MSc. Thesis Digital Marketing

Decoding the Green Seal: How Eco-Labels Influence Perceived Quality in Fashion

The influence of eco-labels on consumers' perceptions of product quality in the fashion industry, exploring how perceived eco-label credibility mediates this relationship

Dion te Lintelo – s2392267

30 October 2024

Supervisor

Dr. J. Karreman

Second reader

Dr. A. Leszkiewicz

Department of Communication Science/Business Administration
Faculty of Behavioral, Management and Social Sciences at the University of Twente

ABSTRACT

This thesis examines how eco-labels influence consumers' perceived quality of clothing, with a focus on the mediating role of perceived eco-label credibility. Using signaling theory, the research distinguishes between Type I (certified) and Type II (non-certified) eco-labels to explore their impact on consumer perceptions in the fashion industry. Initially, a quantitative 3 x 2 experimental design was implemented with 111 Dutch participants who evaluated two clothing products (T-shirt and blazer) featuring either a certified, non-certified, or no eco-label. However, since no significant differences were found between the clothing products across the label types, the analysis was simplified to a 3 x 1 experimental design, combining the two products into a single group. One-way ANOVA and mediation analyses were used to assess the relationships between eco-label types, perceived quality, and the mediating effect of credibility. The study highlights the critical role of eco-label credibility, as only certified labels showed a significant mediation effect on perceived quality. The results revealed that both certified and non-certified eco-labels positively affect perceived quality, with certified labels perceived as more credible and thereby driving higher quality perceptions. This research contributes to signaling theory, emphasizing the importance of eco-label credibility. Practical recommendations include the need for third-party certifications and transparent communication strategies by clothing brands and policymakers. Future research should broaden the scope of eco-labels examined, introduce interactive elements, and extend product categories to capture more diverse consumer behaviors in sustainable clothing consumption.

Keywords: certified eco-labels, non-certified eco-labels, perceived quality, perceived eco-label credibility, signaling theory, consumer behavior, sustainable consumption, fashion industry

PREFACE

You are about to read my thesis, written as part of the completion of my Double Degree Master Digital Marketing (Master Communication Science and Master Business Administration) program at the University of Twente. The process of writing this thesis has been both challenging and educational, allowing me to develop my research and writing skills while also teaching me valuable lessons about myself.

I would like to thank my initial first supervisor, Letizia Alvino, for her insightful feedback and guidance throughout this project. Additionally, I would like to thank Joyce Karreman, as my first supervisor, for her pleasant and helpful guidance in the final phase of this project. I also extend my sincere thanks to all the participants in my study for their time and cooperation.

Finally, I would like to thank my parents, Rob and Elvera, for their unconditional support and encouragement throughout the process of writing this thesis. I would also like to extend my thanks to the rest of my family and friends for their continued support during this project.

I hope that my research will contribute to the field and provide new insights for future studies.

Enschede, 30 October 2024

Dion te Lintelo

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Problem background

For years the fashion industry has been significantly impacted by ecological and social issues, such as CO^2 emissions, textile waste, and labor exploitation (Lui et al., 2017; Niinimäki et al., 2020). These problems have been recognized by several government authorities, including the European Parliament. They have developed a vision that by 2030, textiles within the EU market should be durable and recyclable, largely made of recycled materials, and produced in an environmentally friendly way while respecting social rights. The concept of fast fashion should diminish, while accessibility to reuse and repair services should expand (European Parliament, 2024). Nevertheless, for now, this vision is still far from becoming reality.

While an increasing number of consumers are striving to consume more sustainable, consumers' attitudes do often not align with their behavior (Ceylan, 2019). Furthermore, many consumers are unaware of their significant role in mitigating the environmental damage stemming from production chains. Indeed, by influencing the demand for specific product attributes, consumers determine which products are manufactured and how (Yokessa & Marette, 2019). In order to bridge the 'attitude-behavior gap' and assist consumers in choosing green goods and services (i.e. sustainable purchasing decisions), the use of eco-labels has emerged as an effective marketing strategy (Testa et al., 2013).

Eco-labels serve as green marketing tools or signals, that fulfill a dual purpose of communicating information and promoting ecological innovation (Delmas & Gerguad, 2021; Feuβ et al., 2022). Physically, a label can take the form of a simple hang tag, sew in label or a crafted image integrated into the packaging that may contain details about the product (Kotler & Keller, 2011; Byrd & Su, 2020). This research focuses on Type I (certified) eco-labels and Type II (non-certified) eco-labels as these show to be gaining ground in the fashion industry (Brach et al., 2017; Ranasighne & Jayasooriya, 2021). Type I eco-labels are verified by third

parties or public authorities, whereas Type II eco-labels are self-declared by companies without official verification. Hence, they serve as the independent variables under examination.

With regard to sustainable consumption, previous research has shown that eco-labels can serve as powerful tools for promoting sustainable products, particularly in markets characterized by information asymmetry. Thereby, they have been proven to effectively shape consumer purchasing decisions (Aertsens et al., 2011; Smith & Paladino, 2010; Yau, 2012; Wojnaroska et al., 2021; Feuβ et al., 2022). Despite their potential, there is still little understanding of what exactly motives consumers to purchase products with an eco-label and how consumers perceive the quality of products with different types of eco-labels (Feuβ et al., 2022). Consequently, the impact of different types of eco-labels on consumer behavior in the fashion industry remains understudied, specifically when focused on perceived product quality, which functions as the dependent variable in this study. Examining perceived product quality in response to eco-labels holds significance, as favorable consumer perceptions of quality correlate with purchasing behaviors, consumer attitudes, satisfaction levels, and intentions for re-purchase (Schumacher, 2010; Das, 2015; Zhoa et al., 2022).

To further substantiate the relationship between type of eco-labels and perceived quality, this study will utilize signaling theory, which provides a robust framework. Signaling theory focuses on the presence of information asymmetry between two parties in a market exchange (Spence, 1973) and examines strategies to reduce this asymmetry through signaling (Connelly et al., 2011). In this regard, the signal is the type of eco-label. According to signaling theory, the influence of different types of eco-labels on perceived quality can be attributed to the perceived credibility that consumers associate with them. Perceived eco-label credibility can be defined as the belief consumers have regarding the trustworthiness, reliability, and authenticity of the information conveyed by eco-labels (Moussa & Touzani, 2008). Indeed,

previous research supported by signaling theory suggests that there is a significant relationship between the credibility of a signal and consumers' perception of product quality. A signal perceived as credible is trusted to indicate that the product meets certain environmental or ethical standards, which in turn improves consumers' evaluation of product quality (Boulding & Kirmani, 1993; Kirmani & Rao, 2000). Therefore, this study will examine perceived eco-label credibility as a possible mediator in the relationship between eco-labels and perceived quality.

