore, these participants strongly agreed with the statement of lack of knowledge from the society. This issue creates an opportunity for emerging and existing green brands to inform the benefits of consuming green

products. Advertisements can be developed to differentiate their products from Traditional Fashion articles since they use sustainable materials during the manufacturing process as so as to respect animals' rights. To recap, companies should communicate the diverse benefits of their products. *Antigreeners* are a profitable niche market to target and to convert them into actual consumers.

Regarding *Green Followers,* sustainable fashion brands should also raise their level of awareness given their disposition to increase their expenditure on green products. Similar campaigns can be developed to inform them about the concept of eco-friendly goods in the fashion industry. It is highly important to communicate the range of products offered given the lack of knowledge on their availability. Additionally, these consumers stated that they are not pulled by the high quality of green products. Thus, it creates an occasion to communicate the list of sustainable materials used, which in turn increases the durability of the goods. The purchase of a green product is a long-lasting investment.

Furthermore, green organizations can take advantage of *Green Professionals'* high level of purchasing power. Given that this cluster is formed by consumers that are occupied, companies can benefit from their willingness to pay more. It would be recommended to increase their awareness and to communicate the availability of products. Actually, they believe the lack of knowledge from society is a remaining challenge green products in the fashion industry need to solve. A campaign that raises overall green consciousness would be profitable.

Finally, *Supergreen Women* could propel the purchase of green products by word-of-mouth (WOM) strategies. As suggested in (Hong et al., 2020), WOM practices take combinational consequences for shoppers' buy practices and further influence companies' choices. In fact, e-WOM by '*influencers'* in social media is an appealing strategy for green brands. By communicating the advantages their products offer, these young public figures can reach new potential consumers and influence social media users who are against the purchase of green products. For instance, companies can send their products to influential Instagram profiles so they can try out and obtain a real perspective of the benefits eco-friendly products provide. Hence, users can obtain honest recommendations. This strategy generally implies positive outcomes for brands as it will increase green trust.

Different campaigns can be developed regarding the type of consumer and their

level of knowledge of green products as so as their benefits. Besides, companies need to avoid 'greenwash' to enhance consumers in green trust.

6. LIMITATIONS AND FUTURE RESEARCH

In spite of the presented contributions, this study has several limitations that need to be mentioned.

From the methodological standpoint, the first limitation of this research is the use of a convenience sample. Hence, the generalizability of the results is limited and cannot be applied to the whole population. The process of selection of participants under convenience sampling is mainly based on the accessibility to the sample units. Given the fact that this study is carried out at the Public University of Navarre, individuals are predominantly students of the Marketing subject during the 2020-2021 academic year. Participants were asked to share the questionnaire with relatives. Hence, they represent more than a quarter of the sample. Additional studies should replicate this paper introducing additional population segments.

Furthermore, the final sample only includes Spanish participants. The EU Single Market for Green Products (SMGP) initiative increases the need for further researches to investigate differences in green products awareness at the European level (European Commission, 2013b). Henceforth, a cross-national study will highlight behavioural and demographic divergences among European citizens. Nonetheless, this research could be also carried out at an international level to study the differences between developed and less advanced economies. Provided that developing countries suffer from climate change at a higher degree than modern nations, contrasting conclusions of interest can be reached. The level of awareness and interest of the population of developing countries can be assessed to perform diverse strategies to remove environmental inequities between these economies.

Finally, closer attention to the variables is required. An examination of the questionnaire should be needed to redesign the answers given that some examples of green products are not widely familiar. Future research of green products in the fashion industry is needed to comprehend the market and the active trends. A rigorous focus on the benefits should be performed to raise the level of green awareness of future participants, especially of *Antigreeners* profiles.

CONCLUSIONS

This study is one of the first attempts in studying consumer behaviour towards green products in the fashion industry. Even though additional literature on green products can be found, authors do not focus on this sector. In particular, Carvalho et al. (2020) studies both circular economy and green product attitudes and awareness but it does not account for in-depth research of products in the green fashion, attitudes, benefits, enablers, challenges, and awareness. Hence, the contribution of this research is valuable for both academia and management. Furthermore, it will provide deeper insights into the implications of green product awareness to the European Union. As has been aforementioned, the EU Commission created the CEAP, included in the European Green Deal (European Commission, 2020b). The analysis will help in developing new policies or modifying existing initiatives so consumers include green products in their baskets.

