



**Politecnico
di Torino**

Politecnico di Torino

Corso di Laurea Magistrale in Ingegneria Gestionale (Management Engineering)

A.a. 2021/2022

Sessione di Laurea Ottobre 2022

Sustainability in the Fashion Industry

An empirical analysis of the influence of certified eco-labels on
consumer behavior

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Acknowledgements

I would like to thank sincerely Prof. Luigi Benfratello for his patience and dedication in supporting the preparation of this thesis. His suggestions and advice carried out a fundamental importance.

Moreover, I am grateful to my University, Politecnico di Torino, for the opportunities I received during these years and the high-level education I was provided with.

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Abstract

The aim of this thesis is to acquire a deeper knowledge and sensitivity towards the theme of sustainability, together with its business applications. After an initial overview of the main practices associated to it, this paper shifts its attention to the Textile Industry and its main challenges related to ecological and social sustainability. Afterwards, the strategic importance of Corporate Social Responsibility integration into the core business, the role of a transparent communication and the use of eco-labels in the Fashion Industry are discussed. Precisely, the effect of certified eco-labels, put on clothing and accessories, on consumer behavior is investigated in the final part of this thesis. Attitudes for more than 250 respondents to an online survey have been investigated through multiple regression. Consumer attitude towards the company, his intention to buy and his willingness to pay more for sustainability have been explained by consumer's socio-demographic characteristics (age, gender, profession, education) and by his awareness about Fashion Industry's social and environmental problems and the certified eco-labels' knowledge. Results show that awareness and knowledge play an important role for shaping consumer's attitude towards sustainability issues. In turn, firms can use certified eco-labels on clothing and accessories to set higher prices.

Introduction

The new generations are more socially and environmentally conscious about the negative impacts of the Textile industry, being the second largest polluter among the industrial sectors. They have expectations about fashion brands to innovate their production processes and to develop new sustainable business models, in order to meet these newborn needs (Amatulli et al., 2020). This is demonstrated by the emergence of Slow Fashion movement as a response to the dangerous threats of overproduction and overconsumption, guided by Fast Fashion.

Moreover, competition is tight, and consumers request to be informed about each action and process involved in the complex Fashion supply chain. Sustainability and its related business practices became a key success factor to build long-term competitive advantage.

In turn, it is crucial for fashion companies to develop a transparent business strategy which integrates sustainability into its core. Companies are called upon to share with customers all their efforts, initiatives and investments in such direction. For instance, by implementing CSR auditing and reporting systems or by communicating with eco-labels, in order to raise consumers' environmental and social awareness (Amatulli et al., 2020).

These “green” practices, Circular Economy and Corporate Social Responsibility to mention a few, need to be internalized throughout the organization, adopting a holistic approach. They will become part of a company's culture, people, and processes, along three interconnected dimensions of sustainability: *people, planet, and profits* (Franco et al., 2020).

Firstly, this thesis explores, in Chapter 1, the discussion of some founding concepts, being Sustainability, Circular Economy, and CSR strategies. In particular, the strategic and competitive importance of their integration into the business strategy is analyzed in Chapter 3. Secondly, an overview of the Textile industry and its environmental and social impacts is performed. The potentiality of Slow Fashion, as a sustainable response to such degradation, is discussed, together with its impact on consumer behavior. A quick overview on Sustainable Business Models is done at the end of Chapter 2, mentioning some brands from which several best practices can be learned.

The first part of Chapter 3 deals with the role of transparent communication and its impact on companies' value; the widespread practice of greenwashing is explained as well.

Moreover, eco-labels as communication tools are introduced in the second part of the chapter. After an initial classification and a general presentation, with a specific link to their application in the Fashion industry, they become the focal point of the empirical analysis.

In fact, this research attempts to investigate the role of certified eco-labels in the Fashion industry and how they can influence consumer behavior, through an online survey. Three variables are used to explain such behavior: consumer's attitude towards the company, his purchase intention and his willingness to pay a premium for sustainability (Rutten, 2022). Additionally, consumers' awareness of the environmental and social impacts generated by the Fashion industry and their knowledge of certified eco-labels are studied as mediating factors (Rutten, 2022).

In particular, this thesis has two main goals. Firstly, it is aimed to understand if certified-eco labels, perceived as more credible than general ones, positively impact and enhance consumer's behavior, articulated through the set of variables previously defined. Secondly, the other object of investigation is to understand whether consumers' awareness of impacts and their knowledge of certified eco-labels have a positive influence too.

In such cases, fashion companies should invest consistently in sustainable and transparent business practices, coupled to effective marketing and communication campaigns, aimed to inform consumers and raise their environmental awareness and knowledge about eco-labels, as they positively contribute to attitude towards the company, purchase decision and consumer's willingness to pay a price premium (Rutten, 2022).

1. Theory of Sustainability: insight into Corporate Social Responsibility and Circular Economy

1.1 A definition of Sustainability

Sustainability means meeting our own needs without compromising future generations, ensuring they will be able to meet their needs satisfactorily (“What is sustainability?”, 2022). Sustainability is not just about the environment, but it embeds “concerns for social equity and economic development” (“What is sustainability?”, 2022). These three dimensions are described below.

Environmental Sustainability deals with ecological integrity’s maintainance, as well as the balance between natural resources’ rate of consumption by humans and their ability to auto-replenish (“What is sustainability?”, 2022).

Economic Sustainability relates to the ability of human communities to be independent and have access to the resources they need (“What is sustainability?”, 2022).

Social Sustainability is concerned with granting universal human rights and basic necessities for all people in the world, to whom will be ensured access to resources in order “to keep their families and communities healthy and secure” (“What is sustainability?”, 2022). Moreover, personal, labour, and cultural rights must be respected, and all people protected from discrimination (“What is sustainability?”, 2022).

When considering its business application, sustainability relates to the firms’ ability to make profits without harming both society and environment (Spiliakos, 2018). The intersection between social, environmental and financial progress is called “*shared value opportunity*” (Spiliakos, 2018). In fact, it means that “doing good” by addressing sustainability issues can impact companies’ ability to “do well” (Spiliakos, 2018).

Sustainability is now considered a *key success factor*, because “investors use environmental, social, and governance (ESG) metrics to analyze an organization’s ethical impact and sustainability practices” (Spiliakos, 2018). In their evaluation and consequent company’s selection, investors take into consideration specific aspects as “company’s carbon footprint, water usage, community development efforts, and board diversity” in order to choose among alternatives (Spiliakos, 2018).

Moreover, implementation of sustainable strategies may improve financial performance while raising public support (Spiliakos, 2018). As a result, companies should embrace such direction,

reassured that sustainability efforts would keep the business profitable, even by strengthening it (Spiliakos, 2018).

The sustainability challenges can be articulated and classified according to the *triple bottom line*, relating to social, environmental, and economic aspects (Franco et al., 2020). Here, the most relevant are mentioned: preserving employees' well-being and improving the quality of life, protecting society's well-being and stakeholders' interests; preserving natural resources, as well as developing new practices to restore and regenerate ecosystems (Franco et al., 2020). Technological innovation is required to uncover new types of sustainable natural resources or create alternatives (Franco et al., 2020). Specific investments in innovation and research are needed to switch toward circular economy and fuel a real paradigm shift, which requires adaptation and change of current models (Franco et al., 2020).

1.2 Circular Economy and its applications

Circular economy is defined as a production and consumption model, which is focused on reusing, repairing, refurbishing, and recycling existing materials and products ("Circular economy: definition, importance and benefits", 2022). Its leading purpose is extending the product's life cycle and reducing waste generated by each stage of the supply chain ("Circular economy: definition, importance and benefits", 2022).

After a product reaches the end-of-life, its materials can be productively reused, in turn creating additional value. ("Circular economy: definition, importance and benefits", 2022).

In contrast to the traditional *linear* economic model, based on a "take-make-consume-throw away pattern" ("Circular economy: definition, importance and benefits", 2022), the circular economy model is based on a closed "procurement-production-consumption loop". It requires systematic change throughout the value chain, which entails establishing new partnerships, innovative product design and business models, closed-loop approaches to make waste into resources ("Circular economy: definition, importance and benefits", 2022). In fact, Circular Economy has the purpose to maximize product lifecycle, throughout all steps of the value chain: new business models, coupled to an organizational and cultural shift, are necessary to effectively implement it (Mishra et al., 2021).

This transition can be bottom-up or top-down, as a consequence of national political strategy or resulting from organizations' action (Mishra et al., 2021).

Potential actions for firms who want to embrace such change are available. Collaboration with partners, not operating alone but engaging in a network, in order to gain experience and

learning when communicating with other stakeholders, investing in innovation, implementing a waste management system, connecting customers, and changing utilization patterns (Mishra et al., 2021) are some examples.

On the one side, in order to reduce *post-production waste*, fashion firms can take on cleaner production methods, which include actions to reduce pollution and use of toxic substances, as well as specific design for the environment (Mishra et al., 2021).

On the other, they may incentivize on-demand production systems to reduce *pre-consumer waste*, which implies producing the exact demanded quantities, when needed.

Instead, *post-consumer waste* includes any out of fashion apparel that is discarded and no longer used by the consumer (Mishra et al., 2021). In order to control it, fashion companies can expand their scope to the end-of-life phases of their products, by managing reuse or resell platforms and return management services for reuse and recycling (Mishra et al., 2021).

For instance, *Stella McCartney* is developing innovative practices to reuse recycled nylon and polyester, and regenerated cashmere (Pereira, 2020). Moreover, the luxury brand is also investing in “restorative farming practices to ensure the regeneration of natural sources” (Pereira, 2020): this consists of using organic cotton and sustainable sourcing of viscose (Pereira, 2020).

When turning the attention to the Food industry, the fast-food chain *Burger's King* is currently considering the use of reusable containers for sandwiches and drinks in New York, Portland, and Tokyo (Mazzoni, 2020). Consumers would pay a deposit for their use, which will be returned with the containers, once used (Mazzoni, 2020).

Instead, *Ikea* launched a furniture buyback project in 2020, where consumers can get up to 50% of the product's initial price as a voucher (Mazzoni, 2020).

The tech colossal *HP* showed to be extremely sensible to ocean health and engaged in the use of recycled and ocean-bound plastics, by launching the first desktops and computers made of such materials (Mazzoni, 2020).

In conclusion, Circular Economy success must be coupled to a responsible and more conscious consumer purchasing behavior: fashion companies are responsible to educate consumers, in order to develop awareness on their purchasing, usage and discarding habits' impacts (Mishra et al., 2021).

1.3 Corporate Social Responsibility: definitions and practical implications

Corporate social responsibility (CSR) is a “self-regulating business model” which allows a company “to be socially accountable to itself, its stakeholders, and the public” (Fernando, 2021). By implementing CSR practices, companies can become aware of the impact they are having on society, from the usual three perspectives of economy, society, and environment (Fernando, 2021).

In fact, engaging in CSR means that a company is operating with the objective of enhancing and positively sustaining society and the environment, instead of negatively affecting them (Fernando, 2021). In this way, a business will work in order to create long-term, good value for the whole global community. The idea is that companies can “benefit society while boosting their brands” (Fernando, 2021), in turn pursuing also socially oriented objectives, other than profit maximization (Fernando, 2021).

Furthermore, CSR activities can be useful to strengthen the bond with employees and customers, boost morale, and make both employees and employers more connected to the ecosystem around them (Fernando, 2021). Examples of such activities are ethical and cleaner production, no tests on animals, eco-friendly packaging, traceability, use of recycled materials. The reason for embracing such a direction of change lies in a positive effect on brand reputation, as customers would be more willing to purchase from companies they perceive as ethical and deeply involved in CSR practices (Fernando, 2021). As a result, CSR would ensure a better customer engagement and consequent trust generation.

For example, *Gucci* is currently performing and investing in a complete integration of CSR activities in its core strategy and operating processes (Bonacchi et al., 2012). The luxury Italian brand’s future objectives in such direction consider expanding the sustainability’s scope, creating a deeper involvement with stakeholders, and improving the transparency of internal and external communication, in order to raise awareness throughout all organizational levels (Bonacchi et al., 2012). Moreover, *Gucci* is known for its top-down approach in CSR implementation, a sign of strong top management commitment (Bonacchi et al., 2012).

Gucci’s mission and vision are articulated around the concept of *sustainable value creation*, which is characterized by human and employees’ rights protection, equal opportunities, health and safety concern, social and environmental standards along the supply chain, transparent reporting, promotion of communities’ development, process redesign with attention to the environment (Bonacchi et al., 2012).

Moreover, Gucci recognizes CSR and sustainability as strong competitive factors and elements of differentiation in a globalized market (Bonacchi et al., 2012).

From an organizational viewpoint, dedicate CSR units have been designed, which are assigned with a budget, in order to accomplish the given results (Bonacchi et al., 2012).

Gucci is determined to build a measurement system, able to compute, check and “report stakeholders’ performance and satisfaction” (Bonacchi et al., 2012). It would be relevant for remuneration system, objectives’ definition, progress’ monitoring, periodical check, and careers progression (Bonacchi et al., 2012).

Rather considering the Food industry, another example of business with a positive impact on society is the premium ice-cream producer *Ben & Jerry’s* (Gavin, 2019). In fact, the company has been awarded with the title “certified B corporation”, for “meeting the highest standards of social and environmental performance, public transparency, and legal accountability”, in turn reaching a balance between profit and purpose (Gavin, 2019). Moreover, Ben & Jerry’s Foundation has been set up in 1985, in order to support grassroots movements, struggling for human rights protection, environmental health and justice (Gavin, 2019).

Also, *Starbucks* released its first CSR report in 2002, with particular emphasis on ethical sourcing efforts (Gavin, 2019). In fact, the brand is certified with CAFE (Coffee and Farmer Equity) for preserving a positive social impact while sourcing its coffee (Gavin, 2019) and it was recently named as one of the most ethical companies in the world (Gavin, 2019).

2. Textile Industry: challenges and future sustainable actions

The supply chain of fashion companies is complex, made of several phases, including “design, raw material harvesting, spinning, yarn production, dyeing, weaving, cutting, stitching and final garment construction” (Mukherjee, 2015), involving both traditional and innovative, high-tech processes (Mukherjee, 2015). Moreover, Textile industry is considered the second largest global economy, both in terms of production activities, which are spread across geographical boundaries, and as a “functional integration between internationally dispersed activities” (Mukherjee, 2015).

People agree that Fashion industry is among the main players in charge for negative impacts on the environment and society at large. The most relevant environmental issues associated to fashion are resource consumption throughout the supply chain, being mainly fossil fuels and water; air polluting and emission of dangerous substances, depending on the type of fabric and process; land use “and degradation that can come from chemical pollution of soil and groundwater through use of herbicides, insecticides and fertilisers, and loss of biodiversity.” (Mukherjee, 2015).

Moreover, recorded data show that 73% of textiles are “disposed in a landfill or incinerated, 12% are production losses, 14% are collected for recycling in lower-value applications such as mattress stuffing or insulation material and less than 1% is used to produce new textiles.” (Luján-Ornelas et al., 2020). These figures stress out a lack of effective recollection and recycling strategies. In fact, the composition of fibers used in such processes makes their separation and recycling quite hard (Luján-Ornelas et al., 2020). Here the importance of shifting from the current linear model to a more sustainable closed-loop one.

Last decades saw a global increase of clothing production and consumption, close to 60%, coupled to a decrease of clothes’ useful life (Luján-Ornelas et al., 2020). This is commonly considered a direct consequence of Fast Fashion business model, which may be defined as “a business model that combines three elements: (a) quick response; (b) frequent assortment changes; and (c) fashionable designs at affordable price” (Luján-Ornelas et al., 2020). In practical terms, this can be translated into shorter useful life of clothes, worse quality, greater resources’ consumption, and heavy waste generation within the supply chain (Luján-Ornelas et al., 2020).

2.1 Environmental impact associated to the textile supply chain

When considering and evaluating the garments' manufacturing process, fibers and the associated trade-offs must be taken into analysis firstly. They can be natural, as wool, silk, land cotton, or artificial, which means synthetically obtained from petrochemicals (Mukherjee, 2015).

Man-made fibers are the best substitutes to prevent natural resources' depletion (Mukherjee, 2015). However, their manufacturing processes are polluting, and they are hard to recycle (Mukherjee, 2015). As in the case of polyester, it involves "an energy-intensive process requiring large amounts of crude oil and releasing emissions" (Mukherjee, 2015). Moreover, "Volatile monomers, solvents, and other by-products of polyester production are emitted in the wastewater from polyester manufacturing plants" (Mukherjee, 2015). In addition, some of those artificial fibers contribute to deforestation and pollution in developing countries.

In contrast, *natural fibers* like cotton are responsible for more than 10% and 25% of the world's total consumption of pesticides and insecticides respectively, together with an intensive water consumption to irrigate crops (Mukherjee, 2015).

Another relevant problem is associated to *air pollution*. In fact, emissions are generated by almost all phases of the supply chain. Hydrocarbons, formaldehyde, acids, softeners are only some of the most dangerous substances released by textile processes (Mukherjee, 2015).