Overall, research on the impact of certified and non-certified ecolabels on consumers' perceived quality, when mediated by perceived eco-label credibility, provides valuable insights for managers and researchers in marketing, contributing to broader discussions on sustainability in the fashion industry. Additional validation of both practical and academic interest is described in Sections 1.3 (Academic relevance) and 1.4 (Practical relevance).

1.2 Research question

Based on the problem background, the research question for this study was formulated. The research question reads as follows:

How do eco-labels on clothing influence consumers' perceived product quality, and to what extent does perceived eco-label credibility mediate the relationship between certified and non-certified eco-labels and consumers' perceived product quality in the fashion industry?

1.3 Academic relevance

In the fashion industry, there is a notable lack of academic literature comparing the impact of Type I (certified) and Type II (non-certified) eco-labels, especially regarding consumer perceptions of product quality. This topic is particularly relevant as eco-labels increasingly influence consumer behavior and shape the sustainable fashion market. Unlike previous studies that primarily focus on the presence or absence of eco-labels, this research seeks to delve deeper into the theoretical distinctions between Type I and Type II eco-labels. By examining these distinctions, the study explores how consumers' responses to these labels may vary based on their perceived credibility. This approach addresses the different ways eco-labels can affect consumer decision-making and product evaluations.

Furthermore, this research extends the principles of signaling theory by exploring how different types of eco-labels convey information about product sustainability and quality, and how this information is processed by consumers. By introducing the concept of perceived eco-label credibility as a potential mediator, this study offers a novel perspective that differentiates it from existing literature. The findings can provide valuable insights into the effectiveness of eco-labels in guiding consumer choices, thereby contributing to a more sustainable and responsible fashion industry.

1.4 Practical relevance

Currently, the European Parliament has proposed to mandate sustainability and circularity disclosures on textile labels, planned for the fourth quarter 2024 (European Parliament, 2024). Meaning that consumers are likely to encounter (certified) eco-labels more frequently while shopping in the end of 2024. As a result, this thesis can offer valuable insights for consumers aiming to make informed purchasing decisions. Understanding the distinction between

different types of eco-labels can help guide consumers towards more sustainable and credible products.

In the context of fashion business-to-consumer interactions, by understanding consumers' perceptions, clothing brands can customize their actions or strategies to align with how consumers relate eco-labels to product quality (Thørgsen, 2000). Thereby, they can enhance their ability to meet consumer needs and improve overall satisfaction with their sustainable offerings; potentially increasing sales and customer loyalty (Chen & Chang, 2013; McClusky & Loureiro, 2003; Das, 2015). As sustainable clothing companies adopt eco-labels and differentiate their products based on sustainability, they not only stand out from competitors, but they can also set an example for other clothing brands to follow suit and adopt similar strategies (D'Souza et al., 2006). Additionally, in the business-to-business context, insights on the perceived credibility of the certified eco-label tested in this study might encourage retailers and buyers to prioritize sourcing from suppliers with this label. This prioritization can enhance the overall sustainability of the supply chain and appeal to environmentally conscious consumers. Consequently, as more companies adopt certified eco-labels, the environmental impact of clothing production on the climate decreases.

Finally, this study can provide valuable insights for policymakers responsible for implementing and regulating eco-label standards. They can use these insights to advocate for stricter certification regulations, combating potential greenwashing practices and strengthening consumer confidence in eco-labels where necessary (Teisl, 2003).

In summary, this study contributes to the field of digital marketing by exploring the role of Type I (certified) and Type II (non-certified) labels, in promoting sustainable and responsible fashion products. Ultimately, the research serves as a significant foundation for understanding the connections between fashion industry, society and sustainability.

1.5 Thesis structure

In the Introduction section, the problem background, research questions and academic and practical relevance are discussed. Chapter Two describes the theoretical framework, followed by the research methodology in Chapter Three. The results are presented in Chapter Four. The interpretation of the results, theoretical and practical implications, research limitations, recommendations for future research, and conclusions are established in Chapter Five. Finally, the Master Thesis is concluded by references and appendices.

2. THEORETICAL FRAMEWORK

This section will provide a comprehensive foundation for all aspects of this study. First, the theoretical framework of 'Signaling Theory,' which underpins this thesis, will be substantiated. Second, the concept of sustainability in fashion will be explored. Third, the role of eco-labels and an overview of the various types of eco-labels will be examined, with particular attention to the distinction between certified and non-certified eco-labels. Fourth, the dependent variable, perceived quality, will be discussed, followed by an analysis of the relationship between the independent variable (type of eco-label) and the dependent variable (perceived quality). Finally, the mediator, perceived credibility of the eco-label, and its expected influence on the relationship between eco-labels and perceived quality will be explained.

2.1 Signaling Theory

Signaling theory provides a robust framework in this study to explore the impact of eco-label type (certified versus non-certified) on perceived product quality, with the potential mediation of perceived eco-label credibility. Signaling theory examines how one party communicates information to another party through visible, audible, or other detectable signals or cues (Alhabeeb, 2007). The two parties involved in the signaling process are the signaler (the brand or producer), who communicates the information, and the receiver (the consumer), who seeks the information, plus the signal itself (label) (Connelly et al., 2011).

In marketing literature, signaling theory helps explain consumer behavior in situations of information asymmetry (Connelly et al., 2011; Javeed et al., 2022). Information asymmetry arises when *"the actual quality of a product is not readily observable due to its complex and experiential nature, or when companies do not share all product-related information with their consumers"* (Akdeniz et al., 2013, p. 730). So, information asymmetry exists when one

party has access to product information that is unavailable to the other. This information gap frequently emerges in the context of sustainable consumption, particularly within the fashion industry (Morris et al., 2020). Here, the limited information supplied by brands or producers complicates the task for consumers seeking to identify genuinely sustainable products. Consequently, consumers often rely on signals like labels or certifications to help make informed purchasing decisions (Schumacher, 2010; Nikolaou & Kazantzidis, 2016). The foundational role of signaling theory in the relationships examined within this study will be further elaborated upon in Sections 2.4 (Perceived Quality) and 2.5 (Perceived Eco-Label Credibility).

2.2 Sustainable consumption in fashion

For years now, ecological and social issues have had a profound impact on the textile and clothing market (Koszewska, 2011). The reality of the current fashion industry is illustrated by impactful factors, such as its massive water consumption (79 trillion liters annually), substantial CO2 emissions (4 to 5 billion tons per year), the staggering volume of textile waste (> 92 million tons per year), and the labor exploitation and underpayment of its workers (Liu et al., 2017; Niinimäki et al., 2020). Fortunately, a growing number of fashion companies and consumers are well aware of these issues and are actively striving towards sustainable products and consumption practices (Cheah & Huang, 2021; Feuβ et al., 2022). Yet environmental and social impacts are not the only drivers for fashion companies. Public backlash against big brands has increased the industry's sensitivity to corporate social responsibility (Caniato et al., 2012; NOS, 2024). Moreover, research shows that as consumers become more aware of their eco-friendly and ethical purchasing habits, they are increasingly willing to pay a premium price for sustainable products (Pícha & Navrátil, 2019). Accordingly, this shift drives companies toward adopting more sustainable production

methods (Solomon, 2013; Yokessa & Marette, 2019). However, despite consumers' frequent desire to adopt more sustainable practices, their attitudes often fail to align with their behavior (Ceylan, 2019). Thereby, Ceylan (2019) argues that sustainable consumer behavior is positively influenced by both a favorable attitude towards sustainable practices and a comprehensive understanding of the fashion industry's impact. To assist knowing and unknowing consumers towards sustainable purchasing decisions, fashion producers can effectively communicate their sustainable practices by utilizing eco-labels (Testa et al., 2013).