The procedure carried out was a cluster analysis, which served to distinguish four customer segments with similitudes according to demographic and behavioural variables: Antigreeners, Green Followers, Green Professionals, and Supergreen Women. Having conducted a deep analysis on the differences of the four clusters, it can be induced that women are greener aware. Overall, 62.1% of the sample are female consumers. Nonetheless, closer attention should be paid to two green product purchaser profiles: Supergreen Women and Green Professionals. Where a greater representation of women is found, 77.08% and 78.38% respectively. However, a more profound focus through campaigns and initiatives should be put on men to raise their green awareness. Actually, Antigreeners, formed by 67.86% of men, are opposed to increasing their expenditure on green products and contributing to the environment and society. The proposed measure is to concentrate efforts in targeting males who are against green product consumption in the fashion industry and raise their green awareness.

Results also emphasized a great diversity according to the year of birth. It is generally conceived that Generation Z is the most involved with the environment, reducing the harmful effects of climate change, pollution, or clothing waste on present and future generations. On the contrary, the results obtained differ from this fact. The analysis that has been carried out shows that Generation Z is highly committed to the environment. In fact, more than 45% of *Green Professionals*

consumers were born between 1964 and 1980. In conclusion, the level of engagement in purchasing green products is not related to age. Consumers are increasingly aware of the detrimental effects of Fast Fashion on the environment.

An additional finding of this study is the general lack of awareness of the policies. Their principles are unknown to many participants. The CEAP aims to convert the European Union into a green environment where consumers' rights are respected (European Commission, 2020a). Despite being an ambitious plan, it needs the engagement of society. More than 20% of the interviewees are not aware of these kinds of proposals to fight against climate change. Although this study cannot be generalized to the whole population, it creates incentives to reach a larger scope to raise green awareness. It is worth mentioning that *Green Professionals* increased their level of environmental consciousness after concluding the questionnaire. If 93.5% of the total sample increased their knowledge once completing the questionnaire, what would happen if these initiatives were directed towards a more substantial audience?

In a nutshell, the aforementioned implications of this study have contributed to developing a deep analysis of consumers towards the purchase of products offered by green fashion companies. Not only are demographic variables relevant for determining the willingness to consume green products, such as gender or year of birth, but also behavioural characteristics. Society's disposition to become fashion green consumers depends on their green knowledge and awareness. Nevertheless, future studies will identify more benefits, challenges, and enablers to the adoption of green products.

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ANNEXES

Annex 1. Questionnaire - Questions and Scales

Questions	Likert-Type Scale Response Anchors
Do you know what green products means?	a – Yes b – No
Are you aware of the green products, referring them as products that in the whole cycle lifetime, by these it means the production, consumer use and disposal of the product, produces less environmental impact and is less detrimental to human health than a traditional product equivalent? – DEF	Level of Awareness 1 – Not aware to 5 – Very aware
Are you aware of the green products available in the market of fashion purposes? a) Sneakers and clothes made with recycled plastic – ARP b) Sweaters made with recycled denim – ARD c) Products made with liquid leather raw material (product in the lab) – ALL d) Clothes made with sustainable Cotton – ASC e) Other? Identify	Level of Awareness 1 – Not aware to 5 – Very aware
Do you understand the benefits of using green products available in the market of fashion purposes? a) Recycling of plastics - reusing plastic materials to reduce waste and environmental pollution – BRP b) No animal killed - using synthetic leather and fur to make products and for not to kill animals – BNA c) Recycling other tissues - reducing waste, the pollution, costs, and other resources – BRO	Level of Awareness 1 – Not aware to 5 – Very aware
What are the most relevant challenges towards the use of green products in the fashion sector. a) Don't know where to buy these products – CWH b) Lack of knowledge from the society – CLK c) Products are more expensive – CEX d) Availability of products - stock availability – CAV e) Lack of communication seller-consumer – COM f) Others? Identify	Level of Agreement 1 – Totally disagree 5 – Totally agree
What would be important enabler for you (of the fashion industry) when you are buying products that are made with green products. a) Reduce the pollution and waste – ERE b) High quality – EHQ c) Low price – ELP d) Don't use leather or fur of animals – EAN g) Other? Identify	Level of Agreement 1 – Totally disagree 5 – Totally agree
Are you actually using green products day by day? a) Clothes and ties made with fibres of organic products waste (for example: citrus peel) – UOP b) Sneakers and clothes made with recycled plastic – URP h) Clothes made with sustainable Cotton – USC i) Other? Identify	Frequency of Use 1 – Not Using 5 –Using
Are you interested in Traditional Fashion products (make, use, dispose) or in Green Fashion products (reuse, repair, recycling)? a) Traditional Fashion – TRA	Level of Interest 1 – Not interested 5 – Very interested

b) Green Fashion – GRE	
Would you consider paying more for green products? a) Yes b) No If you answered yes, how much would you be willing to pay? – PAY a) More than 5% b) More than 10% c) More than 15% d) More than 20% e) More than 25%	Level of Willingness to Pay a – Extremely low (More than 5%) 5e– Extremely high (More than 25%)