Also, residuals from fibers' preparation may cause polluting emissions in heat setting processes (Mukherjee, 2015). Acetic acid and formaldehyde are the most impacting and relevant emission for the textile industry (Mukherjee, 2015).

In addition, *water* is not only over-used (1 kg of textiles require 200 liters of water), but large volumes of chemicals are used throughout the processes, and they are responsible for its contamination (Mukherjee, 2015).

Once purchased, clothes stay at home, as part of the wardrobe, but in reality, they constitute a "*latent waste*": in fact, once got at the end of their life, or the seasonal trends change, as a result of obsolescence and consumerism, they are discarded, becoming part of the "solid waste stream" (Mukherjee, 2015).

In conclusion, transport, distribution, and retail packaging, play a role in terms of environmental impact (Mukherjee, 2015). It is common that firms exceed with packaging

materials to boost product's visibility (Mukherjee, 2015), without having effects on product's serviceability.

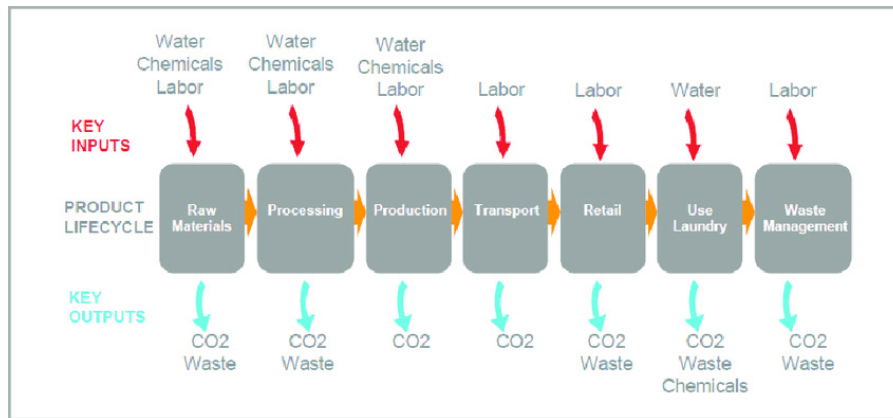


Figure 1: *Stages of the textile product life cycle and impacts; Source: Pruzan-Jorgensen P. M., Sustainability in the European Apparel and Textile Industry, 2010 EURATEX General Assembly, June 10, 2010.*

2.2 Social impact of Fashion

When talking about social impact of Textile industry, authors commonly refer to indecent work, gender inequality, poor working conditions, under-minimum wages and several other issues having a negative outcome on society (Mukherjee, 2015).

Over the years, with the advent of Fast Fashion, quality requirements have significantly decreased their standards, resulting in fashion companies cutting production costs, in order to ensure lower prices and quicker time to market (Mukherjee, 2015). This aspect had an impact on wages and *workers' rights*: they are subject to intense working hours and schedules, especially during peak seasons, to respect delivery times strictly (Mukherjee, 2015). However, they did not see any wage payment's increase in reflection (Mukherjee, 2015).

Instead, *working conditions* are still terrible, constituting a risk for people's health and safety (Mukherjee, 2015).

Moreover, the seasonal nature of fashion demand made firms performing "just-in-time recruitments", as it was too expensive to keep and maintain a fixed workforce (Mukherjee, 2015). In this way, they can enjoy greater flexibility and lower fixed costs, following concrete production requirements (Mukherjee, 2015).

As a consequence of their "docility, lesser bargaining power and easy retrenchibility" (Mukherjee, 2015), women were soon included into the firm's workforce, together with

children. They are often assigned to specific, alienating, lesser paid tasks, experiencing wage discrimination with respect to men, who instead enjoy power positions (Mukherjee, 2015). Moreover, powerless women often suffer from physical and mental violence within their working environment (Mukherjee, 2015).

2.3 Sustainable Fashion and its impact on consumer behavior

As a response to environmental and social degradation, the concept of *Slow Fashion* may represent a solid opportunity to mitigate current harmful and unsustainable consumption habits. It is a “conscious movement” (Luján-Ornelas et al., 2020), aimed to deliver better quality garments, outcomes of a sustainable supply chain, with a longer lifetime and a lower purchasing frequency (Luján-Ornelas et al., 2020). It emerged in the 1960s as a response to new customers’ needs, who became aware of the environmental impact of clothing manufacturing and asked for a change (Henninger, C., 2016). It is centered around the importance of worker’s empowerment and a balanced fashion production, “which fosters long-term relationships, builds local production, and focusses on transparency” (Henninger, C., 2016). Slow fashion keywords, through which it is identified, are “*local production, traditional values, ecosystem preservation, diversity of sources, and responsible approach*” (Štefko et al., 2018).

In general, highly involved “slow” customers are willing to pay a price premium of 20-25%, in exchange for consistent degree of transparency, especially on product’ origins (Štefko et al., 2018). In a complementary way, Slow Fashion cannot compete on production costs, which are far higher than Fast Fashion’s ones, due to the higher quality level (Štefko et al., 2018).

Moreover, this new concept of Fashion focuses its attention on creativity to express an individual, personal style, instead of just following a trend (Štefko et al., 2018). It is treated as a mean of “self-expression not only from the point of view of designers, but also from the perspective of consumers” (Štefko et al., 2018).

In addition, consumers are directly involved as an active part of the textile supply chain: “firms should provide sufficient sustainability information for consumers, in order to encourage all consumers to be environmentally conscious.” (Shen et al., 2017). A challenge may be an effective and persuasive communication of all benefits coming from sustainable fashion, in order to “increase buy-in within the mainstream fashion landscape.” (Henninger, C., 2016).

Concerning the impact of Sustainable Fashion on consumer behavior, research shows that it was negatively perceived before the 1990s, as people believed this new concept was in contrast

with the essence of fashion (Mandarić et al., 2022). Moreover, the promotion of green products by fashion companies may still be misleading for customers, and in turn associated to greenwashing, whenever these firms keep their traditional business models alive (Mandarić et al., 2022).

Thereafter, it is important to mention the so called “*attitude-behavior gap*”, which is defined as a “paradox between increased acceptance of sustainable fashion and lack of actual purchasing behaviour” (Mandarić et al., 2022). In turn, this means that a positive environmental perception does not always become concrete action, and it explains why 50% of European consumers seem to be willing to pay more for sustainability, but green products have less than 1% market share (Mandarić et al., 2022).

Another possible explanation to this scarce adoption of sustainable products lays in the presence of some prevailing drivers of consumer purchasing decision, being price, value, trends, and fashion brand image (Mandarić et al., 2022), while sustainability still covers the lowest positions as a buying criterion (Mandarić et al., 2022). Many fashion consumers believe clothing constitutes a mean of self-expression, so “their motivation to be trendy often prevails over their motivation for ethical or sustainable fashion purchases” (Mandarić et al., 2022). This is translated into an internal conflict between the desire to consume and the attempt to reduce it (Mandarić et al., 2022).

Nevertheless, there may be a slice of fashion consumers who developed a deep social and environmental awareness and are concerned about the behaviour of their fellows (Mandarić et al., 2022). However, even these attentive consumers often experience a contrast between the “the desire to be fashionable and the desire to reduce overall consumption” (Mandarić et al., 2022), resulting in a final decision of not buying, instead of buying green. They may constitute the potential starting point for a change, but there are still barriers to be defeated (Mandarić et al., 2022). One of them is the lack of knowledge about fashion industry’s social and environmental impacts: in fact, the level of such concern cannot be considered sufficient to drive sustainable apparel purchasing (Mandarić et al., 2022). The scarce consumer’s knowledge may be another explanation to the attitude-behavior gap (Mandarić et al., 2022).

Fashion companies must develop effective communication and marketing campaigns to raise awareness, to explain the meaning of sustainability and the crushing side of the business, in order to accomplish real consumers’ behavioral changes (Mandarić et al., 2022).

To conclude, it is necessary to embed and integrate sustainability practices into the textile and apparel supply chains, in order to ensure superior value creation (Shen et al., 2017). This is

possible through cooperation with multiple stakeholders: collaboration supports sustainability implementation, and it is beneficial to reduce barriers (Shen et al., 2017). The associated pressure from external stakeholders can “support proactive changes and supply chain visibility.” (Shen et al., 2017).

2.4 Sustainable business models in the Fashion Industry

As a response to an increased interest for green products and a spread awareness among consumers, several fashion brands and retailers, as H&M and Zara, have heavily invested in sustainability to develop new business models (Todeschini et al., 2017).

Five main sources of external pressure and change drivers may be identified (Todeschini et al., 2017).

At first, the development of a new *consumer awareness* is considered the main behavioral change, expressed through “lowsumerism and slow fashion” which have a direct impact on fashion business models (Todeschini et al., 2017). Then, the trend of *Circular Economy*, presented in Chapter 1, gives rise to a new paradigm and leaves room to innovation in products, services, and business models (Todeschini et al., 2017). Moreover, many *CSR initiatives* have been undertaken by fashion brands, consequently to fair trade movements, struggling to obtain fair wages and better working conditions (Todeschini et al., 2017). Examples of such initiatives are sustainability reports, monitoring, auditing, codes of conduct and labor standards assurance programs, supplier disclosure and transparency practices (Todeschini et al., 2017). In addition, the emergence of *sharing economy and collaborative consumption* must be mentioned, which “promote economic growth based on innovation and entrepreneurship and mitigate environmental impacts associated with large-scale production” (Todeschini et al., 2017). In the end, sustainability in fashion is enabled by the use of *technological innovations*, such as additive manufacturing, augmented reality, wearable technologies, useful to “best detect when and how to discard garments” (Todeschini et al., 2017). These five factors are responsible for companies’ change actions and redesign strategies, in order to develop new ways of doing business, completely focused on sustainability (Todeschini et al., 2017).

The role of technology as a driver of sustainable innovation in fashion may be exemplified with two cases of Italian fashion startups, being *Orange Fiber* and *Lanieri*. The first bases its business on reusing the waste from citrus juice byproducts, which is transformed into cellulose fibers to create an innovative fabric (Todeschini et al., 2017). The second is an online platform

of customized, made-to-measure men clothes, which uses a 3D configurator and augmented reality features to manage customer's measurements (Todeschini et al., 2017).

In order to ensure the success of these sustainability-based business models, fashion firms should concentrate their efforts on *CSR practices* and their communication, as consumers may be influenced when purchasing (Todeschini et al., 2017). Moreover, the shift to “*service-based business models*” may help to reduce stock requirements and give up any production activity (Todeschini et al., 2017). Another critical aspect of success is the presence of a *supporting business ecosystem*, made of partners, shared values and knowledge sharing (Todeschini et al., 2017). This may help the creation of synergies and collaboration, essential to “foster business model experimentation” and diffusion (Todeschini et al., 2017).

An example of a successful sustainable business model has been developed by *Patagonia* in the past years, a sportswear brand selling sustainable outdoor clothes. Such products embed the brand's philosophy of environmental responsibility, based on its willingness to “manufacture, repair and recycle products in order that they last a lifetime” (Hoang, 2017). Precisely animated by this purpose, Patagonia is embracing the direction of circularity and closed-loop processes, by designing more durable items, with an extended life cycle, by engaging in recycling and repairing practices, and by reducing the environmental impacts of the upstream phases (Hoang, 2017). Moreover, Patagonia put in place effective communication campaigns: “we engage with our customers because it's a relationship. They need to understand that, as a brand, we are invested in this responsibility for the product from end to end and we are going to help them in each stage of the process” (Hoang, 2017).

In conclusion, some challenges, which act as barriers to the development of innovative, sustainable business models, may come to play. The concretization of sustainability principles into a value proposition is heavily impacted by the *product design phase*, in which the adoption of eco-friendly materials and sustainable production processes is determined (Todeschini et al., 2017). This phase is complex and deals with technical constraints, as those related to the use of recycled materials; it requires a great amount of design thinking and creativity (Todeschini et al., 2017).

Consumer education may become an obstacle as well. It must work to convince consumers that traditional linear models and practices cannot succeed anymore, in turn orienting them toward “more sustainable consumption behaviors” (Todeschini et al., 2017). Tightly linked to it, there are *consumer expectations* about sustainable business models: if too high, they may not be

satisfactory addressed by fashion companies, having a negative effect on their image and perception (Todeschini et al., 2017).

The last issue comes from the need for collaboration and stakeholders' commitment. Even if knowledge sharing brings benefits in terms of cost reduction and better performance, *collaborative efforts* are complex and challenging for the participating firms (Todeschini et al., 2017). Indeed, conflicts have not only a technical nature, but also “misaligned organizational values can derail efforts to effectively engage in strategic partnerships” (Todeschini et al., 2017).

3. How companies react to Sustainability

It is commonly known that companies need to outperform their rivals in many performance drivers, in order to establish a solid competitive advantage and win the game (Shahbazzpour et al., 2006). Standard firms' performance objectives include lowering production and distribution costs, meeting market demand and requested quality levels, being able to deliver products of superior technology and performance, ensuring fast delivery times, promptly responding to customer orders, "proactive response to changes in production mix and volume", customization and innovation of products and processes (Shahbazzpour et al., 2006).

Nowadays, the influence of sustainability on such objectives must be taken into account, being the *generator of new trade-offs and strategies* to be managed (Shahbazzpour et al., 2006).

As a result, firms must respond to a request for more customized and personalized products, limiting natural resources' consumption, in light of more environmentally conscious consumers (Shahbazzpour et al., 2006). These external forces brought sustainability to be one of the main manufacturing objectives (Shahbazzpour et al., 2006).

Importance of sustainability highly depends on the specific market, society or industry: it may be an essential driver for a firm to be considered by its customers, or instead, as for developing countries, only a part of differentiation strategy (Shahbazzpour et al., 2006).

As a result, sustainability has become the engine for new strategies and future competitive advantage will be likely based on "a set of emerging capabilities such as waste minimisation, green product design, and technology cooperation in the developing world." (Shahbazzpour et al., 2006).

However, why may sustainability be *source of constraints* for a firm?

There may be chance of conflict between sustainability practices and other manufacturing objectives (Shahbazzpour et al., 2006). These trade-offs can be related to quality, "if reducing waste, energy usage or other environmental impacts of the production processes results in defective or less capable products" (Shahbazzpour et al., 2006); cost, even if those investments in sustainable initiatives generally ensure quick payback times; delivery time, if lead times increase or deliveries get unreliable; flexibility, whenever sustainability has negative impacts on a firm's fast reaction to change (Shahbazzpour et al., 2006).

Understanding the root-cause or the founding, contradicting relationship is essential to solve these manufacturing trade-offs (Shahbazzpour et al., 2006). It is crucial in order to make use of sustainability to build a strong competitive advantage, driving an improvement to enhance competitiveness and superior value creation (Shahbazzpour et al., 2006).

3.1 CSR and the strategic need of its business integration

The strategic need to integrate CSR practices into firms' core business has been driven by some external pressures: a surprising public reaction and a grown sensitivity to environmental and social issues, which saw, for instance, consumer boycotts against NIKE, protests for unacceptable working conditions, fast-food and packaged companies held responsible for obesity (Porter et al., 2006).

Now, why CSR practices gained such importance?

Firstly, it is a matter of *legitimation*, known as the “desire to improve suitability of the firm's actions within an established set of regulations, norms and values” (Shahbazzpour et al., 2006). Secondly, there is a concern for *social obligations* because firms perceive themselves as functional entities, within a macro environment, and feel a kind of moral responsibility (Shahbazzpour et al., 2006).

Thirdly, companies want to protect their *inimitability* and thus superior profitability: the long-term competitive advantage can be established and preserved thanks to CSR practices' implementation (Shahbazzpour et al., 2006).

In the end, the impact of sustainability on *brand's image*, *stock value* and *reputation* play a role in determining such importance (Porter et al., 2006).

How do firms react to the need for CSR implementation?

The most common response is neither operational nor strategic, but it involves “public relations and media campaigns”, often aimed to promote “glossy CSR reports” and show companies' good practices (Porter et al., 2006). Those sustainability reports are incoherent and depict a set of uncoordinated initiatives, completely disconnected from the core business and strategy, just to show firms' social sensitivity and gain some positive reputation (Porter et al., 2006).

It is clear that a new practical approach is required, with a more effective integration of social considerations into the business operations (Porter et al., 2006). Indeed, Porter and Kramer (2006) highlight that “when looked at strategically, corporate social responsibility can become a source of tremendous social progress, as the business applies its considerable resources, expertise, and insights to activities that benefit society.”

A common mistake may be that companies concentrate on business-society contrast, while overlooking their *tight interconnection*: in fact, they need each other to maximize performance, showing high degree of mutual cooperation (Porter et al., 2006).

“Successful corporations need a healthy society” (Porter et al., 2006). This includes ensuring proper education, health care systems and equal opportunities, essential for a productive workforce (Porter et al., 2006). Moreover, safe products and decent working conditions attract customers and ensure lower accidents’ frequency (Porter et al., 2006).