2.3 The role of eco-labels

Eco-labels or 'green advertising' fulfill various roles in green marketing. Generally, companies can utilize ecolabeling to **inform** consumers about their environmentally friendly products, **motivate** consumers to purchase eco-friendly products, and **differentiate** themselves from competitors (Testa et al., 2013; Henninger, 2015; Yilmaz et al., 2019; Kabaja et al., 2022; Kolović et al., 2023). In addition, Schumacher (2010) states that the three main goals of eco-labels involve: 1) product differentiation, 2) reliable labeling, and 3) reducing informational asymmetries. This thesis defines eco-labels as signaling tools that inform consumers about the product's features (Atkinson & Rosenthal, 2014; Bougherara & Combris, 2009).

2.3.1 Certified and non-certified eco-labels

There exist three types of eco-labels, as defined by the International Standards Organization (ISO): Type I (ISO 14024) represents third-party certified systems with a recognizable logo, Type II (ISO 14021) includes self-declared environmental claims, and Type III (ISO 14025) includes environmental statements based on life-cycle analyses (Horne, 2009). This research

emphasizes Type I (certified) and Type II (non-certified) eco-labels, as they appear to have increasing influence on consumer behavior in the fashion industry (Yau, 2012; Atkinson & Rosenthal, 2014; Wojnaroska et al., 2021; Ranasighne & Jayasooriya, 2021; Feuβ et al., 2022). An overview of ISO eco-labels can be seen in Table 2.1.

Table 2.1 Overview of the types of ISO eco-labels.

Type	**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 ecologically within 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, large volume of data)

Note. Adapted from "Social and eco-labelling of textile and clothing goods as a means of communication and product differentiation", by M. Koszewska, 2011, p. 22.

Certified or type I labels, verified by third-parties or public authorities, hold particular significance in the fashion industry (Hyllegard et al., 2012; European Commission, 2023). Feuβ et al. (2022) emphasize that the number of certified eco-products in textile is constantly increasing. The primary function of certified eco-labels is to act as credible and recognizable symbols, assisting consumers in identifying "licensed" eco-friendly and responsible products (Lanero et al., 2021). Moreover, third-party eco-certification offers several advantages for both producers and consumers. Firstly, certification standardizes best practices, reducing search costs for both producers and consumers. Secondly, third party involvement assures consumers of genuine implementation, which reduces the risk of greenwashing by producers who falsely claim to adopt sustainable practices. Thirdly, certifications often come with labels that effectively communicate the certification status to consumers (Schumacher, 2010). Certified eco-labels for textiles, especially emphasizing environmental well-being, include Oeko-Tex Standards 100, Global Organic Textile Standard (GOTS), Fair Wair Foundation, and FairTrade (Morris et al., 2020; European Commission, 2023; Neutral®, 2023). An outline of these labels can be found in Appendix A.

Non-certified or Type II labels, are eco-labels that can be created by a company without official verification (Crespi & Marette, 2005). Meaning that they are typically self-declared by manufacturers or producers, signaling their commitment to certain environmental or ethical practices. Atkinson and Rosenthal (2014) argue that the absence of third-party certification raises concerns about the reliability and credibility of non-certified eco-labels. Despite this challenge, non-certified eco-labels play an important role in promoting sustainability awareness among consumers (De Boer, 2003; Kolović et al., 2023).

Interestingly, numerous prior studies highlight the significant impact of (certified) eco-labels as powerful tools for promoting green products and influencing consumer purchase behavior (Aertsens et al., 2011; Smith and Paladino, 2010; Yau, 2012; Wojnaroska et al., 2021; Feuβ et

al., 2022). However, there remains a gap in understanding the implementation and differences in effects of certified eco-labels and non-certified eco-labels within the fashion industry. This is particularly concerning the perceived eco-label credibility, and how this influences the perceived quality consumers' link to eco-labelled products. To address this research gap, this study aims to examine the impact of Type I and II eco-labels on consumer behavior, mediated by the perceived eco-label credibility. Thereby, the study focuses on one key dependent variable; the perceived quality.

2.4 Perceived quality

Numerous studies have provided definitions for the construct of perceived quality. According to Tsiotsou (2006), perceived quality can be defined as *"the consumer's judgement about a product's overall excellence or superiority"* (p. 210). Kim (2007) similarly describes perceived quality as a consumer's overall evaluation of a product, similar to an attitude. Additionally, Mitra and Golder (2006) emphasize the connection between perceived quality and expectations, suggesting that perceived quality is the overall subjective judgment of quality relative to expected quality.

Perceived quality differs from objective quality (Monroe & Krishman, 1985; Tsiotsou, 2006; Chi et al., 2009; Aakko & Niinimäki, 2021). The objective quality refers to the actual technical excellence of the product based on *measurable and verifiable* factors. Conversely, perceived quality includes the subjective feelings of this technical excellence of the product based on *anticipated* factors. Building on this distinction, Chi et al. (2009) define perceived quality as the consumer's subjective feelings about the product's objective quality. Likewise, researchers such as Garvin (1984), Nelson (1970), and Akdeniz et al. (2013), highlight that perceived quality functions as a dimension of objective quality utilized by consumers in a

situation of information asymmetry, where objective quality is not easily observable due to information gaps.

According to these definitions, perceived quality in this study is defined as a dimension of quality that captures the consumer's subjective judgment about the objective quality of a clothing product, shaped by the information asymmetry inherent in the fashion industry.

2.4.1 The various contexts of perceived quality

Perceived quality has been studied in a variety of contexts across different fields, reflecting its importance in understanding consumer behavior, product development and marketing strategies (Lee & Tai, 2008; Lieb et al., 2008; Steenkamp, 1990).

In general, the perceived quality of products has a significant impact on consumer decision making, particularly in shaping consumer attitudes, satisfaction levels, and subsequent intentions to repurchase (Choi & Kim, 2013; Akkoo & Niinimäki, 2021). Moreover, previous research indicates that perceived quality positively influences buying behavior when consumers perceive a product as high quality (e.g., Das, 2015; Zhao et al., 2022; Wasaya et al., 2023). Indeed, as McClusky and Loureiro (2003) found, consumers are willing to pay more for environmentally friendly food products depending on their perceived high quality. Furthermore, studies in product development indicate that understanding how consumers perceive quality is crucial for developing products that meet or exceed their expectations (Falk, 2009; Lieb et al., 2008). This understanding in turn informs research into marketing strategies, allowing companies to create targeted campaigns, optimize product positioning and effectively communicate the value and benefits of their products to target audiences (Steenkamp, 1990; Vantamay, 2008).

2.4.2 Evaluative quality cues

In essence, this study focuses on how consumers perceive the quality of clothing products. Forsythe et al. (1996) suggest that consumers rely on evaluative cues or signals to judge the quality of clothing. These evaluative cues can be characterized as either intrinsic and extrinsic quality cues (Steenkamp, 1990; Aakko & Niinimäki, 2021).

Intrinsic cues refer to the physical attributes of the product's composition that cannot be changed or manipulated without changing the product itself (e.g., function, durability, material composition, color, fabric texture) (Szybillo & Jacoby, 1974; Forsythe et al., 1996). Extrinsic cues, on the other hand, involve the external aspects that are related to the product. Meaning that they are product-related, but are not physically integrated into it (e.g., brand, country of origin, packaging, price, marketing) (Olson & Jacoby, 1972). Hence, consumers tend to form impressions of quality, by evaluating extrinsic cues as well as intrinsic cues (Feuβ et al., 2022).

In the context of this study, eco-labels – which convey information about a product's environmental attributes and sustainability practices –are categorized as extrinsic quality cues since they provide information external to the physical product itself (Aakko & Niinimäki, 2021). Nevertheless, given the online nature of this study, consumers cannot physically assess the product's intrinsic quality cues, and can only rely on the extrinsic quality cue, the eco-label, provided by them. Signaling theory suggests that when consumers cannot obtain complete product information, extrinsic cues act as signals of the quality of unobservable intrinsic product features (Alhabeeb, 2007; Brach et al., 2017). Supporting this notion, Javeed et al. (2022) state that *"the extrinsic cues are taken as indicators of quality for the enclosed product"* (p. 5), indicating that consumers depend on these external signals to assess the product's quality. Therefore, in this study eco-labels act as signals of quality.

2.4.3 Eco-labels as signals of quality

To date, specific studies directly linking eco-labels to perceived quality in fashion are limited. Nevertheless, the broader literature suggest a meaningful relationship between the two variables exploring how eco-labels influence consumer perceptions, including perceived quality. For instance, Ziyeh and Cinelli (2023) indicate that eco-labels help communicate the environmental benefits of fashion products, which can enhance the perceived quality in the eyes of consumers. Research by Jin et al. (2017) suggest that the presence of eco-labels can improve the perceived quality of clothing items by clearly conveying their eco-friendly features. They further state that when consumers find eco-labels useful and easy to understand, this will positively impact their perceptions and purchasing decision regarding sustainable clothes. Additionally, the relationship between eco-labels and perceived quality is supported by findings that show consumers are willing to pay a premium for clothing products with eco-labels, as these labels signal higher quality and environmental responsibility (Nam et al., 2017). This willingness to pay more further underscores the positive impact of eco-labels on perceived quality, as they signal to consumers that products meet environmental standards; instilling confidence and fostering a sense of responsibility towards sustainable choices (Cho, 2017; Sirieix et al., 2013). Moreover, the general importance of labeling is emphasized in a study by Parkinson (1975), which shows that consumers rate products with seals and labels more favorably than those without.

Based on previous assumptions, it can be suggested that the presence of an eco-label positively influences the perceived quality of clothing products. Eco-labels enhance consumer perceptions of product quality by signaling sustainability and environmentally responsibility, aligning with signaling theory's proposition that eco-labels act as signals influencing consumer perceptions of product quality. Thus, based on these insights, the first hypothesis posits:

H_1: The presence of an eco-label positively affects consumers' perceived quality of a clothing product compared to a clothing product without an eco-label.

2.5 Perceived eco-label credibility

This section discusses the mediator "perceived eco-label credibility" and explains how it clarifies the relationship between the type of eco-label (certified versus non-certified) and the perceived quality. The perceived credibility of eco-labels stems from the broader concept of credibility, which relates to how truthful or reliable individuals find a piece of information or its source (Eisend, 2002; Moussa & Touzani, 2008). Generally, the term credibility can be defined as the quality that enables someone or something to be trusted or believed by others (Oxford English Dictionary, 2024).

In economics, credibility is defined as the extent to which a certain product or service is seen as credible in terms of expertise and trustworthiness (Erdem & Swait, 2004). 'Expertise' encompasses the perceived knowledge, experience, skill and competence of the source. 'Trustworthiness' relates to the consumers' belief that the source delivers information honestly, without any intent to manipulate or deceive. Furthermore, these definitions explain that credibility is not inherent in a service or product itself, but is a subjective perception of consumers (Moussa & Touzani, 2008). Hence, in examining the credibility of eco-labels within the fashion industry, this thesis consistently relates to the perceived credibility of these labels by consumers.

2.5.1 Eco-labels and perceived eco-label credibility

According to signaling theory, the effectiveness of a signal in conveying information depends on the perceived credibility of that signal (Moussa & Touzani, 2008). For eco-labels to be effective, they must be perceived as credible (Atkinson and Rosenthal, 2014). For instance, Brach et al. (2017) found that eco-labels lead to increased purchase intentions only when customers perceive them as credible. Furthermore, previous studies highlight that the credibility of certifiers appears to be a crucial factor for the effectiveness of eco-labels (Lanceneux, 2001; Carmona, 2011). In line with this, two separate investigations by Pancer et al. (2017) and Roe and Sheldon (2017) determined that the most efficient method to enhance the perceived credibility of green claims is by utilizing third-party certifications. Thereby, Moussa and Touzani (2008) emphasize that *"to be credible, a label must come from a third-party organization, foreign to the manufacturer/seller, competent and not at all interested in the sale of the product bearing the label"* (p. 528). Additionally, De Chiara (2015) highlights that claims from a third-party organization or public authority are likely to be perceived as more credible than those from a business source. Indeed, previous findings across various industries indicate that consumers perceive certified eco-labels that are verified by third-party certifications to be more credible than other eco-labels (Albersmeier et al., 2010; Brach et al., 2017). For instance, research conducted within the food industry by Albersmeier et al. (2010) reported that customers perceive third-party certifications as more credible and trustworthy than company-owned labels, also known as self-declared labels. This is supported by Brach et al. (2017), who discovered that, overall, certified labels tend to inspire greater trust among consumers compared to labels without certification. Moreover, other studies reveal that consumers are more likely to perceive non-certified eco-labels as attempts at greenwashing (Sirieix et al., 2013; Delmas & Gergaud, 2021), wherein companies falsely advertise products as eco-friendly while their actual practices harm the environment (Sharma & Kushwaha,

2019). Suspicion of greenwashing is closely linked to a lack of perceived credibility in the eco-label (Atkinson and Rosenthal, 2014).