Another aspect of this crucial business-society interplay is that “efficient utilization of land, water, energy, and other natural resources makes business more productive” (Porter et al., 2006). In their turn, efficiency and innovation require rules, functioning governments and strong regulatory standards (Porter et al., 2006). In the end, a healthy, well-functioning society is the source of a growing demand, even more if expectations are constantly met by firms’ actions (Porter et al., 2006). In this regard, Porter and Kramer (2006) state that “any business that pursues its ends at the expense of the society in which it operates will find its success to be illusory and ultimately temporary.”

On the other side, society needs profitable companies. If governments or other stakeholders within civil society contrast firms’ business, they may cause corporate and regional competitiveness reduction, resulting in not-ascending wages and jobs loss (Porter et al., 2006).

In summary, companies impact societal environment and local communities with all activities of their supply chains, creating *inside-out* linkages (Porter et al., 2006). Complementary, external forces influence companies’ actions with opposite *outside-in* linkages (Porter et al., 2006). As a result, a company’s final objective is to identify the intersection point of these two directions and build long-term shared value (Porter et al., 2006).

In order to find such synthesis, companies need to “categorize and rank” (Porter et al., 2006) social and environmental issues to be addressed, and finally select the most suitable ones (Porter et al., 2006). In fact, Porter and Kramer (2006) claim that the more a social issue fits into a company’s business, the greater benefits are generated, leveraging on firm’s resources.

Furthermore, CSR implementation brings a *holistic revolution* within the firm’s environment, which triggers profound changes to the organizational structure and its mindset, together with its leadership and incentives systems (Porter et al., 2006). In order to shift successfully, companies must adopt an integrated approach and give up the fragmented one (Porter et al., 2006).

In conclusion, a *strategic use* of CSR means choosing uniqueness and inimitability to grant business benefits and concrete impacts, through a proper combination of inside-out and

outside-in actions, outcome of business-society interconnection (Porter et al., 2006). At this point, “the success of the company and the success of the community become mutually reinforcing” and value chain innovations are coupled to investments in the competitive context, with “the potential to reduce constraints on a company’s value chain activities” (Porter et al., 2006).

3.2 The role of transparency and communication to create consumer awareness

Supply chains need to be transparent, which implies being visible and disclosed, where data are properly and accurately collected from all the sources (Beijk, 2021). This is translated for firms into “the ability to track the origins of products and services, thereby providing full disclosure of the “carbon footprint” and “human labour footprint” associated with products.” (Beijk, 2021). However, given the complexity and the global dispersion which characterize the fashion supply chain, these firms find it hard to collect such amount of information.

Visibility of the supply chain became highly important over the years, together with the participation of the firm’s network of stakeholders in “knowledge sharing and awareness increasing” (Brun et al., 2020).

As a reaction to the growing interest in green supply chain management, social and environmental dimensions became part of the relevant content to be shared and communicated externally.

Provided that sustainability goes beyond firm’s boundaries, it is important to consider all relationships along the supply chain and collaboration among all actors involved (Brun et al., 2020). In turn, companies must develop strategies of supplier engagement, commitment and leadership, as they constitute the basement to supply chain transparency (Brun et al., 2020). Indeed, this *stakeholders’ holistic commitment* is critic to spread sustainability across the network and raise consumer’s awareness (Brun et al., 2020).

Moreover, transparent communication constitutes the basis for CSR implementation, and it may be beneficial to reduce the risk of skepticism among customers (Kim et al., 2018).

When referring to companies’ transparent communication, this may be defined as the “deliberate attempt to make available all legally releasable information, whether positive or negative in nature, in a manner that is accurate, timely, balanced, and unequivocal, for the purpose of enhancing the reasoning ability of publics and holding organizations accountable for their actions, policies, and practices.” (Kim et al., 2018). By communicating a true CSR

motive effectively and transparently, a firm would be able to generate trust, organizational commitment, collaboration, and build employees' relationships (Kim et al., 2018).

In addition, Kim and Lee (2018) suggest that transparency has a moderating role in CSR communication, by enhancing "the trustworthiness of an organization's CSR initiative", even if the selected social cause does not fit properly with the company (Kim et al., 2018).

How can companies ensure such effective, transparent communication?

In general, companies' communication efforts should not be mono-directional and limited to an informative action, but they must influence individuals, create social engagement and action, which entails boosting "societal transformation towards the normative goals of sustainable development." (Beijk, 2021). This can be done effectively with *two-way communication*, which is a bidirectional flow of information between companies and customers (Beijk, 2021).

Social media as communication tools come to play. They ensure a better fit with two-way communication systems and generate reliability among consumers (Beijk, 2021). Moreover, they are able to create a feeling of interpersonal relationship, which works to drive the environmental behavior, and they grant quickness and easiness of use (Beijk, 2021).

"Social media is increasingly important as a medium for companies to convey a message linking a company to solving global goals" (Beijk, 2021), with the ability to raise consumer awareness and engagement.

3.3 The challenge of Greenwashing

Transparent communication of CSR initiatives and actions plays a role also in lowering the widespread, negative skepticism among customers, result of fake declarations concerning sustainable practices (Kim et al., 2018).

In fact, customers have become progressively aware and more sensitive to the impacts of their purchasing choices. In turn, companies have been forced to adapt their offerings to this new "green" demand (Beijk, 2021).

However, creating such sustainable products involve costs and risks, to completely redesign their structure and design (Beijk, 2021). This is the reason why it is "easier for companies to take part in greenwashing, than to completely change their products." (Beijk, 2021).

Greenwashing means misleading consumers about the sustainable, environmental, and social actions of a firm, by adapting the firm's communication campaigns and messages to meet their "green" expectations (Beijk, 2021). As such, consumers are convinced to buy products with environmental benefits, but reality is far different (Beijk, 2021).

The problem is that greenwashing practices negatively impact firms' reputation, as well as consumer's confidence in green products: as a result, this part of demand for sustainability collapses (Beijk, 2021).

When it is reasonable to say that a fashion company is “greenwashing”?

A potential signal may be when a firm engages in impressive initiatives to control and lower carbon emissions only at the head office, instead of throughout the whole supply chain. (Rauturier, 2022). Another alarm sign may be the firm's promotion of “eco-friendly packaging” as the leading strategy, without changing far more impacting factors of its business model (Rauturier, 2022). Moreover, fashion companies often talk about energy efficiency and minimum wage, but the latter is still far away from the amount of money needed by employees to live decently (Rauturier, 2022). In the end, it is common to see fashion brands launching eco and sustainable ranges or collections, which however constitute only a tiny slice of their total production (Rauturier, 2022).

Some examples of fashion brands doing greenwashing are SHEIN, a Chinese retailer, H&M, ASOS and ZARA (Rauturier, 2022).

It is clear why companies must tell the truth about their sustainability actions, using two-way communication to engage customers, as “people are not a passive part of the environmental problem but can become an active part of the solution”, shaping brand's confidence and integrity (Beijk, 2021).

3.4 Definition and classification of eco-labels

Eco-labels mainly constitute a response to changes in consumer behavior and to the raise of “green consumerism”, known as the set of purchasing decisions made by consumers, guided by environmental or social criteria (Galarraga Gallastegui, 2002). Consumers are more aware and sensible to environmental and social challenges, resulting into a higher demand for green products. Particularly, these customers want to be informed about all processes involved through the supply chain, in terms of impacts (Galarraga Gallastegui, 2002).

“Eco-labelling seeks to inform consumers about the effects on the environment of the production, consumption and waste phases of the products/services consumed.” (Galarraga Gallastegui, 2002). The main purpose is to give customers information about the impacts of their consumption, and also to make governments and other entities raise the environmental standards of their products (Galarraga Gallastegui, 2002). In addition, eco-labels allow firms

to measure products' environmental performance from a life-cycle perspective; in addition, they may reduce information asymmetries and the gap between consumer willingness to pay and the price set by the producer (Galarraga Gallastegui, 2002).

Textile and clothing industry, with respect to other fields, is employing all possible CSR tools to report and inform buyers about their manufacturing processes (Koszewska, 2011). Fashion firms follow specific reporting guidelines and external organizations are invited to audit them, to ensure more credibility (Koszewska, 2011). Social and environmental reports are communication tools for company's internal and external stakeholders but also a support for management, "allowing companies to structure their approach to sustainable development, progress measurement, formulation of strategies and improvement goals." (Koszewska, 2011). Moreover, clothing firms are committed to providing consumers with more publications, online information services and consumer guides, as "Ethical Consumer, Ethiscore, Newconsumer, Lift the Label Ethical Directory, and Getethical, which contain a wealth of information on apparel stores, ethical fashion, organic cotton, fair trade, etc." (Koszewska, 2011).

In the meanwhile, a growing number of fashion firms is applying for process certification by third parties to label their products, in addition to standard labels, which provide general information on raw materials and product's origins (Koszewska, 2011).

Labelling and certification systems can be classified according to territorial coverage, as national Germany's *Blue Angel*, supranational *EU Ecolabel*, or international *Fair Trade*, or by thematic scope, which means according to the type of products covered by a label (Koszewska, 2011).

Some international organizations, as the European Community, World Trade Organisation (WTO), United Nations Environmental Programme (UNEP) and the International Organisation for Standardisation (ISO), jointly created a set of eco-certification rules, resulting in many initiatives of sustainable products' certification during the last 30 years (Koszewska, 2011). The International Organization for standardization released a series of standards to ensure a unified approach, including *ISO 14020*, *ISO 14021*, *ISO 14024*, *ISO 14025* (Koszewska, 2011). ISO classification provides for three types of information about environmental impact of a product or service; in turn three types of ISO eco-labels have been developed with related standards (Koszewska, 2011).

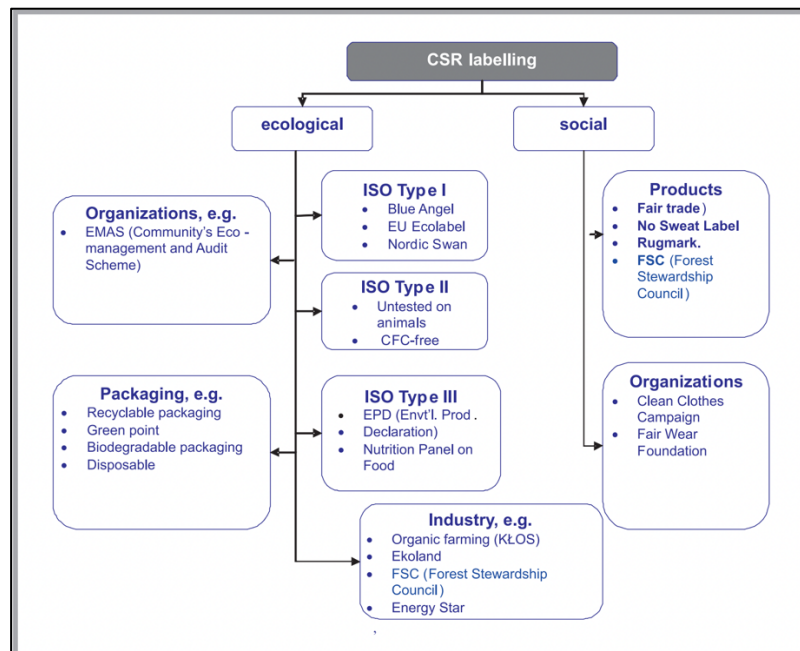


Figure 2: Classification of CSR labels; Source: “Social and Eco-labelling of Textile and Clothing Goods as Means of Communication and Product Differentiation”

- **Type 1:** such labels “refer to the environmental quality of a product compared with the rest of the products” and they have the function to drive a switch towards more environmentally friendly consumption practices (Galarraga Gallastegui, 2002). They are voluntary and need third party certification; examples are the Blue Angel (Germany) and the EU eco-label. They want to identify the less impacting products, adopting a life cycle approach (Galarraga Gallastegui, 2002)
- **Type 2:** these are environmental claims made by manufacturers and distributors about specific features of the product (Galarraga Gallastegui, 2002).
- **Type 3:** labels of this type provide “quantified information about products based on independent verification” (Galarraga Gallastegui, 2002), but there is little experience about them.

Figure 3 summarizes the main features for each label type mentioned above. It contains information about the related ISO standard, if third parties are involved or not, the use of a life cycle analysis, the scope, if the label is voluntary, the level of verifiability and reliability and the possible prospects for development.

Type	Eco-labelling		
	Type I	Type II	Type III
Standard	ISO 14024	ISO 14021	ISO 14025
Third party involvement	yes	no	yes
Life cycle analysis	simplified	no	yes
Scope	multi-criterial	selected product traits	parameter categories defined for the sector
Possibility of differentiating products ecologically within a group of products	yes	no	yes
Information carrier	a label – graphic mark, logo	graphic mark / word/slogan	numerical data represented by graphs, drawings, text
Voluntary	yes	yes	yes
Verifiability/reliability	high	low	high
Prospects for development	good	weak (low reliability)	average (complex procedure, analysis of a large volume of data)

Figure 3: Comparison of ISO labels; Source: “Social and Eco-labelling of Textile and Clothing Goods as Means of Communication and Product Differentiation”

Other types of labels include *industry labelling*, which is clearly industry specific, *corporate labelling*, used by firms selling or manufacturing products, *package labelling*, related to the external part of the product, and *social labelling*, which “primarily shows the organisation’s respect for workers’ rights, occupational safety and health rules, as well as its involvement in the well-being of local communities and in fair terms of trade.” (Koszewska, 2011).

Figure 4 shows the most popular eco-labels, providing a general overview.

German Blue Angel, promoting both environmental and consumer protection, is recognized to products positively affecting the environment, from a 360 degrees perspective, and with high occupational health and safety levels (Ecolabel Index, 2017).

EU Eco-label is voluntary and aimed to identify environmentally friendly products and services for European consumers (Ecolabel Index, 2017).

Nordic Ecolabel or Swan, available for 65 product groups, labels products defined as “good environmental choices” (Ecolabel Index, 2017).

EMAS, European Eco-Management and Audit Scheme, rewards “organisations that go beyond minimum legal compliance and continuously improve their environmental performance” (Ecolabel Index, 2017).

Label	Description	Logo	type
Blue Angel Germany	The Blue Angel is the first and oldest environmental label for products and services. It is a voluntary market-oriented instrument of environmental policy which has been designed to emphasise the positive environmental properties of products and services. About 10,000 products and services in 80 product categories carry the Blue Angel eco-label. ■ textiles categories (carrier bags, cleaning rags, handkerchiefs, mattresses, napkins, textile floor coverings) http://www.blauer-engel.de		ISO type I
EU Eco-label / EU Marguerite	The European Ecolabel is a voluntary scheme established in 1992 to encourage businesses to market products and services that are kinder to the environment. Products and services awarded the Ecolabel carry the flower logo, allowing consumers - including public and private buyers – to identify them easily. ■ textiles categories: textiles, Mattresses, shoes http://ec.europa.eu/environment/ecolabel/index_en.htm		ISO type I
Nordic Swan (Scandinavian countries)	Covers 66 different product groups ■ textiles categories (micro-fibre clothes and mops, textiles, skins and leather) http://www.svanen.nu/		ISO type I
	The Oeko-Tex® Standard 100 was introduced at the beginning of the 1990s in response to the general public's demand for textiles posing no health hazards. "Poison in textiles" and other negative headlines were common at that time and indiscriminately branded all chemicals used in textile manufacturing as negative and dangerous to health. http://www.oeko-tex.com/OekoTex100_PUBLIC/index.asp		Industry label for the textile industry
EMAS	The Eco-management and Audit Scheme EMAS is a European instrument that was implemented based on a Regulation of the European Parliament and Council to encourage different organisations (companies, plants, institutions, etc.) to keep improving their environmental performance. Being an EMAS member is equivalent to having a trademark showing that the organisation aims to be perfect. The basic EMAS principle is to distinguish and appreciate those organisations that exceed the minimum legal requirements and never cease to make efforts to improve their environmental performance.		Organization label

Figure 4: *The most common eco-labels, with a geographical classification; Source: “Social and Eco-labelling of Textile and Clothing Goods as Means of Communication and Product Differentiation”*

It is relevant to mention that numerous studies have been performed considering eco-labels in general terms. Instead, the analysis conducted in the second part of this thesis concentrates on certified eco-labels, “controlled and granted by a third party after assessment” (Rutten, 2022). Examples are ISO type 1 and 3, which require third party involvement. The main benefit provided to consumer is a more credible and reliable perception, with respect to the one of eco-labels produced within the fashion industry (Rutten, 2022).

For what concerns Textile industry specifically, *Figure 5* shows some popular eco-labels, both at product and company level.

The Global Organic Textile Standard (GOTS) is aimed to unify the existing standards and specify global requirements to ensure the use of organic textiles in all processes (Ecolabel Index, 2017).

The *Fairtrade* Mark is recognized as a registered certification for products meeting specific social, economic and environmental standards defined by Fairtrade itself (Ecolabel Index, 2017).