With regard to the fashion industry, research on how consumers perceive the credibility of different types of eco-labels, particularly certified versus non-certified eco-labels, is still very limited. Based on previous assumptions and findings, it can be expected that a certified eco-label will be perceived as more credible than a non-certified eco-label in fashion. Therefore, the second hypothesis reads as follows:

H_2: A certified eco-label is perceived as more credible by consumers than a non-certified eco-label in the fashion industry.

2.5.2 Perceived eco-label credibility and perceived quality

In exploring the relationship between perceived eco-label credibility and perceived quality, several studies provide compelling evidence. Supported by signaling theory, Boulding & Kirmani (1993) and Kirmani & Rao (2000) found a significant relationship between the credibility of signals and consumers' perception of product quality. Specifically, their research indicates that when consumers perceive a signal as credible, they are more likely to associate the product with higher quality. Moussa & Touzani (2008) further emphasize this point, noting that credible labels play a critical role in reducing uncertainty about a product's quality. Their findings suggest that when consumers trust an eco-label, it mitigates their concerns about the unobservable attributes of the product, such as its environmental impact or ethical production processes. This reduction in uncertainty enhances the overall perception of product quality (Aakkoo & Niinimäki, 2021).

Thus, an eco-label that is perceived as credible not only enhances consumers' confidence but also positively influences their perception of product quality (Moussa & Touzani, 2008). This is further supported by a wide range studies, which note conversely that a signal lacking credibility from the consumers' perspective may fail to reduce uncertainty about the product's unobservable qualities, resulting in a less favorable perception of the product (Balasubramanian & Cole, 2002; Thøgersen, 2002; Erdem and Swait, 2004; Brach et al., 2017; Szabo & Webster, 2020). Collectively, these studies highlight the importance of eco-label credibility in influencing consumer perceptions and underscore the necessity for eco-labels to be perceived as trustworthy and reliable.

In conclusion, the relationship between perceived eco-label credibility and perceived product quality is well supported by numerous studies. The credibility of eco-labels can play a critical role in shaping consumer perceptions; when consumers perceive an eco-label to be credible, it not only enhances their confidence but also positively influences their perception of product quality. Thus, it can be assumed that the perceived credibility of an eco-label affects the perceived quality of a clothing product. Therefore, the following hypothesis is:

H_3: The perceived credibility of an eco-label positively influences consumers' perceived quality of a clothing product.

2.5.3 The mediating effect of perceived eco-label credibility

Finally, the mediating role of the perceived credibility of the eco-label between the type of eco-label (certified versus non-certified) and perceived quality will be examined. Based on the preceding hypotheses and signaling theory, it can be concluded that the type of eco-label (certified versus non-certified) affects perceived quality indirectly through the perceived

credibility of the eco-label. More specifically, certified eco-labels increase perceived credibility, which in turn increases perceived product quality. Conversely, uncertified eco-labels may lower perceived credibility, which in turn lowers perceived product quality. Thus, the type of eco-label (certified and non-certified) is expected to affect perceived product quality primarily through its influence on the perceived credibility of the eco-label. Therefore, the fourth hypotheses are:

H_{4a}: The perceived credibility of an eco-label positively mediates the relationship between a certified eco-label and the perceived quality of the clothing product.

H_{4b}: The perceived credibility of an eco-label negatively mediates the relationship between a non-certified eco-label and the perceived quality of the clothing product.

Figure 2.1 Conceptual model comparing products with a certified eco-label, a non-certified eco-label, and no eco-label.

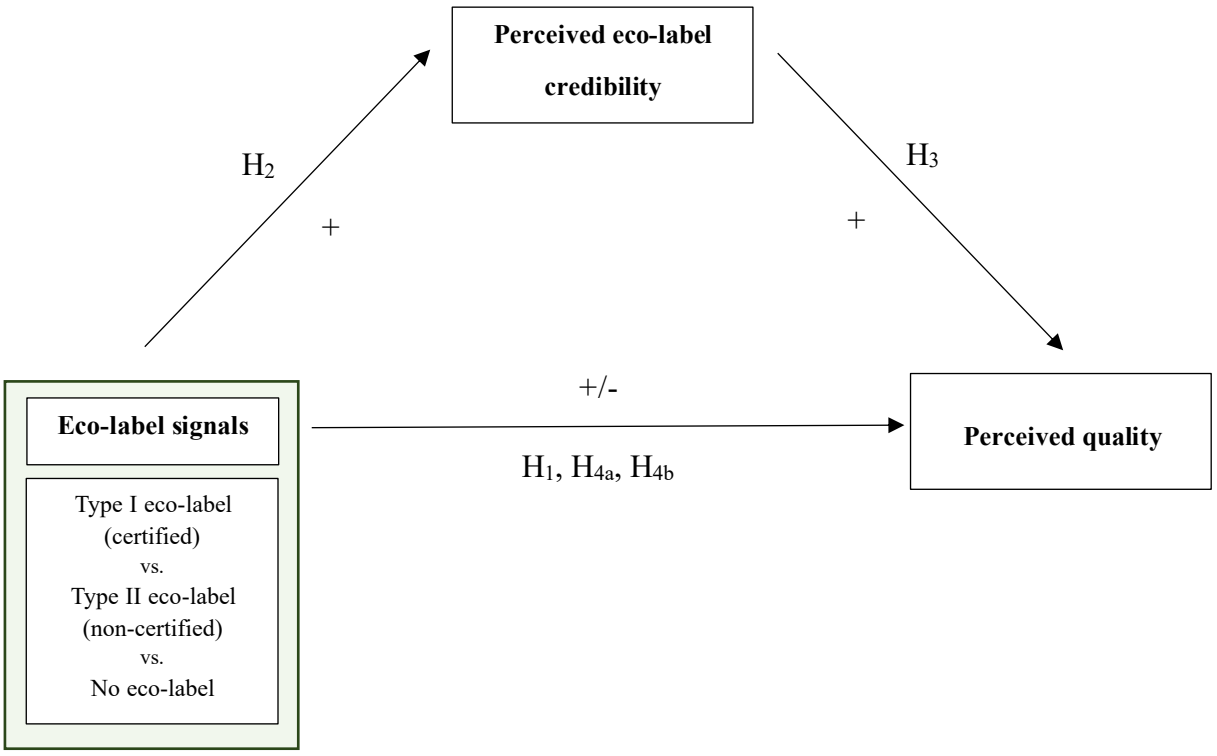


Table 2.2 Hypotheses.