Name	Description	Logo
	Attached to specific products	
Fair trade	<p>The FAIRTRADE Mark is now the most widely recognised social and development label in the world. The FAIRTRADE Certification Mark is a registered trademark of Fairtrade Labelling Organisations International (FLO). It certifies that products meet the social, economic and environmental standards set by Fairtrade.</p> <p>The Mark certifies products not companies. It does not cover the companies or organisations selling the products</p> <p>textiles categories: cotton</p>	
Rugmark / GoodWeave™	<p>RugMark International e.V. (RMI) is an international non- governmental organisation working to end illegal child labour in the handmade rug industry and offer educational opportunities to children in India and Nepal. The GoodWeave certification label is issued to rug manufacturers that adhere to the RugMark standard, agree to its independent verification and voluntarily join RMI as licensees.</p>	
Global Organic Textile Standard	<p>This standard for organic textiles covers the production, processing, manufacturing, packaging, labelling, exportation, importation and distribution of all natural fibres. The final products may include, but are not limited to, fibre products, yarns, fabrics and clothes. The standards focus on compulsory criteria only.</p> <p>The aim of the standard is to define requirements to ensure the organic status of textiles, from the harvesting of the raw materials, through environmentally and socially responsible manufacturing, to labelling in order to provide a credible assurance to the end consumer.</p>	
Care & Fair-Siegel	<p>An initiative against illegal Child Labour and for the support of people working in carpet production in India, Nepal and Pakistan.</p>	

Fairtrade labelling organizations – labels applying to organisations and not products		
Fairtrade Organization Mark	<p>Introduced by the WFTO (formerly IFAT) in January 2004 during the World Social Forum in Mumbai in India. It is not used for product certification. The WFTO awards this sign to its trading members that meet standards specified in the WFTO monitoring system. Non-trading WFTO members and other organisations are not allowed to use the sign.</p>	
EFTA	<p>EFTA (the European Fair Trade Association) is an association of eleven Fair Trade importers in nine European countries (Austria, Belgium, France, Germany, Italy, The Netherlands, Spain, Switzerland and the United Kingdom). EFTA was established informally in 1987 by some of the oldest and largest Fair Trade importers. It gained formal status in 1990. EFTA is based in the Netherlands and has Dutch Articles of Association.</p>	
Clean Clothes Campaign	<p>The Clean Clothes Campaign is an alliance of organisations in 13 European countries. Members include trade unions and NGOs covering a broad spectrum of perspectives and interests, such as women's rights, consumer advocacy and poverty reduction.</p> <p>http://www.cleanclothes.org</p>	
Fair Wear Foundation	<p>FWF is an independent, not-for-profit foundation. Independence is guaranteed by a tripartite (multi-stakeholder) board, in which business associations, trade unions and (labour) NGOs are equally represented. Based in Amsterdam, FWF works internationally with companies all over Europe and in production countries worldwide.</p> <p>http://fairwear.org/</p>	

Figure 5: The most common eco-labels for the textile and clothing industry; Source: “Social and Eco-labelling of Textile and Clothing Goods as Means of Communication and Product Differentiation”

3.5 Eco-labels in the clothing industry: success factors and pitfalls

Eco-labels are effective communication tools to prove the level of environmental and social friendliness of a garment and they constitute a support to consumers on their green purchasing decision (Ranasinghe, 2021). They constitute a valid way to identify sustainable and eco-

fashion brands, which promptly reacted to green consumers' pressure for change (Henninger, 2015).

For instance, five institutions manage standards for clothing certification in the UK: "the Ethical Trading Initiative, the Fair-Trade Foundation, the Global Network of Fairtrade Organisations, the Fairtrade Labelling Organisation, and the Soil Association and Global Textile Standards Institution" (Henninger, 2015).

Moreover, data show that consumers prefer information which is displayed on the product or labelled (Koszewska, 2011). They developed greater sensitivity for social issues, like child labour, but they are also concerned about fabric composition, 'not tested on animals', "fair pay for workers" and "environmentally friendly" products (Koszewska, 2011).

As a consequence of a wide picture of environmental and social criteria representing such issues, the Ecolabel Index, known to be the world's largest global directory of ecolabels, indicates 107 ecolabels available to the Textile sector (Ranasinghe, 2021).

Each textile manufacturing firm, looking for a certification, must select the most suitable alternative, or a proper combination of them, in order to "cover a range of aspects that signifies their commitment to sustainability" (Ranasinghe, 2021). In particular, European labels are found to use "toxics, chemicals, natural resources, pesticides/herbicides/fungicides, and material use as prevailing criteria" (Ranasinghe, 2021).

Indeed, this variety of eco-labels and certifications may become source of confusion for consumers, who probably have heard about some of them, but lack the understanding of the specific meaning (Henninger, 2015). As a result of this "ignorance" in the fashion market, companies need to develop effective communication strategies. These must be aimed to inform and educate consumers about sustainability, through the promotion and successful use of eco-labels (Henninger, 2015).

As stated by Henninger (2015): "currently eco-labels in the fashion industry are not well recognised by consumers, thus there may be a need to develop stronger marketing communication strategies that fill this gap".

For the purpose of being beneficial to green purchases, eco-labels must be "easily understandable and straightforward", even with attention to their design (Henninger, 2015).

Overall, it can be assumed that the general feeling towards eco-labels in the Fashion industry splits in two. Some people have great confidence, others believe eco-labels are costly and not credible (Henninger, 2015).

To summarize, a picture of pros and cons of eco-labels is provided below.

The main *advantages* of labels, which make them more effective in communication, are simplicity and visibility of the conveyed message (Koszewska, 2011). “In the case of consumer goods, such as textiles and clothing, labels are a particularly useful and efficient instrument providing consumers with information on the properties of products meeting, or not, their social and ecological expectations or preferences.” (Koszewska, 2011). Labels are useful for busy consumers who have no time to look for information about products and services (Koszewska, 2011). Moreover, labels can improve the image and reputation of the company and raise consumers’ awareness about sustainability and environmental issues (Koszewska, 2011). Eco-labelling is increasingly becoming a *differentiating mean* for better products, from a social and ecological perspective, with respect to traditional ones (Koszewska, 2011).

“Eco and social labels are awarded by public or private organisations” in order to promote sustainable products, with “comparable usability and functional characteristics” (Koszewska, 2011).

At the same time, labels have many *disadvantages* and weak points, which may contrast effectiveness in communication. In fact, they can create confusion and frustration in the market, with a need for more transparent and clearer information (Koszewska, 2011). In this regard, Koszewska (2011) states that the “lack of transparency followed by the eroding credibility of labels has become one of the major problems affecting labelling systems”. Several studies showed frequent consumer’s skepticism and uncertainty about their conveyed message (Koszewska, 2011). In fact, the diffusion of false labels may be a driver of such consumer’s skepticism and lack of credibility.

Moreover, costs associated to certification and licensing are one reason for the scarce progress in the eco-labels direction made by the business community up to now (Koszewska, 2011).

To sum up, Koszewska (2011) points two success factors for labelling systems: “one is the *awareness* of consumers and their ability to understand their message, and the other one is the business community’s *willingness to accept* the systems.”

In order to address such challenges, clothing companies must embrace new transparent standardisation and certification systems, which have to fit with the existing ones and include all relevant aspects of the production and supply chain; they must develop a “methodological framework ensuring some systemisation of the present diversity of signs and labels.” (Koszewska, 2011).

Most of all, firms must invest time and capital in consumer education and information, as “the market impact of labelled goods depends on the level of environmental awareness and the consumer demand for green goods.” (Galarraga Gallastegui, 2002).

Consumers may have an active role and change their purchasing behaviour to satisfy their environmental concern (Galarraga Gallastegui, 2002). This aspect underlines the mediating action of consumer environmental knowledge and information failures (Galarraga Gallastegui, 2002).

3.6 A literature review on effectiveness of eco-labels as green marketing tools

Green marketing includes all initiatives, as “green production, green pricing, eco-labeling, and recycling”, undertaken by firms in order to promote their green products, services, and practices, and raise consumer awareness (Sharma, 2019). Eco-labels constitute an important help to consumers during their purchasing decision, as a guide towards the most sustainable and less impacting alternatives (Sharma, 2019). They drive communication, consumer’s trust and knowledge (Sharma, 2019).

However, several times eco-labels are not able to provide the expected benefits, due to some “dark clouds” fluttering on them: “consumer skepticism, lack of awareness among consumers, fake eco-labels, lack of trusted eco-labeling agencies, and lack of monitoring agencies” (Sharma, 2019). In order to solve doubts and uncertainties among consumers, governments and organizations have introduced standard schemes and guidelines for labelling (Sharma, 2019). It is important to mention the role of consumer’s knowledge about eco-labels and general environmental issues, influencing their effectiveness.

Such knowledge works as driver of trust, which in turn helps consumer’s purchasing intention towards green products (Sharma, 2019). Sharma (2019) states that consumers who receive education are able to develop a deeper environmental awareness and they would trust eco-labels more likely.

Moreover, it has been found that most of European consumers base their purchasing choice on eco-labels and certifications (Sharma, 2019). Therefore, it is clear how they are able to influence and shape consumers’ purchasing actions, and carry out a strategic role (Sharma, 2019).

Indeed, eco-labels’ effectiveness “largely depends on its awareness among the consumers” (Sharma, 2019). In order to grant it, companies must defeat the general ignorance about

environmental and social issues, by investing and promoting education programs dealing with sustainability and eco-labels' role (Sharma, 2019).

Several studies, other than the one conducted by Sharma (2019), provided insights into the *effectiveness* and the *impacts* of eco-labels on consumer behavior.

Roy Choudhury (2015) agrees on considering eco-labels as differentiating marketing tools, which help informed and environmentally conscious consumers to choose sustainable products, in turn reducing their consumption impacts. Moreover, the author gives a positive future perspective on eco-labels: they are expected to grow, in order to promote sustainability and drive a development of a credible Textile industry (Roy Choudhury, 2015).

Gam, Ma and Banning (2014) suggest the positive impact of socially responsible labels on apparel purchasing as promotional tools. In order to attract consumers, such labels must incorporate emotional shopping messages and contain detailed information on socially responsible efforts (Gam et al., 2014). However, their findings show cost-conscious fashion consumers who are not willing to pay a price premium for sustainability. In addition, Gam, Ma and Banning (2014) found that past experience and familiarity with “green” products bring more likely an actual purchase.

In contrast, Hustvedt and Bernard (2010) suggest that consumers may be inclined to pay more for labelled apparel which display information about labour-related issues. In addition, the price level seems influenced by ethnicity and presence of brand's name, with the latter having an incentive effect (Hustvedt, 2010). They also agree on consumer “positive attitudes towards social responsibility and fair trade” enhancing even more the WTP (Hustvedt, 2010).

Hyllegard, Yan, Ogle and Lee (2012) also suggest the beneficial effects on consumer attitudes and positive evaluations of socially responsible labels, especially in presence of a female consumers' target. When communicating a firm's sustainability practices, their research shows the major importance of conveying an explicit message through labelling, including third-party logos and certifications of their practices. Hyllegard, Yan, Ogle and Lee (2012) agree on consumer clothing involvement and past purchasing of sustainable apparel shaping the favorable consumer attitudes towards fashion brands which engaged in such efforts.

Roy Choudhury (2015) also points out the particular effectiveness of certified eco-labels, perceived as more credible by consumers. Gosselt, van Rompay and Haske (2017) support such findings by exploring how an external CSR label may affect consumer responses more positively than an internal claim, in terms of brand attitude, corporate credibility, purchase

intention. Indeed, they underlined the importance of an external rating system or third-party certification to reduce the risk of greenwashing and customer skepticism.

4. Methodology

4.1 Questionnaire

Data was collected through an online survey, developed using Google Forms as a support tool. The aim of this analysis is to study the influence of certified eco-labels on consumer purchasing behavior (Rutten, 2022). The questionnaire was tailored to measure some key factors concerning the following variables: attitude towards the company, purchase intention, willingness to pay a premium, consumer awareness of the environmental and social impact of the Fashion industry and level of consumer knowledge about certified eco-labels (Rutten, 2022). Each question asks for an evaluation from 1 to 5, in a growing intensity scale. The questionnaire was adapted and customized for this thesis from the original version contained in “*The influence of certified eco-labels on clothing on consumer behaviour*”, a master thesis written by Leslie Rutten in 2022.

The survey was shared via social networks and online channels as Facebook, Instagram, WhatsApp. It was available in Italian, as most of all potential respondents were Italian speakers.

Concerning the mean of sharing, some points must be discussed because online surveys have both benefits and pitfalls.

On the one hand, advantages of online surveys may include speed, reach, ease, cost, flexibility, and automation (Ball, 2019). In fact, “an online survey can be rapidly deployed and completed by participants, particularly when disseminated via social media and/or email, or where an incentive is offered for completion. There are minimal costs involved as delivery of the survey questions and capture of the responses is automated, reducing the need for paid researchers to ask face-to-face questions or enter data, reducing data entry errors and making the coding and cleaning of data almost obsolete” (Ball, 2019). These reasons brought the author of this thesis to go in such direction of data collection, properly fitting the final purposes of the analysis.

On the other, possible downsides can be related to biased and non-representative responses, as well as many people who have no internet access, not having the chance to answer (Ball, 2019). Another bias-related problem affects the sample: “respondents may share the survey with their friends and colleagues with similar interests or perspectives, which may lead to the over-representation of a particular viewpoint” (Ball, 2019). Moreover, participants may provide duplicate responses, fraudulent information, or they may deliberately submit wrong responses, all called “deceptive practices” (Ball, 2019).


In order to show the content of the questionnaire in detail, here the reader can find some representative images. It is structured in five sections, representative of the five variables under analysis, and a final part of demographics.

Figure 6: *Questionnaire*

Attitudine del consumatore nei confronti dell'azienda

Esprimi il tuo giudizio su una scala di intensità da 1 a 5

- Quando vedo un capo di abbigliamento o un accessorio avente un'etichetta ecologica certificata (come quella rappresentata nell'immagine), trovo l'azienda:




Mark only one oval.

1
2
3
4
5

Non attraente
☐
☐
☐
☐
☐
Attriante

- Quando vedo un capo di abbigliamento o un accessorio con un'etichetta ecologica certificata (come quella in figura), il mio sentimento nei confronti dell'azienda è:



Mark only one oval.


1
2
3
4
5

Non favorevole
☐
☐
☐
☐
☐
Favorevole

Intenzione di acquisto del prodotto sostenibile

Esprimi il tuo giudizio su una scala di intensità da 1 a 5

- La probabilità che io compri un capo di abbigliamento o accessorio con un'etichetta ecologica certificata è:




Mark only one oval.

1
2
3
4
5

Molto bassa
☐
☐
☐
☐
☐
Molto alta

- La probabilità che io prenda in considerazione l'acquisto di un capo di abbigliamento o accessorio con una simile etichetta ecologica certificata è:



Mark only one oval.


1
2
3
4
5

Molto bassa
☐
☐
☐
☐
☐
Molto alta

Disponibilità a pagare per la sostenibilità

Esprimi il tuo giudizio su una scala di intensità da 1 a 5

- La mia volontà di acquistare un capo di abbigliamento o accessorio con un'etichetta ecologica certificata del genere è:




Mark only one oval.

1
2
3
4
5

Molto bassa
☐
☐
☐
☐
☐
Molto alta

- Sono disposto ad acquistare capi con etichette ecologiche certificate anche se costano di più.



Mark only one oval.

1
2
3
4
5

Fortemente in disaccordo
☐
☐
☐
☐
☐
Fortemente in accordo

7. Comprerei comunque vestiti ed accessori con etichette ecologiche certificate anche se altri marchi/aziende di capi senza etichette ecologiche riducessero i loro prezzi.

Mark only one oval.

	1	2	3	4	5	
Fortemente in disaccordo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fortemente in accordo

Consapevolezza dell'impatto ambientale e sociale dell'industria della moda

Esprimi il tuo giudizio su una scala di intensità da 1 a 5

8. Sono consapevole dell'impatto ambientale e sociale dell'industria della moda.

Mark only one oval.

	1	2	3	4	5	
Fortemente in disaccordo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fortemente in accordo

9. Credo che sia importante acquistare abbigliamento sostenibile per aiutare a preservare l'ambiente.

Mark only one oval.

	1	2	3	4	5	
Fortemente in disaccordo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fortemente in accordo

13. Quanto conosci le seguenti etichette ecologiche?



Mark only one oval.

	1	2	3	4	5	
Per nulla	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Molto

14. Conosco il significato e la funzione di alcune delle etichette ecologiche certificate precedentemente indicate.

Mark only one oval.

	1	2	3	4	5	
Per nulla a conoscenza	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Perfetta conoscenza

Variabili socio-economiche

Scegli una risposta tra le proposte indicate

10. Le risorse che vengono utilizzate durante le fasi produttive dei capi (acqua, materie prime, ecc.) sono scarse e limitate, dunque dovrebbero essere consumate con attenzione e consapevolezza.

Mark only one oval.