Hypothesizes
H_1: The presence of an eco-label positively affects consumers' perceived quality of a clothing product compared to a clothing product without an eco-label.
H_2: A certified eco-label is perceived as more credible by consumers than a non-certified eco-label in the fashion industry.
H_3: The perceived credibility of an eco-label positively influences consumers' perceived quality of a clothing product.
H_{4a}: The perceived credibility of an eco-label positively mediates the relationship between a certified eco-label and the perceived quality of the clothing product.
H_{4b}: The perceived credibility of an eco-label negatively mediates the relationship between a non-certified eco-label and the perceived quality of the clothing product.

3. METHOD

This section outlines the research methodologies employed in this study. First, the chosen methodologies are described in detail, followed by an explanation of the stimulus design. Next, the study sample is discussed, and both the pre-test and main study phases are elaborated on. The procedure is then outlined, followed by a review of data inspection and participant demographics. Finally, the variable measurements of the study and the utilized statistical methods are explained.

3.1 Selection of methodologies

3.1.1 Quantitative design

A quantitative methodology was selected for this study to determine the impact of different types of eco-labels (certified versus non-certified) on consumers' perceived product quality, with a focus on the mediating role of perceived eco-label credibility. The decision to use a quantitative method rather than a qualitative approach was based on the nature of the research objectives and the need for numerical data. Quantitative research allows for the collection and analysis of measurable data, allowing researchers to explain the relationships between the variables under investigation, such as eco-label types, perceived quality, and eco-label credibility (Muijs, 2011).

In contrast, qualitative methods collect non-numerical data like text, narrative or images to explore more subjective matters in consumer behavior, which would not be appropriate for the purpose of the current study to examine measurable relationships (Namey & Trotter, 2015). Moreover, quantitative research is ideal for answering predictive questions and analysing the strength of relationships, which aligns with this study's focus on predicting how eco-labels influence consumer perceptions of product quality and how eco-label credibility mediates this

relationship (Tewksbury, 2009). Finally, predictive questions, such as those in this study, are best addressed through quantitative research methods, further supporting the suitability of this approach (Muijs, 2011; Zelner et al., 2021).

3.1.2 Experimental design

To test the hypotheses in this study, a 3 (type of eco-label: certified, non-certified, control condition) × 2 (product type: T-shirt, Blazer) experimental between-subjects design is used. The study includes two independent variables. The first independent variable is the type of eco-label with three levels: certified eco-label, non-certified eco-label, and no eco-label (control). The second independent variable is the clothing product with two levels: casual (T-shirt) and formal (Blazer). The choice of the clothing products will be explained in Section 3.5.3 (Clothing products).

This design results in six experimental conditions, combining the three eco-label types with the two product types. Table 3.1 shows the research design. Participants are randomly assigned to one of the three experimental groups based on the eco-label type. Each group is presented with both clothing products (T-shirt and Blazer), making it a between-subjects design for the eco-label type and within-subjects for the product type.

- Group 1 is exposed to clothing products with a certified eco-label.
- Group 2 is exposed to clothing products with a non-certified eco-label.
- Group 3 serves as the control group, exposed to clothing products without an eco-label.

The differences between these three experimental groups will determine the effect of eco-labels on eco-label credibility and subsequently perceived quality.

Table 3.1 Research design: treatments.

		Type of eco-label		
		Certified eco-label	Non-certified eco-label	No eco-label (control group)
Product	T-shirt Blazer	1	2	3

3.2 Simulus design

Based on the experimental design, the stimulus design was developed. The stimulus design includes a two-step scenario in which participants are presented with the two clothing products attached with either a certified or non-certified eco-label or the control label.

Prior to evaluating the label stimuli, participants are instructed to read a short statement. This statement indicates that they are shopping for a new white T-shirt from a brand for both men and women. Furthermore, no information about sustainable practices is to participants, so that consumers must rely upon their own knowledge to interpret the information available on the label (Hyllegard et al., 2012). Subsequently, in the questionnaire, following the T-shirt scenario, identical stimuli are employed for the Blazer scenario. An example of the stimuli material for the T-shirt and Blazer product, and a certified eco-label ('Fair Trade Certified™ Cotton' label) is illustrated in Figure 3.1 and 3.2. The rest of the stimuli materials can be found in Appendix C.

Figure 3.1 Example stimuli material for the T-shirt with certified eco-label treatment.

Imagine that you are browsing through an online clothing store in search of a new white t-shirt. You come across a design that catches your eye—it's a white t-shirt by a brand for both men and women. Intrigued, you decide to take a closer look.

As you hover over the product image, you notice a small label attached to the t-shirt.

Figure 3.2 Example stimuli material for the Blazer with certified eco-label treatment.

Imagine that you are browsing through an online clothing store in search of a new black blazer. You come across a design that catches your eye—it's a black blazer by a brand for both men and women. Intrigued, you decide to take a closer look.

As you hover over the product image, you notice a small label attached to the blazer.

3.3 Sampling

A sample can be defined as *"a group of relatively smaller number of people selected from a population for investigation"* (Alvin, 2016, p. 11), allowing researchers to generalize findings to a larger population (Gideon, 2012). The size of the sample is determined by the number of participants that is needed for each treatment group. Following Christensen's (2007) recommendations regarding subject size for each treatment, it is advised to have between 30 and 50 participants for each treatment group. For this study, involving three treatments, this indicates that the sample size should range from a minimum of 90 to a maximum of 150 subjects. Thus, the desired sample size consists of at least $N = 90$ subjects.

To collect participants, the convenience sampling method is used. Convenience sampling is a non-probability sampling technique that involves recruiting participants who are easily accessible (Bryman, 2008). According to Alvin (2016), this approach is advantageous when the target population is broadly categorized, as is the case for this research. The sampling strategy involves distributing the questionnaire through social media platforms (e.g., Instagram, LinkedIn) and the researcher's personal networks. This strategy requires fewer resources, is cost-effective, and saves time because the sample can be accessed quickly and easily. However, one drawback is the potential for sampling bias, as the sample may not be representative of the target population (Alvin, 2016).

3.4 Pre-test

Prior to developing the main study, a pre-test was carried out. The purpose of the pre-test was to determine which certified and non-certified eco-labels are most familiar to participants and to assess their overall familiarity with eco-labels in the fashion industry. The pre-test was composed in the online software program Qualtrics and distributed through the researcher's personal networks, including WhatsApp groups and individual messages. A total of 45 participants (N=45) completed the pre-test.