	1	2	3	4	5	
Fortemente in disaccordo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fortemente in accordo

11. L'impatto sociale dell'industria della moda, in particolare lo sfruttamento minorile in alcuni paesi in via di sviluppo, è una questione importante.

Mark only one oval.

	1	2	3	4	5	
Fortemente in disaccordo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fortemente in accordo

Conoscenza delle etichette ecologiche certificate

Esprimi il tuo giudizio su una scala di intensità da 1 a 5

12. Quanto ti consideri familiare con le etichette ecologiche certificate?

Mark only one oval.

	1	2	3	4	5	
Per nulla familiare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Molto familiare

15. Quale è il tuo genere?

Mark only one oval.

- ☐ Femmina
☐ Maschio
☐ Altro

16. Quanti anni hai?

Mark only one oval.

- ☐ Meno di 18
☐ Tra 18 e 24
☐ Tra 25 e 34
☐ Tra 35 e 44
☐ Tra 45 e 64
☐ Più di 65

17. Attualmente vivi in Italia?

Mark only one oval.

- ☐ Sì
☐ No

18. Quale è il tuo livello di educazione?

Mark only one oval.

- ☐ Scuola media
☐ Formazione professionale intermedia
☐ Scuola superiore
☐ Laurea triennale
☐ Laurea magistrale
☐ Dottorato di ricerca

Figure 7: Questionnaire

19. Quale è la tua attuale professione?

Mark only one oval.

- ☐ Occupato
☐ Studente
☐ Pensionato
☐ Casalingo/a
☐ Disoccupato
☐ Nessuna delle precedenti

4.2 Analysis

In order to structure this statistical analysis properly, the author has followed some guidelines included in the previously mentioned paper written by Leslie Rutten in 2022.

At first, the variables “età”, “istruzione” and “professione” are analyzed. Some considerations about *demographics* are done, looking at the frequencies and percentages of occurrence.

Each section of the survey corresponds to a group of similar variables, each of which is associated to a single question. In order to reduce data dimensionality, these similar variables have been aggregated, by creating a new variable for every group; the latter is defined as an overall mean of the similar variables contained in each group. Accordingly, five aggregating variables, being “attitudine_all”, “intenzione_all”, “disponibilità_all”, “consapevolezza_all” and “conoscenza_all”, are generated.

For instance, “attitudine_all” has been constructed as follow:

```
gen attitudine_all = (attitudine_consumatore1 + attitudine_consumatore2) /2
```

“Attitudine_consumatore1” and “attitudine_consumatore2” refer to the first two questions contained in the first section of the survey which corresponds to the group of consumer attitude. The remaining variables have been computed by following the same reasoning. The table below summarizes them.

Group/Section	Aggregating variable	Formula
attitudine_consumatore*	attitudine_all	$(attitudine_consumatore1 + attitudine_consumatore2)/2$
intenzione_acquisto*	intenzione_all	$(intenzione_acquisto1 + intenzione_acquisto2 + intenzione_acquisto3)/3$
disponibilità_apagare*	disponibilità_all	$(disponibilità_apagare1 + disponibilità_apagare2)/2$
consapevolezza_impatto*	consapevolezza_all	$(consapevolezza_impatto1 + consapevolezza_impatto2 + consapevolezza_impatto3 + consapevolezza_impatto4)/4$
conoscenza_label*	conoscenza_all	$(conoscenza_label1 + conoscenza_label2 + conoscenza_label3)/3$

Table 1: *Aggregating variables*

For each of these aggregating variables, independence with respect to demographic variables is determined through a *chi squared test*, in order to uncover possible patterns of mutual relation. In fact, this test is able to say if two categorical or nominal variables may be related. Moreover, a set of tests have been carried out to see if the subsamples (i.e., man and women, age groups, education levels and professions) present any significant difference, with respect to a given variable's mean. They are described below.

Levene's test on variances' equality have been performed, in order to determine which type of *t-test* should have followed. In fact, the latter, looking at means' equality among two subsamples with the same variances, can be extended to the case of diverse variances using the option "unequal". T-test is suitable only for gender, as here the subsamples are only two.

Kruskal-Wallis' test has been performed as well: it is a non-parametric test on equality of medians, verifying if the k subsamples come from the same population and have the same distribution (Xia, 2020). It appears to be suitable for this dataset as there is no assumption about a normal distribution of data.

However, in most cases, *one-way ANOVA test* has been used to extend the two-sample t-test as it is not suitable in case of $k > 2$ subsamples. In particular, ANOVA test was used to find differences of means among age groups, education levels and types of profession, as they are more than two.

In the end, *multiple regression* was done to predict the effect of "consapevolezza_all" and "conoscenza_all" (independent variables) on the other dependent variables ("attitudine_all", "intenzione_all", "disponibilità_all"). In addition, the influence of demographics and their interaction with "consapevolezza_all" and "conoscenza_all" on the dependent variables are considered.

5. Results

A total of 267 responses were collected through online channels. However, one of them was canceled as it contained missing values, bringing the effective total of responses to 266. The questionnaire was available in Italian, so it has been assumed that respondents were Italian speakers, mostly living in Italy.

All results have been processed and achieved using Stata software.

5.1 Demographics

Females are 63.53% of participants, while men constitute only 35.34% of the total, considering 3 people who answered “Other”. For what concerns age classes, *Table 2* below summarizes the frequency of occurrence and the absolute and cumulated percentage for each class.

. tab age

Quanti anni hai?	Freq.	Percent	Cum.
Meno di 18	4	1.50	1.50
Tra 18 e 24	113	42.48	43.98
Tra 25 e 34	107	40.23	84.21
Tra 35 e 44	9	3.38	87.59
Tra 45 e 64	33	12.41	100.00
Total	266	100.00	

Table 2: *Demographics' results*

Data show that the largest age class is 18-24 years old with 113 occurrences (42.48%), followed immediately by 25-34 years old being 40.23% of the total (107 occurrences). People aged between 45 and 64 years are 33 (12.41% of the total), while those aged from 35 to 44 years are 3.38% (9 observations). Moreover, 4 kids under 18 years old answered: being an irrelevant 1.5%, they will be excluded from the statistical analysis.

When looking at the variables “educazione” and “professione”, pie charts in *Figure 9* and *Figure 10* may display the raw distribution properly. From them, it is clear how some classes among the levels of education and type of professions are not significative, in terms of number of respondents. This is the reason why, for the future purposes of the analysis, these groups will be incorporated to other larger groups, as shown in the second pie chart to the right in *Figure 9* and *Figure 10*.

“Dottorato di ricerca” (1.13%) is merged with “Laurea magistrale”, while “Formazione professionale intermedia” is joined to “Scuola media” (2.26% and 1.5% respectively), for the variable “educazione”.

Instead, for the variable “professione”, “Casalingo/a”, “Disoccupato”, “Nessuna delle precedenti” and “Pensionato” can be incorporated, as they represent 0.75%, 1.13%, 1.88%, 1.5% respectively.

These new aggregated classes will be used in the following tests on independence, means and medians' equality.

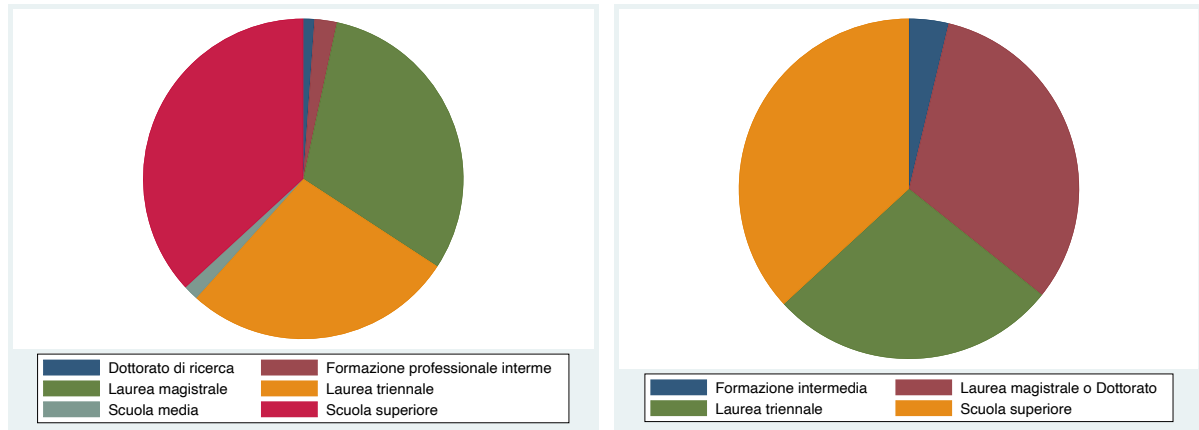


Figure 8: *Education pie chart-original vs aggregated.*

For what concerns *education*, the original pie chart shows that 36.84% of respondents attended high school (98 observations), 30.83% got a master's degree (82 observations) and 27.44% a bachelor's (73 observations). People who attended professional schools are 6 (2.26%), while those who attended only three years of middle school are 1.5% (4 observations). Post-graduated doctoral researchers are 1.13% of the total (3 people).

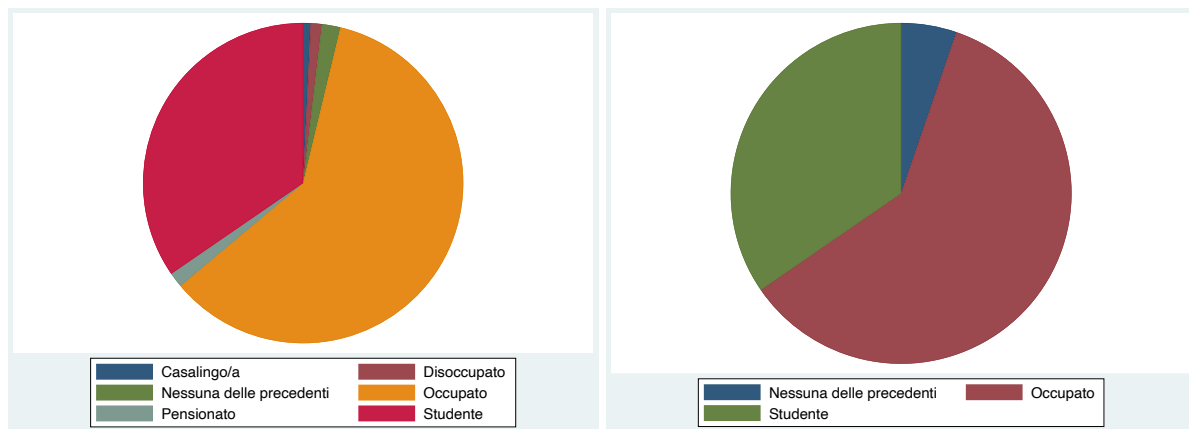


Figure 9: *Professions pie chart-original vs aggregated*

Moreover, for what concerns the *type of occupation*, the original pie chart indicates that more than half respondents are currently employed (60.15% or 160 observations), while 34.59% of them are students (92 people). Unemployed people are 3 (1.13%) and retired ones are 4 (1.5%).

5.2 Attitude towards the company

The mean of "*attitudine_all*" is 4.07 and its median (50% percentile) is 4, which show a general, positive attitude of consumers towards companies making use of certified eco-labels.

It means that respondents generally develop positive firm's perception when clothing companies use eco-labels to communicate their sustainability efforts.

For the purpose of this analysis, values below 2.5 have been aggregated to the group of effective 2.5 values, to gain more significance in results.

When considering consumer's attitude with respect to *gender*, some differences arise between men and women. In fact, women (mean = 4.14) seem to have a more positive attitude towards the use of certified eco-labels than men (mean 3.94). After having performed a chi squared test, it is possible to state that the null hypothesis of independence between "genere" and "attitudine_all" must be rejected, as the p-value is **0.027** < 0.05 (taken as alpha significance level). Levene's test on equality of variances reveals that the null hypothesis can be accepted as the p-value is 0.6 > 0.05. Moreover, the two-sample t-test confirms, with a p-value of **0.04** < 0.05, that the means of the two subgroups are not equal. Instead, the Kruskal-Wallis' equality-of-populations rank test, working on medians' equality, gives a p-value of **0.02**: being lower than 0.05, the null hypothesis of medians' equality must be rejected as well.

When considering the stratification for *age groups*, there seem to be no significant divergences. The chi squared test of independence between "età" and "attitudine_all" gave a p-value of 0.17 and the null hypothesis cannot be rejected with 0.05 alpha. Levene's test gives a p-value of 0.06, showing that variances can be considered equal. However, given that age groups are more than two, t-test cannot be performed, but it is substituted by the one-way ANOVA, which contains an Analysis of Variances. Results show that the p-value (Prob > F) of ANOVA test between the age groups is 0.37: it is higher than 0.05 and in turn, the null hypothesis of means equality cannot be rejected. Instead, the Kruskal-Wallis' equality-of-populations rank test can be done and its p-value is 0.4: the null hypothesis of medians' equality must be accepted. All age groups seem to be equal with respect to "attitudine_all". Note that for this analysis the group of people aged less than 18 has been excluded.

Consumer attitude shows significant divergences with respect to *education level* groups. The chi squared test of independence between "istruzione" and "attitudine_all" gave a p-value of **0.003** and the null hypothesis must be rejected with alpha = 0.05: these two variables are dependent. Levene's test gives a p-value of 0.09, showing that variances can be considered equal. Also, education levels' groups are more than two and t-test cannot be performed, but it is replaced by one-way ANOVA test. Results show that the p-value (Prob > F) between the

groups is **0.0002**, showing that means of the subsamples cannot be considered equal. Instead, the Kruskal-Wallis' equality-of-populations rank test can be done and its p-value is **0.0005**: the null hypothesis of medians' equality must be rejected.

One-way ANOVA test proved that means are not equal, but it is important to understand which groups have a statistically significant difference through post hoc tests. *The pairwise comparisons of means with equal variances*, using the Tukey method to correct p-values, is used to this purpose. Six comparisons among education level groups are done. Two contrasts, “*Scuola superiore vs Laurea magistrale o Dottorato*” and “*Scuola superiore vs Laurea triennale*”, were the most significant, with p-values of **0.006** and **about zero**, respectively. This means that the group of people who attended high school shows the greatest (negative) difference with respect to those who got a degree, both bachelor's and master's, with the latter showing a better attitude towards fashion companies which use certified eco-labels. Even the contrast “*Scuola superiore vs Formazione intermedia*” is high (-0.54), but the test is not confident in rejecting the null hypothesis, due to a high variance and few observations.

attitudine_all	Contrast	Std. Err.	Tukey t P> t		Tukey [95% Conf. Interval]	
n_istruzione2						
Laurea magistrale o Dottorato vs Formazione intermedia	-.1794118	.2461884	-0.73	0.886	-.8159553	.4571318
Laurea triennale vs Formazione intermedia	-.0760274	.2483093	-0.31	0.990	-.7180546	.5659998
Scuola superiore vs Formazione intermedia	-.5387755	.2444636	-2.20	0.125	-1.170859	.0933083
Laurea triennale vs Laurea magistrale o Dottorato	.1033844	.1175095	0.88	0.815	-.2004476	.4072163
Scuola superiore vs Laurea magistrale o Dottorato	-.3593637	.1091487	-3.29	0.006	-.6415779	-.0771496
Scuola superiore vs Laurea triennale	-.4627481	.1138515	-4.06	0.000	-.7571221	-.1683742

Table 3: *Contrasts for education level*

In the end, when considering consumer's attitude with respect to his *profession*, these two variables seem independent, as shown by the related chi squared test between “professione” and “attitudine_all”, with a p-value of 0.48. The null hypothesis must be accepted with alpha = 0.05. It is crucial to underline that students, employed people and “everything else” are considered as subsamples. Levene's test gives a p-value of 0.59, showing that variances can be considered equal. Given that professions' groups are three, t-test cannot be performed. Thus, it is substituted by the one-way ANOVA test, whose results show that the p-value (Prob > F) between the profession categories is 0.83: means of the subsamples must be considered equal. Instead, the Kruskal-Wallis' equality-of-populations rank test can be done and its p-value is 0.73: the null hypothesis of medians' equality must be accepted. Here, subgroups do not present differences with respect to “attitudine_all”.

5.3 Purchase intention

The mean of “*intenzione_all*” is 3.52 and its median (50% percentile) is 3.67, which suggests an overall positive purchase intention of consumers towards clothing and accessories with certified eco-labels. This indicates that most respondents were willing to buy fashion items with a certified eco-label.

Again, for the purpose of this analysis, values below 2.5 have been aggregated to the group of effective 2.5 values, to gain more significance in results.

By considering *gender*, no significant differences arise between men and women. After having performed a chi squared test, it is possible to state that the null hypothesis of independence between “*genere*” and “*intenzione_all*” must be accepted, as the p-value is $0.17 > 0.05$ (taken as alpha). Levene’s test on equality of variances reveals that the null hypothesis can be accepted, as the p-value is $0.59 > 0.05$.

Moreover, the two-sample t-test shows, with a p-value of $0.83 > 0.05$, that the means of the two subgroups are equal. Instead, the Kruskal-Wallis’ equality-of-populations rank test, working on medians’ equality, gives a p-value of 0.71: being higher than 0.05, the null hypothesis of medians’ equality must be accepted as well.

Furthermore, *age groups* also show no significant divergences in their purchasing intention. In fact, the chi squared test between “*età*” and “*intenzione_all*” gave a p-value of 0.45 and the null hypothesis cannot be rejected with $\alpha = 0.05$, confirming their independence. Levene’s test on equality of variances reveals that the null hypothesis cannot be accepted, as the p-value is **0.004**. Results from one-way ANOVA test show that the p-value (Prob > F) between the age groups is 0.225: subsamples’ means are equal. Instead, the Kruskal-Wallis’ equality-of-populations rank test can be done and its p-value is 0.25: the null hypothesis of medians’ equality must be accepted.

When analyzing purchase intention with respect to the *education level*, significant divergences among the groups’ means come out. The chi squared test of independence between “*istruzione*” and “*intenzione_all*” gave a p-value of 0.14 and the null hypothesis must be accepted: these two variables are independent. Levene’s test on equality of variances reveals that the null hypothesis can be accepted, as the p-value is 0.13. One-way ANOVA test gave a p-value (Prob > F) between the groups of **0.032** < 0.05. These results show that means of the subsamples cannot be considered equal, while their variances are. Instead, the Kruskal-Wallis’ equality-of-

populations rank test can be done and its p-value is $0.072 > 0.05$: the null hypothesis of medians' equality must be accepted.

In order to understand which education level's groups are statistically different, *the pairwise comparisons of means with equal variances*, using the Tukey method to correct p-values, is done and six comparisons among education level groups are performed. The only contrast which may be considered significant, even with a p-value of **0.067**, is “*Scuola superiore vs Laurea triennale*”. This means that the group of people who attended high school shows a slight difference with respect to those who got a bachelor's degree, with the latter being keener to purchase labelled clothing.

intenzione_all	Contrast	Std. Err.	Tukey t	P> t	Tukey [95% Conf. Interval]
n_istruzione2					
Laurea magistrale o Dottorato vs Formazione intermedia	-.1470588	.2844522	-0.52	0.955	-.8825369 .5884193
Laurea triennale vs Formazione intermedia	-.1182648	.2869026	-0.41	0.976	-.8600788 .6235492
Scuola superiore vs Formazione intermedia	-.4435374	.2824592	-1.57	0.397	-1.173863 .2867877
Laurea triennale vs Laurea magistrale o Dottorato	.028794	.1357734	0.21	0.997	-.3222609 .3798489
Scuola superiore vs Laurea magistrale o Dottorato	-.2964786	.126113	-2.35	0.089	-.6225558 .0295986
Scuola superiore vs Laurea triennale	-.3252726	.1315469	-2.47	0.067	-.6653995 .0148543

Table 4: *Contrasts for education level*

Lastly, purchase intentions of different *profession groups* have been compared. A chi squared test between “professione” and “intenzione_all” gave a p-value of 0.82 and the null hypothesis must be accepted with $\alpha = 0.05$: these two variables present no pattern of dependence. Levene's test on equality of variances reveals that the null hypothesis can be accepted, as the p-value is 0.92. One-way ANOVA test shows that the p-value (Prob > F) is 0.42: this result shows that means of the subsamples must be considered equal. Instead, the Kruskal-Wallis' equality-of-populations rank test can be done and its p-value is 0.43: the null hypothesis of medians' equality must be accepted. In turn, no relevant differences among professions' groups came out of the analysis.

5.4 Willingness to pay a premium for sustainability

The mean of “*disponibilità_all*” is 3.25 and its median (50% percentile) is 3.5, which show that, in most cases, consumers were willing to pay a premium for clothing and accessories with certified eco-labels.

Again, for the purpose of this analysis, values below 2.5 have been aggregated to the group of effective 2.5 values.

No significant differences arise between men and women. After having performed a chi squared test, it is possible to state that the null hypothesis of independence between “genere” and “disponibilità_all” must be accepted, as the p-value is $0.23 > 0.05$ (taken as alpha value). Levene’s test on equality of variances reveals that the null hypothesis cannot be accepted as the p-value is **0.04**: in turn, a t-test with *unequal variances* must be chosen.

Such two-sample t-test shows, with a p-value of $0.94 > 0.05$, that the means of the two subgroups are equal. Instead, the Kruskal-Wallis’ equality-of-populations rank test, working on medians’ equality, gives a p-value of 0.95: being higher than 0.05, the null hypothesis of medians’ equality must be accepted as well.

When stratifying the willingness to pay a premium with respect to *age groups*, there seem to be no significant divergences. The chi squared test of independence between “età” and “disponibilità_all” gave a p-value of **0.056**, and the null hypothesis must be rejected with alpha set to 0.05, even with this surplus of 0.006: the two variables show a pattern of mutual dependence. Levene’s test on equality of variances reveals that the null hypothesis cannot be accepted as the p-value is **0.004**. One-way ANOVA test returned a p-value (Prob > F) between the age groups of 0.63: the result shows that subsamples’ means are equal. Instead, the Kruskal-Wallis’ equality-of-populations rank test can be done and its p-value is 0.64: the null hypothesis of medians’ equality must be accepted. Overall, the subsamples can be treated as equal with respect to the willingness to pay a premium.

Instead, it was found that there are significant divergences among the *education level* groups, in terms of means and medians of consumer’s willingness to pay a premium. The chi squared test of independence between “istruzione” and “disponibilità_all” gave a p-value of **0.004** and the null hypothesis must be rejected with alpha value at 0.05: these two variables are somehow dependent. Levene’s test on equality of variances reveals that the null hypothesis can be accepted as the p-value is 0.23. One-way ANOVA p-value (Prob > F) between the groups is **0.004** < 0.05 and shows that means of the subsamples cannot be considered equal, while their variances are. Instead, the Kruskal-Wallis’ equality-of-populations rank test can be done and its p-value is **0.008** < 0.05: the null hypothesis of medians’ equality must be rejected.

In order to identify which specific groups are significantly different from each other, a *pairwise comparisons of means with equal variances*, using the Tukey method, performed six comparisons among education level groups. The contrast “*Scuola superiore vs Formazione intermedia*” was the most significant (-0.96), with a p-value of **0.009**. Surprisingly with respect

to previous results, this means that the group of people who attended high school shows the greatest difference with respect to those who attended professional schools, with the latter being more willing to pay for sustainability.

disponibilità_all	Contrast	Std. Err.	Tukey		Tukey	
			t	P> t	[95% Conf. Interval]	
n_istruzione2						
Laurea magistrale o Dottorato vs Formazione intermedia	-.6964286	.3041672	-2.29	0.103	-1.48294	.0900831
Laurea triennale vs Formazione intermedia	-.6319444	.3068518	-2.06	0.169	-1.425398	.1615092
Scuola superiore vs Formazione intermedia	-.9639175	.301991	-3.19	0.009	-1.744802	-.1830328
Laurea triennale vs Laurea magistrale o Dottorato	.0644841	.1460308	0.44	0.971	-.3131205	.4420887
Scuola superiore vs Laurea magistrale o Dottorato	-.267489	.1355195	-1.97	0.201	-.6179136	.0829357
Scuola superiore vs Laurea triennale	-.3319731	.1414423	-2.35	0.090	-.6977128	.0337666

Table 5: *Contrasts for education level*

In conclusion, when considering consumer's willingness to pay a premium with respect to the type of *profession*, the chi squared test between “professione” and “disponibilità_all” gave a p-value of 0.22 and the null hypothesis must be accepted: these two variables present no pattern of dependence. Levene's test on equality of variances reveals that the null hypothesis can be accepted as the p-value is 0.35. Results from one-way ANOVA test show that the p-value (Prob > F) between the profession categories is 0.26. These results shows that means and variances of the subsamples must be considered equal. Instead, the Kruskal-Wallis' equality-of-populations rank test can be done and its p-value is 0.45: the null hypothesis of medians' equality must be accepted. In turn, no relevant differences among professions' groups came out of the analysis.

5.5 Awareness of environmental and social impacts of Fashion Industry

The variable “*consapevolezza_all*” has a mean of 4.47 and a median (50% percentile) of 4.5. This shows how respondents were strongly aware about the harmful effects of Fashion Industry's industrial practices.

Values of “*consapevolezza_all*” lower than 2.5 have been aggregated with the observations having an effective value of 2.5.

Looking at the *gender*, a chi squared test on independence of “genere” and “*consapevolezza_all*” provided a p-value of **0.005** < 0.05: these two variables present a pattern of mutual dependence, and the null hypothesis must be rejected. Levene's test on equality of variances reveals that the null hypothesis cannot be accepted as the p-value is **0.01** < 0.05. As a result, a two-sample t-test with *unequal variances* must be done. It shows, with a p-value of **0.01** < 0.05, that the means of the two subgroups are not equal. Instead, the Kruskal-Wallis' equality-of-

populations rank test, working on medians' equality, gives a p-value of **0.015**: being lower than 0.05, the null hypothesis of medians' equality must be rejected as well. Overall, the two groups of men and women present significant differences, with the second (mean = 4.54) being more aware than the first (mean = 4.34).

For what concerns the *level of education*, the chi squared test revealed a pattern of independence between “istruzione” and “consapevolezza_all”, having a p-value of 0.18. Levene's test on equality of variances reveals that the null hypothesis can be accepted as the p-value is 0.45. Instead, one-way ANOVA p-value (Prob > F) between the groups is **0.057**. These results show that means are not equal, even with the surplus of 0.007 with respect to $\alpha = 0.05$, while variances of the subsamples can be considered equal. The Kruskal-Wallis' equality-of-populations rank test can be done and its p-value is **0.0065** < 0.05: the null hypothesis of medians' equality must be rejected.

To uncover which education level groups have a statistically significant difference, *pairwise comparisons of means with equal variances*, using the Tukey method, performed six contrasts, but only one of them may be relevant (-0.44), even with a p-value of **0.07**: “*Scuola superiore vs Formazione intermedia*”. It means, with a negative sign, that people who have an intermediate education seem slightly more aware than those who attended high school, surprisingly.

consapevolezza_all	Contrast	Std. Err.	Tukey		Tukey	
			t	P> t	[95% Conf. Interval]	
n_istruzione2						
Laurea magistrale o Dottorato vs Formazione intermedia	-.3044118	.1837882	-1.66	0.349	-.7796136	.1707901
Laurea triennale vs Formazione intermedia	-.3318493	.1853715	-1.79	0.280	-.8111449	.1474462
Scuola superiore vs Formazione intermedia	-.444898	.1825005	-2.44	0.073	-.9167704	.0269745
Laurea triennale vs Laurea magistrale o Dottorato	-.0274376	.0877249	-0.31	0.989	-.2542586	.1993835
Scuola superiore vs Laurea magistrale o Dottorato	-.1404862	.0814833	-1.72	0.313	-.3511689	.0701965
Scuola superiore vs Laurea triennale	-.1130486	.0849941	-1.33	0.545	-.332809	.1067117

Table 6: *Contrasts for education level*

Stratification with respect to *age groups* and the *type of profession* showed, for all the tests, non-significant results: subgroups are the same with respect to awareness of impacts.

5.6 Knowledge of certified eco-labels

The variable “*conoscenza_all*” has a mean of 2.3 and a median (50% percentile) of 1.33. This shows how respondents did not have much knowledge and experience about certified eco-labels.

Values of “conoscenza_all” higher than 4 have been aggregated with the effective 4-valued observations.

The chi squared test on independence of “*genere*” and “conoscenza_all” provides a p-value of **0.052**: these two variables present a pattern of mutual dependence, and the null hypothesis of independence cannot be accepted with $\alpha = 0.05$. Levene’s test on equality of variances reveals that the null hypothesis cannot be accepted as the p-value is **0.0025** < 0.05 . Therefore, a two-sample t-test with *unequal variances* must be carried out. However, it shows, with a p-value of $0.27 > 0.05$, that the means of the two subgroups are equal. Instead, the Kruskal-Wallis’ equality-of-populations rank test, working on medians’ equality, gives a p-value of 0.62: being greater than 0.05, the null hypothesis of medians’ equality must be accepted as well. Overall, the two groups of men and women do not present significant differences.

Looking at *age*, only the one-way ANOVA test revealed a p-value of $0.045 < 0.05$, which shows that the level of knowledge is different for different age groups. Levene’s test on variance equality gives a p-value of 0.02 and Kruskal-Wallis’ equality-of-populations rank test gives 0.11, showing different variances and same medians for the subgroups.

However, it is possible to compare roughly the means of age groups from the ANOVA output and see that the largest difference is between 18-24 (mean = 2.1) and 35-44 years old classes (mean = 2.7). Pairwise comparison of means assumes equal variances, but in this case Levene’s test does not accept such hypothesis.

Quanti anni hai?	Summary of conoscenza_all		
	Mean	Std. Dev.	Freq.
Tra 18 e 24	2.1160714	.88555285	112
Tra 25 e 34	2.4465409	1.0639716	106
Tra 35 e 44	2.6666667	1.4337209	9
Tra 45 e 64	2.4949495	1.155065	33
Total	2.3179487	1.0275999	260

Table 7: Means of age groups

For what concerns the *level of education*, the chi squared test revealed a pattern of independence between “istruzione” and “conoscenza_all”, having a p-value of 0.08.

Levene’s test on variance equality gives a p-value of 0.22, and p-value (Prob > F) of ANOVA test between the groups is $0.075 > 0.05$: these results show that means and variances of the subsamples can be considered equal. Instead, the Kruskal-Wallis’ equality-of-populations rank

test can be done and its p-value is $0.1 > 0.05$: the null hypothesis of medians' equality must be accepted. Overall, no significance differences over the degree of labels' knowledge arise among the education levels' groups.

Stratification with respect to the *type of profession* brought, for all the tests, non-significant results. Thus, subgroups are the same with respect to knowledge of eco-labels.

The next tables have the function to summarize the relevant statistics for each variable and results obtained from the various tests on demographic variables' influence.

The percentiles, associated to a certain the variable value, represent the percentage (%) of the distribution at their left. For example, by looking at *Table 8*, it can be said that 25% percentile is 3.5; in turn, 75% of observations are higher than 3.5, confirming the positive consumer attitude towards companies making use of eco-labels. In contrast, *Table 12* shows a 75% percentile equal to 3: this suggests that only 25% of data are higher than 3, confirming the scarce eco-labels knowledge among respondents.

attitudine_all				
	Percentiles	Smallest		
1%	2	1.5		
5%	3	1.5		
10%	3	2	Obs	266
25%	3.5	2	Sum of Wgt.	266
50%	4		Mean	4.073308
		Largest	Std. Dev.	.7606365
75%	4.5	5		
90%	5	5	Variance	.5785679
95%	5	5	Skewness	-.6159596
99%	5	5	Kurtosis	3.055357

Table 8: *Summary statistics-attitudine_all*

intenzione_all				
	Percentiles	Smallest		
1%	1	1		
5%	2	1		
10%	2.333333	1	Obs	266
25%	3	1.333333	Sum of Wgt.	266
50%	3.666667		Mean	3.52381
		Largest	Std. Dev.	.8602917
75%	4	5		
90%	4.666667	5	Variance	.7401018
95%	5	5	Skewness	-.2655775
99%	5	5	Kurtosis	2.911366

Table 9: *Summary statistics-intenzione_all*

disponibilità_all				
	Percentiles	Smallest		
1%	1	1		
5%	1.5	1		
10%	2	1	Obs	263
25%	2.5	1	Sum of Wgt.	263
50%	3.5		Mean	3.249049
		Largest	Std. Dev.	.9276031
75%	4	5		
90%	4.5	5	Variance	.8604476
95%	5	5	Skewness	-.1155756
99%	5	5	Kurtosis	2.644696

Table 10: *Summary statistics-disponibilità_all*

consapevolezza_all				
	Percentiles	Smallest		
1%	2.75	2		
5%	3.25	2.25		
10%	3.75	2.75	Obs	266
25%	4.25	3	Sum of Wgt.	266
50%	4.5		Mean	4.472744
		Largest	Std. Dev.	.554535
75%	5	5		
90%	5	5	Variance	.307509
95%	5	5	Skewness	-1.354583
99%	5	5	Kurtosis	5.04913

Table 11: *Summary statistics-consapevolezza_all*

conoscenza_all				
	Percentiles	Smallest		
1%	1	1		
5%	1	1		
10%	1	1	Obs	264
25%	1.333333	1	Sum of Wgt.	264
50%	2		Mean	2.305556
		Largest	Std. Dev.	1.025688
75%	3	5		
90%	3.666667	5	Variance	1.052035
95%	4	5	Skewness	.5280808
99%	5	5	Kurtosis	2.489166

Table 12: *Summary statistics-conoscenza_all*

TEST	attitudine_all	intenzione_all	disponibilità_all	consapevolezza_all	conoscenza_all
Chi-squared	0.027	0.17	0.23	0.005	0.05
Levene's	0.6	0.59	0.04	0.01	0.0025
T-test	0.04	0.83	0.94	0.01	0.27
Kruskal-Wallis'	0.02	0.71	0.95	0.015	0.62

Table 13: *Gender influence*

TEST	attitudine_all	intenzione_all	disponibilità_all
Chi-squared	0.17	0.45	0.056
Kruskal-Wallis'	0.4	0.25	0.64
One-way ANOVA	0.37	0.225	0.63
Levene's	0.06	0.004	0.004

Table 14: *Age influence*

TEST	attitudine_all	intenzione_all	disponibilità_all	consapevolezza_all	conoscenza_all
Chi-squared	0.03	0.14	0.004	0.18	0.08
Kruskal-Wallis'	0.0005	0.072	0.008	0.0065	0.1
One-way ANOVA	0.0002	0.032	0.004	0.057	0.075
Levene's	0.09	0.13	0.23	0.45	0.22

Table 15: *Education influence*

TEST	attitudine_all	intenzione_all	disponibilità_all
Chi-squared	0.48	0.82	0.22
Kruskal-Wallis'	0.73	0.43	0.45
One-way ANOVA	0.83	0.42	0.26
Levene's	0.59	0.92	0.35

Table 16: *Profession influence*

Contrast type	Contrast sign	Contrast p-value attitudine_all	Contrast p-value intenzione_all	Contrast p-value disponibilità_all	Contrast p-value consapevolezza_all
Scuola superiore vs Laurea magistrale o Dottorato	Negative	0.006			
Scuola superiore vs Laurea triennale	Negative	0.000	0.067		
Scuola superiore vs Formazione intermedia	Negative			0.009	0.07

Table 17: *Pairwise comparison of means results*

Note that the two values of **0.067** and **0.07** have been accepted as significative, even if they are higher than alpha 0.05, in order to explain which groups of education level were slightly more different in their values of “intenzione_all” and “consapevolezza_all”.