In the pre-test, the participants were first briefly introduced by stating what they could expect in the pre-test. Secondly, they were asked to fill in their demographics (i.e. age, gender and highest achieved educational level), their shopping engagement, and their preferred shopping method. Thirdly, they were first presented with four certified eco-labels; GOTS (Global Organic Textile Standard), Fair Trade Certified™ Cotton, OEKO-TEX®, and EU Ecolabel. All four labels emphasize environmentally friendly production processes; claiming that the products adhere to high environmental standards across the entire supply chain. This commonality ensures that the labels are comparable. Furthermore, the eco-labels are used in

Europe and hold certification from either a European third-party entity or a government agency (Feuβ et al., 2022; Lou et al., 2022; European Commission, 2023; Neutral®, 2023). Fourthly, the participants were presented with four non-certified eco-labels, which were chosen based on the relevant "green apparel claims" for this research (Sinha & Shah, 2010; Byrd & Su, 2020). For each eco-label, participants were asked to indicate their familiarity with each eco-label by rating it on a 7-point Likert scale, where 1 = "not at all familiar" and 7 = "very familiar" (Tam, 2008). Finally, they were asked to rate their overall familiarity with eco-labels in general, using the same 7-point Likert scale.

3.4.1 Pre-test results

The results from the pre-test show that 56% of the participants shop for clothing items 1-3 times per month, with both online and offline shopping (in physical stores) being the preferred methods. A paired t-test revealed a significant difference in familiarity in ratings between certified and non-certified eco-labels among the respondents ($t(44) = 2.80$, $p < 0.01$, 95% CI [0.16, 0.96]). So, respondents demonstrated higher familiarity with certified eco-labels (mean difference = 0.56) compared to non-certified eco-labels.

To determine if there were significant differences in familiarity scores among the certified eco-labels and the non-certified eco-labels, a repeated measures ANOVA was conducted. The results revealed a statistically significant difference in familiarity scores across both the four certified eco-labels ($F(3, 132) = 55.59$, $p < 0.01$) and the four non-certified eco-labels ($F(3, 132) = 3.78$, $p = 0.01$). Follow-up pairwise comparisons indicated that, among the certified eco-labels, the 'Fair Trade Certified™ Cotton' label ($M = 5.49$, $SD = 1.69$) was significantly more familiar to participants than other certified eco-labels ($p < 0.01$). For the non-certified eco-labels, this appeared to be the 'Eco label' ($M = 3.04$, $SD = 1.83$), particularly compared to the 'Organic label' ($p < 0.05$). Consequently, these two eco-labels

were chosen for use in the main study, as detailed in Section 3.5 (Main study). Furthermore, the results from the final question indicated that the majority of the participants were generally not really familiar with eco-labels in fashion (M = 3.18, SD = 1.56). The lay-out and an overview of the results of the pre-test can be found in Appendix D.

3.5 Main study

In this paragraph the main study will be explained. First, the eco-labels will be discussed, followed by a more detailed explanation of the choice of clothing products. Lastly, the procedure of the online questionnaire is explained.

3.5.1 Fairtrade Cotton

Based on the results of the pre-test, the Fairtrade Cotton label will be tested for the certified eco-label treatment. Fairtrade (Cotton) is a global movement that focuses on empowering cotton farmers through cooperative organizations and providing them with sustainable development opportunities; supporting both the ethical and sustainable practices regarding the global cotton industry. Fairtrade Cotton promotes sustainable practices, reducing chemical dependency, and fostering resilience to climate change. Furthermore, Fairtrade Cotton standards prioritize farmers' health and safety, prohibit genetically modified seeds, and encourage organic certification. By choosing Fairtrade Cotton products, consumers indirectly empower small-scale farmers and promote positive change in the fashion and textile industry (Fairtrade Cotton, 2024). Since the pre-test results indicate that participants recognize the Fairtrade label the most, this is consistent with the label's status as one of the most recognized certification labels worldwide (GlobeScan, 2023). Furthermore, the pre-test results indicate

that the Fairtrade Cotton label effectively serves its main purpose as a certified label, functioning as a credible and recognized symbol ($M_{familiarity}$ = 5.49) that helps consumers identify eco-friendly and responsible products (Lanero et al., 2021). The 'Fair Trade Certified™ Cotton' label is shown in Figure 3.3.

Figure 3.3 'Fair Trade Certified™ Cotton' label.

3.5.2 Non-certified 'Eco' label and control condition

Among the non-certified labels, the pre-test revealed that participants most commonly recognized the "Eco" label ($M_{familiarity}$ = 3.04). The non-certified label is shown in Figure 3.4. For the control condition, a fake label was developed, featuring an illustration of a figure wearing a blazer and t-shirt. This control label was chosen to serve as a baseline against which the effects of certified and non-certified eco-labels could be measured. Furthermore, the control label was designed to be visually similar to the eco-labels in terms of layout and design elements, but without any environmental claims. This approach ensures that any observed differences in participant responses can be attributed to the eco-label themselves (Mohr et al., 2009). The control label is presented in Figure 3.5.

Figure 3.4 'Eco' label.

Figure 3.5 Control label.

3.5.3 Clothing products

For this study, two clothing products (T-shirt and blazer) were selected. The selection of the products was guided by two criteria. The first criterion, applicable to all products, was that participants should be potential buyers of the items. The second criterion was that the products are suitable for purchase by both men and women, following Dodds et al. (2019). These criteria are met because both T-shirts and blazers are commonly sought garment items by a broad demographic. They can be categorized as unisex garment, making them wearable for all genders; broadening the range of potential participants and expanding the experiment's target audience (Reis et al., 2018). Moreover, T-shirts and blazers derive from two different product categories, casual (T-shirt) and formal (blazer), resulting in a comparative analysis of the study (Della Porta, 2008). This provides insights on how eco-labels influence consumer behavior across different product types.

3.5.4 Combined analysis of perceived quality across product types

To determine whether there is a significant difference in perceived quality between the two product types, a repeated measures ANOVA was conducted. First, two new variables were created by calculating the mean scores of the perceived quality for the T-shirt and Blazer product. The results of the tests of within-subjects contrasts show that there was no significant difference in perceived quality between the T-shirt and the blazer ($p = 0.47$). Additionally, no significant interaction effect was found between 'ProductType' and 'LabelType' ($p = 0.96$), indicating that the effect of label type on perceived quality does not differ between the T-shirt and the blazer. Based on these findings, the perceived quality ratings of both the T-shirt and the blazer are combined for further analysis, treating them as a single group. This decision was made to simplify the analysis and because there was no evidence to suggest that the relationship between label type and perceived quality differs across these product types. Consequently, the experimental design was changed to a 3 x 1 format for the remainder of the study. The results of the tests within-subjects contrasts can be found in Appendix E. Furthermore, Table 3.2 presents the descriptive statistics of perceived quality for T-shirts and Blazers, categorized by label type, to illustrate variations across different product and label combinations.

Table 3.2 Descriptive statistics of perceived quality for T-shirts and Blazers by label type.