5.7 Regression

Provided that, for the purposes of this thesis, *regression* will be carried out, it is important to mention some general, theoretical concepts of econometrics. In fact, Stata performs the *Ordinary Least Squares Regression (OLS)* to estimate the unknown effect obtained by changing one variable over another one. OLS is a method for estimating the coefficients of linear regression equations, describing the relationship between one or more independent variables and a dependent one (“Ordinary least squares”, 2022). This technique follows the principle of *least squares*: it consists in minimizing the sum of the squares of the differences between the observed dependent variables and those predicted by the linear function of the independent variable (“Ordinary least squares”, 2022).

In order to provide consistent and reliable results, OLS estimator needs the validity of some assumptions. Part of them grant the basic validity of the model, some others are used to obtain specific statistical properties for any estimator (Ghosh, 2022).

- Linearity in parameters
- Random sampling of observations
- No endogeneity, which means “there should be no relationship between the errors and the independent variables.” (Valchanov, 2018)
- No multi-collinearity
- Errors are normally distributed
- Homoscedasticity, that means constant variance
- No autocorrelation, that means the covariance of any two error terms is zero

In particular, multiple regression is carried out for each dependent variable, being “attitudine_all”, “intenzione_all” and “disponibilità_all”, with respect to the independent mediators “consapevolezza_all” and “conoscenza_all”. A positive influence is expected, and it will be demonstrated using the command *regress* on Stata.

The output of regression on Stata is quite dense, therefore it is meaningful to provide some clarifications on the objects contained.

Total variance is divided into the variance which can be explained by the independent variables (Model) and the variance which cannot be explained by them (Residual) (“Regression analysis. Stata annotated output”, 2022).

- **SS**: Sum of Squares linked to the three sources of variance, Total, Model and Residual. SSTotal is the total variability around the mean; SSResidual represents the sum of

squared errors in prediction; SSModel shows the improvement in prediction thanks to the predicted value of Y with respect to the mean of Y. It is possible to think of it as $SSModel = SSTotal - SSResidual$ (“Regression analysis. Stata annotated output”, 2022).

- **df**: degrees of freedom for each source of variance, being N-1 for the Total Variance.
- **MS**: Mean Squares, as the Sum of Squares divided by their respective degrees of freedom (“Regression analysis. Stata annotated output”, 2022).
- **F and Prob > F**: F is the Mean Square Model divided by the Mean Square Residual. The p-value associated is Prob > F and it must be compared to the defined alpha level (typically 0.05) and if it is smaller, it is possible to state that the group of *independent variables reliably predicts the dependent one* (“Regression analysis. Stata annotated output”, 2022).
- **R-squared and Adj R-squared**: R-Squared is the portion of variance in the dependent variable which can be predicted and explained by the independent variables, in turn it is considered a measure of model accuracy (“Regression analysis. Stata annotated output”, 2022). Instead, Adjusted R-square attempts to provide a more precise value of R-squared, adjusted for the number of predictors used (“Regression analysis. Stata annotated output”, 2022).
- **Root MSE**: stands for the standard deviation of the error term.
- **Std. Err.**: standard errors of the coefficients.
- **t and P>|t|**: these provide the t-value and the associated p-value. Coefficients with p-values lower than alpha are *statistically significant* (“Regression analysis. Stata annotated output”, 2022).
- **[95% Conf. Interval]**: it helps to understand the range of possible values that actual parameters may assume. The coefficient will not be statistically significant if the confidence interval includes zero (“Regression analysis. Stata annotated output”, 2022).

A first regression is done for “*attitudine_all*”, considering the combined effect of the two independent variables “*consapevolezza_all*” and “*conoscenza_all*”.

Looking at the value Prob > F, being the p-value so small to be approximated to zero and lower than alpha 0.05, it is possible to state that the group of independent variables reliably predicts the dependent one.

R squared is 34.4% and the adjusted version 33.9%: about 34% of “*attitudine_all*”’s variance can be predicted by the independent variables.

. regress attitudine_all consapevolezza_all conoscenza_all

Source	SS	df	MS	Number of obs	=	264
Model	52.3902962	2	26.1951481	F(2, 261)	=	68.55
Residual	99.7422795	261	.382154328	Prob > F	=	0.0000
				R-squared	=	0.3444
				Adj R-squared	=	0.3393
Total	152.132576	263	.578450858	Root MSE	=	.61819

attitudine_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
consapevolezza_all	.6017224	.0705818	8.53	0.000	.4627402	.7407047
conoscenza_all	.2215376	.0382388	5.79	0.000	.1462417	.2968334
_cons	.8711157	.3093423	2.82	0.005	.2619914	1.48024

Table 18: *Regression for attitudine_all*

The two coefficients are **0.6** and **0.22**: being higher than zero, they show a positive influence of “consapevolezza_all” and “conoscenza_all” on “attitudine_all”. The more aware and informed consumers about sustainability, the more positive would be their attitude towards the company. In turn, the null hypothesis of the coef. = 0 must be rejected as the associated p-values are so small to be approximated to zero. Instead, the constant term equal to 0.87 (the y-axis intercept) cannot be considered null as its p-value is $0.005 < 0.05$. In other words, all 95% confidence intervals do not contain zero.

Moreover, some *interaction terms* of “consapevolezza_all” and “conoscenza_all” with gender, age, level of instruction and type of profession are included in the models: if they result statistically significant, it means that the effect of “consapevolezza_all” and “conoscenza_all” on the dependent variable also depends on the value of such demographic variables and viceversa. The coefficient of the interaction term represents the intensity of such combined effect. In addition to this, the coefficients of “consapevolezza_all” and “conoscenza_all” previously found will be affected as well.

The interaction term “consapevolezza_all*conoscenza_all” is not significant but it is highly correlated to the variable “conoscenza_all”.

Gender has a positive and statistically significant effect on attitude (coef. = **2.14** and p-value approximated to zero) only when including in the model its negative interaction with the *environmental and social awareness*, with a significant coefficient of **-0.46** (Table 19). In other words, the principal effect is significant only if combined to its interaction term. The significance of the latter means that the total effect of gender on “attitudine_all” depends on

environmental and social awareness, and viceversa. In particular, the binary variable “genere_num”, defined to include gender as a regressor, takes on a value of 1 for men and 0 for women. As a result, attitude increases only for men by a quantity equal to 2.14, which is decreased by an interaction factor equal to $-0.46 * \text{“consapevolezza_all”}$. This would be greater, negatively, the more awareness takes higher values. However, men showed to have a lower medium awareness than women.

Instead, for women, when “genere_num” = 0, the model is reduced to the simple one including only “consapevolezza_all” and “conoscenza_all”, as both the principal effect of “genere_num” and the interaction term are nullified.

However, the coefficients of “consapevolezza_all” and “conoscenza_all” become **0.8** and **0.3**, respectively: the interaction of gender and awareness triggers an increase of their positive effect on the dependent variable. In such model, the independent variables can explain almost 39% of “attitudine_all” total variance (R squared).

For what concerns age, young people seem to have a slightly negative effect on “attitudine_all”.

The *level of education* has a positive, significant coefficient of **0.1** when considered as principal effect in isolation: the highest levels of education, like bachelor’s and master’s degrees, tend to contribute more to build a positive attitude than lower levels (*Table 20* upper table). In this case, the coefficients of the independent variables “consapevolezza_all” and “conoscenza_all” take values of 0.6 and 0.21 respectively, basically confirming the previous ones.

However, its interaction with awareness is statistically relevant but negative (coef. = **-0.2**). It means that the overall effect of education level on “attitudine_all” also depends on *environmental and social awareness*, and viceversa. In other words, it can be said that the higher education levels, the more positive attitude towards the company, decreased by an interaction factor ($-0.2 * \text{“istruzione”} * \text{“consapevolezza_all”}$), which grows negative for higher values of education and awareness. Also, for higher levels of education, the positive principal effect of environmental and social awareness (now being **1.15 * “consapevolezza_all”**) is counterbalanced by a larger negative factor resulting from interaction (for instance, $-0.2 * 3 * \text{“consapevolezza_all”}$ for bachelor’s degree, while $-0.2 * 2 * \text{“consapevolezza_all”}$ for high school).

In turn, by including the interaction “consapevolezza_all*istruzione” in the model, education level’s coefficient grows from 0.1 to **1** (*Table 20*), while the coefficients of “consapevolezza_all” and “conoscenza_all” become **1.15** and **0.25**, respectively: the

interaction of education level and awareness triggers an increase of their positive effects on the dependent variable.

Indeed, in both models with interaction, for gender and education, the coefficients of “consapevolezza_all” and “conoscenza_all”, taken as principal effects, remain positive and significative.

The portion of explained variance, represented by R squared, become almost equal to 38%.

The type of profession does not show interesting influences.

Below, the reader may find Stata outputs of significative regressors.

```
. regress attitudine_all consapevolezza_all conoscenza_all genere_num
```

Source	SS	df	MS	Number of obs	=	261
Model	52.8487919	3	17.616264	F(3, 257)	=	46.09
Residual	98.2278365	257	.38220948	Prob > F	=	0.0000
				R-squared	=	0.3498
				Adj R-squared	=	0.3422
Total	151.076628	260	.581063955	Root MSE	=	.61823

attitudine_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.5794981	.0728468	7.96	0.000	.4360454 .7229508
conoscenza_all	.2304049	.0387717	5.94	0.000	.1540542 .3067555
genere_num	-.110511	.0816868	-1.35	0.177	-.2713716 .0503497
_cons	.9835784	.3225804	3.05	0.003	.3483411 1.618816

```
. regress attitudine_all consapevolezza_all conoscenza_all genere_num intera_cons_gen intera_cono_gen
```

Source	SS	df	MS	Number of obs	=	261
Model	58.3284156	5	11.6656831	F(5, 255)	=	32.07
Residual	92.7482128	255	.363718482	Prob > F	=	0.0000
				R-squared	=	0.3861
				Adj R-squared	=	0.3740
Total	151.076628	260	.581063955	Root MSE	=	.60309

attitudine_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.7996058	.1012681	7.90	0.000	.6001774 .9990341
conoscenza_all	.2684463	.0535972	5.01	0.000	.1628969 .3739958
genere_num	2.14428	.6164254	3.48	0.001	.9303474 3.358214
inter_a_cons_gen	-.4570099	.1424751	-3.21	0.002	-.7375877 -.1764321
inter_a_cono_gen	-.0963269	.0758433	-1.27	0.205	-.2456858 .053032
_cons	-.1014938	.4376415	-0.23	0.817	-.9633458 .7603581

Table 19: *Effect of gender*

. regress attitudine_all consapevolezza_all conoscenza_all istruzione_num

Source	SS	df	MS	Number of obs	=	264
Model	54.3573728	3	18.1191243	F(3, 260)	=	48.18
Residual	97.775203	260	.376058473	Prob > F	=	0.0000
				R-squared	=	0.3573
				Adj R-squared	=	0.3499
Total	152.132576	263	.578450858	Root MSE	=	.61324

attitudine_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.5966977	.0700511	8.52	0.000	.458758 .7346373
conoscenza_all	.2167492	.0379903	5.71	0.000	.1419413 .2915572
istruzione_num	.0952079	.0416284	2.29	0.023	.0132361 .1771797
_cons	.6305362	.3243937	1.94	0.053	-.0082371 1.269309

. regress attitudine_all consapevolezza_all conoscenza_all istruzione_num intera_cons_istr intera_cono_istr

Source	SS	df	MS	Number of obs	=	264
Model	57.300535	5	11.460107	F(5, 258)	=	31.18
Residual	94.8320408	258	.36756605	Prob > F	=	0.0000
				R-squared	=	0.3766
				Adj R-squared	=	0.3646
Total	152.132576	263	.578450858	Root MSE	=	.60627

attitudine_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	1.15041	.2176073	5.29	0.000	.7218978 1.578923
conoscenza_all	.249624	.116775	2.14	0.033	.0196705 .4795774
istruzione_num	1.0195	.3294779	3.09	0.002	.3706913 1.668308
intera_cons_istr	-.1984733	.0738753	-2.69	0.008	-.3439485 -.052998
intera_cono_istr	-.0110712	.0384953	-0.29	0.774	-.0868763 .0647339
_cons	-1.948492	.9667669	-2.02	0.045	-3.852251 -.0447337

Table 20: *Effect of education level*

Secondly, the dependent variable “*intenzione_all*” is analyzed.

Looking at the value Prob > F, being the p-value equal approximated to zero and lower than alpha 0.05, it is possible to state that the group of independent variables reliably predicts the dependent one.

R squared is 29.7% and the adjusted version 29.2%: about 29% of “*intenzione_all*”’s variance can be predicted by the independent variables.

The two coefficients are **0.5** and **0.31**: being higher than zero, they show a positive influence of “*consapevolezza_all*” and “*conoscenza_all*” on “*intenzione_all*”. In turn, the null hypothesis of $\text{coef.} = 0$ must be rejected as the associated p-values are so small to be approximated to zero. The more aware and informed consumers about sustainability, the more positive would be their purchasing intention for labelled apparel. Instead, the constant can be considered null as its p-value is $0.113 > 0.05$. In other words, the 95% confidence intervals do not contain zero for the two coefficients, while they do for the constant.

Moreover, the interaction “consapevolezza_all*conoscenza_all” is not significative but it is highly correlated to the two dependent variables, in particular to “conoscenza_all”.

Gender has no relevant influence as a regressor for “intenzione_all”.

For what concerns *age*, the related principal effect alone is not significative in the simple model (Table 22). Only the interaction term “conoscenza_all*età” has a sufficiently low p-value and a positive, statistically significant coefficient of **0.16** (Table 23). However, by including this interaction in the model, all principal effects are nullified and become not significant, as shown in Table 23. It can be said that the dependent variable “intenzione_all” grows with age by a factor which is greater the more “conoscenza_all” takes high values. Viceversa, the positive effect of “conoscenza_all” on “intenzione_all” is greater the more age takes higher values (for instance, $0.16 * 2 * \text{“conoscenza_all”}$ for the group 25-34 years old and $0.16 * 3 * \text{“conoscenza_all”}$ for the group 35-64 years old).

Furthermore, R-squared grows to 32%, which means that the independent variables included in this model are able to explain a larger portion of variance.

The level of education and the type of profession are not significative.

```
. regress intenzione_all consapevolezza_all conoscenza_all
```

Source	SS	df	MS	Number of obs	=	264
Model	58.1849198	2	29.0924599	F(2, 261)	=	55.16
Residual	137.646733	261	.527382119	Prob > F	=	0.0000
				R-squared	=	0.2971
				Adj R-squared	=	0.2917
Total	195.831653	263	.744607045	Root MSE	=	.72621

intenzione_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.4981754	.0829156	6.01	0.000	.3349068 .661444
conoscenza_all	.3126156	.0449208	6.96	0.000	.2241622 .4010689
_cons	.5773351	.3633981	1.59	0.113	-.1382302 1.2929

Table 21: Regression for intenzione_all

```
. regress intenzione_all consapevolezza_all conoscenza_all età_num
```

Source	SS	df	MS	Number of obs	=	255
Model	56.1905258	3	18.7301753	F(3, 251)	=	35.32
Residual	133.101852	251	.530286265	Prob > F	=	0.0000
				R-squared	=	0.2968
				Adj R-squared	=	0.2884
Total	189.292378	254	.745245584	Root MSE	=	.72821

intenzione_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.5098187	.0853658	5.97	0.000	.3416942 .6779432
conoscenza_all	.3156305	.0472224	6.68	0.000	.2226278 .4086332
età_num	.0031396	.0670881	0.05	0.963	-.1289877 .1352668
_cons	.495563	.3943667	1.26	0.210	-.2811266 1.272253

Table 22: Single principal effect of age

. regress intenzione_all consapevolezza_all conoscenza_all età_num intera_cons_età intera_cono_età

Source	SS	df	MS	Number of obs	=	255
Model	61.3817868	5	12.2763574	F(5, 249)	=	23.90
Residual	127.910592	249	.513697155	Prob > F	=	0.0000
				R-squared	=	0.3243
				Adj R-squared	=	0.3107
Total	189.292378	254	.745245584	Root MSE	=	.71673

intenzione_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.2406418	.2431794	0.99	0.323	-.238309 .7195926
conoscenza_all	.0125913	.1310642	0.10	0.924	-.2455445 .2707271
età_num	-1.035349	.5818338	-1.78	0.076	-2.181292 .1105944
intera_cons_età	.1479396	.1388756	1.07	0.288	-.125581 .4214603
intera_cono_età	.1644592	.0699651	2.35	0.020	.0266604 .302258
_cons	2.377096	1.0519	2.26	0.025	.3053396 4.448852

Table 23: Effect of interaction age-knowledge

Finally, the variable “*disponibilità_all*” has been the object of regression.

Looking at the value Prob > F, being the p-value approximated to zero and lower than alpha 0.05, it is possible to state that the group of independent variables reliably predicts the dependent one.

R squared is 30.9% and the adjusted version 30.3%: about 30% of “*disponibilità_all*”’s variance can be predicted by the independent variables.

The two coefficients are **0.61** and **0.31**: being higher than zero, they show a positive influence of “*consapevolezza_all*” and “*conoscenza_all*” on “*disponibilità_all*”. In turn, the null hypothesis of coef. = 0 must be rejected as the associated p-values are both approximated to zero. The more aware and informed consumers about sustainability, the more they would be willing to pay a premium for sustainability. Instead, the constant can be considered null as its p-value is 0.64 > 0.05. In other words, the 95% confidence intervals do not contain zero for the two coefficients, while they do for the constant.

. regress disponibilità_all consapevolezza_all conoscenza_all

Source	SS	df	MS	Number of obs	=	261
Model	69.3872884	2	34.6936442	F(2, 258)	=	57.59
Residual	155.423056	258	.602414947	Prob > F	=	0.0000
				R-squared	=	0.3086
				Adj R-squared	=	0.3033
Total	224.810345	260	.864655172	Root MSE	=	.77615

disponibilità_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.6090046	.0887791	6.86	0.000	.4341808 .7838285
conoscenza_all	.3080194	.0481104	6.40	0.000	.2132803 .4027586
_cons	-.1821582	.3892786	-0.47	0.640	-.9487261 .5844097

Table 24: Regression for *disponibilità_all*

Moreover, the interaction “consapevolezza_all*conoscenza_all” is not significative but it is highly correlated to the variable “conoscenza_all”.

Gender is not a relevant regressor.

For what concerns *age*, the related principal effect is not significative alone in the simple model (Table 25). Only the interaction term “conoscenza_all*età” has a sufficiently low p-value and a positive coefficient of **0.17** (Table 26). However, by including this interaction in the model, all principal effects are nullified and become not significant, as shown in Table 25. It can be said that the dependent variable “disponibilità_all” grows with age by a factor which is greater the more “conoscenza_all” takes high values. Viceversa, the positive effect of “conoscenza_all” on “disponibilità_all” is greater the more age takes higher values (for instance, $0.17 * 2 * \text{“conoscenza_all”}$ for the group 25-34 years old and $0.17 * 3 * \text{“conoscenza_all”}$ for the group 35-64 years old)

From Table 26, it can be noticed that the portion of variance which is explained by the independent variables grows to 33% (R squared).

In the end, level of education and type of profession do not show interesting influences.

```
. regress disponibilità_all consapevolezza_all conoscenza_all età_num
```

Source	SS	df	MS	Number of obs	=	252
Model	66.5180752	3	22.1726917	F(3, 248)	=	36.61
Residual	150.207123	248	.605673884	Prob > F	=	0.0000
				R-squared	=	0.3069
				Adj R-squared	=	0.2985
Total	216.725198	251	.863447006	Root MSE	=	.77825

disponibilità_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.6037419	.0914076	6.60	0.000	.4237076 .7837762
conoscenza_all	.3204538	.0505488	6.34	0.000	.2208942 .4200134
età_num	-.0784006	.071958	-1.09	0.277	-.2201274 .0633261
_cons	-.0686121	.4226841	-0.16	0.871	-.9011204 .7638963

Table 25: Single principal effect of age

```
. regress disponibilità_all consapevolezza_all conoscenza_all età_num intera_cons_età intera_cono_età
```

Source	SS	df	MS	Number of obs	=	252
Model	71.140302	5	14.2280604	F(5, 246)	=	24.04
Residual	145.584896	246	.591808522	Prob > F	=	0.0000
				R-squared	=	0.3283
				Adj R-squared	=	0.3146
Total	216.725198	251	.863447006	Root MSE	=	.76929

disponibilità_all	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
consapevolezza_all	.4303279	.261103	1.65	0.101	-.0839547 .9446106
conoscenza_all	.0068735	.1409933	0.05	0.961	-.2708346 .2845816
età_num	-.8747343	.6253059	-1.40	0.163	-2.106371 .356902
inter_a_cons_età	.0898189	.1491614	0.60	0.548	-.2039776 .3836153
inter_a_cono_età	.1719294	.0752056	2.29	0.023	.0238004 .3200585
_cons	1.408552	1.130614	1.25	0.214	-.8183664 3.635471

Table 26: Effect of interaction age-knowledge

The following tables summarize the significant coefficients obtained with multiple regression.

REGRESSOR	COEFFICIENT		
	attitudine_all	intenzione_all	disponibilità_all
consapevolezza_all	0.6	0.5	0.61
conoscenza_all	0.22	0.31	0.31
consapevolezza_all * conoscenza_all	Not significant	Not significant	Not significant

Table 27: Regression results

REGRESSOR	COEFFICIENT		
	attitudine_all	intenzione_all	disponibilità_all
genere	2.14		
genere * consapevolezza_all	-0.46		
età * conoscenza_all		0.16	0.17
istruzione	0.1		
istruzione* consapevolezza_all	-0.2		

Table 28: Regression results-demographics

6. Discussion

It is clear how consumers feel the urge of purchasing from transparent, ethical and sustainable fashion companies. Several reports state that sustainability and transparency are driving the greatest change towards a greener apparel industry, as a response to these latest trends (Byrd et al., 2021).

More sensible customers need to be informed about product's origins, production methods, social and environmental impacts, in turn raising their trust and loyalty. Therefore, fashion companies are expected to provide "information to consumers regarding how to care for their garments to create a more sustainable future" (Byrd et al., 2021).

Apparel and accessories' labelling constitutes an effective way through which they can learn and make conscious purchasing choices (Byrd et al., 2021). However, consumers must have a basic knowledge of social and environmental issues in order to go in such direction and change their purchasing habits (Byrd et al., 2021). Literature shows that they are not so familiar with "sustainable apparel labels or their meanings" and the most common sustainable practices in the fashion industry (Byrd et al., 2021). Therefore, it is crucial that companies devolve their efforts to consumer's education and eco-labelling programs' promotion (Byrd et al., 2021).

Previous research shows that consumers have positive feelings towards sustainability, even with a lack of specific knowledge, but they are "not willing to sacrifice price and style for responsible apparel items" in general (Byrd et al., 2021).

Overall, it was found that fashion companies may get benefits, both economic and reputational, from the use of eco-labelling to influence and stress consumer behavior (Byrd et al., 2021). They must leverage on consumer's feeling of making a difference when contributing to reduce the impact of the fashion industry (Byrd et al., 2021).

This thesis suggests a positive influence of certified eco-labels on consumer's attitude towards fashion companies, purchase intention and willingness to pay a premium for sustainability. The communication of sustainable actions via eco-labels boosts consumer perception of the firm itself, inducing purchasing actions towards green products, even if they are more expensive than traditional alternatives. Therefore, fashion companies may balance and repay their sustainability efforts and investments by setting higher prices.

Patterns of mutual dependence and differences among certain groups of respondents, in terms of means and medians of the analyzed variables, arise, especially when considering gender and education level.

Moreover, the influence of social and environmental awareness and certified eco-labels' knowledge among consumers has been analyzed.

Respondents seemed to be quite aware of Fashion industry's impacts but have no specific knowledge of certified eco-labels. This remarks again the importance of consumer's education about the matter.

In addition, results show that two mediating factors are significative and positively affect consumer behavior, expressed through his attitude towards fashion companies, his purchase intention and willingness to pay a premium for sustainability. The more consumers are informed both about environmental and social issues associated to the textile and apparel industry, and about labelling, the more positively consumer behavior is affected. Interaction terms with demographic variables, such as gender, age, level of education and type of profession, have been included in the regression model and some proved to be significant.

By comparing this analysis with the one carried out by Rutten (2022), the same results have been achieved, with respect to the positive influence of certified eco-labels on consumer's attitude towards fashion companies, purchase intention and willingness to pay a premium for sustainability. Furthermore, the influence of the two mediators, social and environmental awareness and certified eco-labels' knowledge, was proven to be positive also by Rutten.

The only difference lays in the fact that Rutten's respondents were not willing to pay premium prices for labelled clothing, while fashion consumers who answered to this survey are. To conclude, Rutten did not study the effect of interactions, while these have been included in the regression models of "attitudine_all", "intenzione_all" and "disponibilità_all".

One limitation of this study is the absence of a variable representing *income*, which may be related to the willingness to pay a premium for sustainability. Another constraint is the use of a sample which cannot be treated as random. In fact, the survey has been shared on social networks and reached people with similar interests or perspectives, possibly generating an over-representation of some aspects. Moreover, the survey was available in Italian only, which cuts out of the sample foreign people not speaking Italian.

6.1 Attitude towards the company

This paper hints that the use of certified eco-labels on clothing and accessories has a *positive effect* on consumer's attitude towards the company making such use on its products. Attitude

and *gender* seem to be dependent. In particular, women seem to have a more positive attitude towards companies which use certified eco-labels than men.

Attitude and *education level* seem to be dependent. Respondents who belong to different education levels groups show divergences as well: people who attended high school shows the greatest difference with respect to those who got a degree, both bachelor's and master's, with the latter showing a better attitude towards fashion companies which use certified eco-labels.

Regression analysis shows how the dependent variable “attitudine_all” is *positively* influenced by “consapevolezza_all” and “conoscenza_all”. *Gender* has a positive and significant effect on attitude only in presence of its negative interaction with the *environmental and social awareness*: the overall effect of gender on “attitudine_all” depends on environmental and social awareness, and viceversa. In particular, attitude increases only for men by a quantity equal to 2.14, which is decreased by an interaction factor equal to $-0.46 * \text{“consapevolezza_all”}$. This would be greater, negatively, the more awareness takes higher values. For women, both the principal effect of “genere_num” and its interaction term are nullified, so the model would include “consapevolezza_all” and “conoscenza_all” only, with higher positive coefficients.

For what concerns age, young people seem to have a slightly negative effect on “attitudine_all”. The *level of education* also has a positive effect: the highest levels of education tend to contribute more to build a positive attitude. However, its interaction with awareness is relevant but negative. In turn, the overall effect of education level on “attitudine_all” depends also on environmental and social awareness, and viceversa. In other words, the higher education levels, the more positive attitude towards the company, decreased by an interaction factor which grows negative for higher education levels and awareness. Also, for higher levels of education, the positive principal effect of environmental and social awareness is counterbalanced by a larger negative factor resulting from interaction.

6.2 Purchase intention

Results suggested an overall *positive* purchase intention of consumers towards clothing and accessories with certified eco-labels. This means that companies investing in sustainability and using eco-labels to communicate such efforts will be chosen by fashion consumers.

In particular, respondents who belong to different education levels groups show divergences: people who attended high school shows a slight difference with respect to those who got a bachelor's degree, with the latter being keener to purchase labelled clothing.

Regression analysis shows how the dependent variable “intenzione_all” is *positively* influenced by “consapevolezza_all” and “conoscenza_all”. For what concerns *age*, the related principal

effect is not significant in the simple model. Only the interaction term “conoscenza_all*età” is positive and significant. By including this interaction in the model, all principal effects are nullified and become not significant. However, the dependent variable “intenzione_all” grows with age by a factor which is greater the more “conoscenza_all” takes high values.

6.3 Willingness to pay a premium

Surprisingly, this research shows that consumers were willing to pay a premium for clothing and accessories with certified eco-labels. This constitutes an important result for companies: they may set *higher prices* to justify their sustainability efforts.

In particular, respondents who belong to different *education levels* groups show divergences as well: people who attended high school shows the greatest difference with respect to those who attended professional schools, with the latter being more willing to pay for sustainability. Willingness to pay a premium for sustainability and *age* show a pattern of mutual dependence, as willingness to pay a premium for sustainability and *education level*.

Regression analysis shows how the dependent variable “disponibilità_all” is *positively* influenced by “consapevolezza_all” and “conoscenza_all”. For what concerns *age*, the related principal effect is not significant alone in the simple model. Only the interaction term “conoscenza_all*età” is positive and statistically significant. By including this interaction in the model, all principal effects are nullified and become not significant. However, it can be explained how the dependent variable “disponibilità_all” grows with age by a factor which is greater the more “conoscenza_all” takes high values.

6.4 Awareness about environmental and social impacts

Respondents were *strongly aware* about the harmful effects of Fashion industry’s industrial practices, both social and environmental.

Awareness and *gender* present a pattern of mutual dependence. Men and women present significant differences, with the second being more aware than the first group. Looking at the *level of education*, people who have an intermediate education seem more aware than those who attended high school, surprisingly. Instead, no significant differences arise among the types of profession.

Multiple regression proved that awareness of impacts is a *significantly positive regressor* for “attitudine_all”, “intenzione_all” and “disponibilità_all”.

6.5 Knowledge about certified eco-labels

As commonly found by previous research papers, respondents did *not have much knowledge* and experience about certified eco-labels, with no differences between men and women. *Age* and knowledge show a pattern of mutual dependence, and the groups have slightly different means as well: roughly computed, the largest difference is between 18-24 (mean = 2.1) and 35-44 years old classes (mean = 2.7). However, no significant differences arise among the other groups, considering education level and type of profession.

Multiple regression proved that knowledge of eco-labels is a *significantly positive regressor* for “attitudine_all”, “intenzione_all” and “disponibilità_all”.

7. Conclusion

Consumers are developing a new sensibility, animated by the profound concern for environmental and social safety. This is particularly true for the Fashion industry, being one of the most impacting and polluting. Companies are expected to respond to such change with greener products, more transparent, circular closed-loop supply chains and CSR initiatives. This is crucial to preserve their competitive advantage in a competitive and dynamic market such as the Fashion one.

Slow Fashion constitutes the key to change the future of the industry. In order to succeed, Fashion need to be redefined and consumer behavior to be changed (Mandaric' et al., 2022), in light of creativity and collaboration, guiding a revolution of the whole system (Mandaric' et al., 2022). Fast Fashion must be completely eradicated, to leave room for a radical change of mindset, for both businesses and consumers (Mandaric' et al., 2022). Overproduction and overconsumption will be replaced by quality's prioritization over quantity, organic and traced raw materials, reuse and recycle practices, as well as concern for ethical supply chains (Mandaric' et al., 2022).

The need to communicate transparently and inform customers about fashion companies' sustainable actions may be satisfied through the use of certified eco-labels, which seem to be more credible than general ones, as a result of the external certification they receive. This aspect has a role in diminishing the amount of confusion and skepticism in the market.

The research carried out in this thesis suggests how eco-labels may be considered an effective communication tool, positively driving consumer behavior and decisions, with particular attention to the potentially higher price level for green products, which consumers seem willing to accept. This happens even more in presence of aware and informed customers, about textile industry's impacts and eco-labels.

The results of this analysis may be relevant for fashion companies, in order to understand the importance of consumer education, which may be done using social media and online channels, and certified eco-labels promotion. People need to understand labels' role and meaning to defeat a general tendency of skepticism, driven by greenwashing's emergence. In fact, companies must communicate transparently their concrete actions in favor of sustainability, in order to build trust and loyalty among consumers.

Moreover, by taking into consideration this analysis, companies may be encouraged to integrate sustainability into their business, considering the positive effect of eco-labels on consumers' willingness to pay a price premium for sustainability.

Further research on this topic may consider the effect of income, as well as addressing a larger and more randomized sample of individuals, not limited to Italian speakers.

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