Label type		Perceived quality T-shirt	Perceived quality Blazer
Certified eco-label	Mean	5.57	5.54
	Std. Deviation	.71	.90
Non-certified	Mean	5.08	5.02
	Std. Deviation	.87	.92
Control label	Mean	4.11	4.04
	Std. Deviation	1.17	1.10
Total	Mean	4.95	4.90
	Std. Deviation	1.09	1.14

3.5.5 Procedure

The online experiment was conducted using Qualtrics, an online software platform used for data collection through an online questionnaire. The questionnaire was distributed through the researcher's personal online networks, including WhatsApp groups, individual messages and the social media platform LinkedIn. In addition, the survey platform SurveyCircle was used to recruit participants outside the researcher's personal connections. The data collection period lasted from 8 July 2024 till 15 July 2024. Each participant spent less than 5 minutes completing the questionnaire.

The questionnaire started with an introduction outlining the purpose of the thesis and explaining what participants could expect. Following the introduction, participants were asked to indicate their familiarity with the term "sustainable fashion" (7-point Likert scale, 1 = strongly disagree, 7 = strongly agree) to gauge their baseline knowledge and awareness of the concept. They were then informed that they would be shown two clothing products and a clothing label.

Subsequently, the two labeled clothing products and an image of the label were presented in random order. Participants were exposed to the first stimulus; images of the clothing products (T-shirt and blazer) featuring a certified eco-label, non-certified eco-label or control label, depending on their assigned experimental group. Next, participant rated both products separately on the dimension of perceived quality. Additionally, an image of the featured label was presented separately. Here, participants rated the label on the dimension of perceived eco-label credibility. Lastly, participants were asked demographic questions about their age, gender, educational level, and nationality. Finally, the participants were asked which label was presented to them to check whether they correctly identified the label. The full questionnaire can be found in Appendix F.

3.6 Data inspection and participants demographics

A total of 120 participants completed the survey; however, four participants reported a nationality other than Dutch (2 German, 1 Indonesian, and 1 Argentinian), and were therefore excluded from the dataset. Following this, the dataset was checked for outliers, as they could significantly impact the results of the analysis. Outliers were identified using boxplots, where overall perceived quality was plotted against the three eco-label types, and the same method was applied for overall perceived credibility. This approach allowed for the detection of data points that fell outside the interquartile range (IQR), thus identifying potential outliers for removal to ensure the accuracy of the analysis. In total, five outliers were found and removed to improve the accuracy of the study (Osborne & Overbay, 2004). The outliers can be found in Appendix G. This resulted in a final dataset of 111 Dutch participants included in the analysis (N = 111). The average age of the participants is M = 33.35 (SD = 15.05), with a minimum age of 18 years old and a maximum age of 78 years old. Furthermore, 47 participants are male (42.3%), 62 participants are female (55.9%), 1 participant is non-binary/third gender (0.9%),

and 1 participant preferred not to say their gender (0.9%). Regarding the highest level of education achieved, 2 participants completed primary education (1.8%), 1 participant completed lower secondary education (0.9%), 30 participants completed upper secondary education (27%), 52 participants earned a Bachelor's degree (46.8%), 25 participants earned a Master's degree (22.5%), and 1 participant earned a PhD (0.9%). The distribution of participants across the three experimental groups was as follows: certified label (n = 38), non-certified label (n = 39), and control label (n = 34). Overall, the participants reported a high level of familiarity with the term "sustainable fashion" (M = 5.50, SD = 1.21). When divided into groups, 9% indicated they were not familiar with sustainable fashion, 2.7% were neutral, and 88.3% indicated they were familiar with it. This means that the majority of the participants believe they have a good understanding of sustainable fashion.

To examine whether there were significant differences between the three experimental groups, an Analysis of Variance (ANOVA) was conducted for age, and chi-squared tests were conducted for gender and education. The results indicated no significant differences for age ($F(1, 109) = 0.13$, $p = 0.72$), gender ($X^2(6, N = 111) = 5.48$, $p = 0.48$), and education ($X^2(10, N = 111) = 11.72$, $p = 0.31$), showing that the groups are comparable in terms of demographic variables. Table 3.3 illustrates the exact distribution of age, gender and education over the three experimental treatments.

Table 3.3 Distribution of gender, age, and education over the three experimental groups (N = 111).

Type of eco-label		Certified	Non-certified	Control	**Total**
Gender	Male	13	19	15	47
	Female	24	19	19	62
	Non-binary/third gender	1	0	0	1
	Prefer not to say	0	1	0	1
Age	Mean	30.66	39.79	28.97	33.35
	SD	13.51	16.44	12.71	15.05
Education	Primary education	0	0	2	2
	Lower secondary education	0	0	1	1
	Upper secondary education	9	9	12	30
	Bachelor degree	21	19	12	52
	Master degree	8	10	7	25
	PhD	0	1	0	1
	Total	38	39	34	111

3.7 Measurements of the variables

In order to develop measurements for the dependent variable and mediator, modified and drafted scale items from previous research were used.

3.7.1 The dependent variable: perceived quality

Perceived quality is the dependent variable in this study. This thesis aims to evaluate the impact of eco-labels as extrinsic cues on perceived quality. To achieve this, the study assesses perceived quality using three scale items adapted from Han and Kwon (2009); focusing on how extrinsic cues affect perceived quality. These items are derived from three indicators: workmanship, quality, and durability, which are used to measure overall perceived quality of products (Dodds et al., 1991). The items were formulated as follows: (1) The workmanship of this product is likely to be: (very bad to very good), (2) The quality of this product is likely to be: (very bad to very good), (3) The durability of this product is likely to be: (very bad to very good). All items were measure using a 7-point scale, ranging from 1 = very bad to 7 = very good. The items for perceived quality were found to be reliable (Cronbach's α: $\alpha_{certified}$ = .909, $\alpha_{non\text{-}certified}$ = 0.865, $\alpha_{control}$ = 0.908). Since the T-shirt and Blazer were treated as a single group, the three items for measuring the perceived quality of the two clothing products were combined. So, the overall perceived quality score was calculated by creating a new variable, which is the average of six items measuring the perceived quality for both the T-shirt and Blazer.

3.7.2 The mediator: perceived eco-label credibility

Perceived eco-label credibility is the mediator variable in this study. To measure perceived eco-label credibility, six scale items were adapted from Moussa and Touzani's (2008) scale designed to assess the credibility of quality labels. The items were presented as follows: (1) I can trust what this sign says, (2) This sign comes from a recognized organization or experts, (3) This sign is honest, (4) The organization that issued this sign has good intentions, (5) The organization conducted serious tests before issuing this sign, (6) I trust this sign. Furthermore, the items were measured using a 7-point Likert scale, ranging from 1 = strongly disagree to 7 = strongly agree. The items for the perceived eco-label credibility were found to be reliable (Cronbach's α: $\alpha_{certified} = .729$, $\alpha_{non\text{-}certified} = 0.919$, $\alpha_{control} = 0.891$). The perceived credibility score was calculated by creating a new variable and taking the average of the six items.

3.8 Selection of statistical methods

To test the hypotheses, the statistical methods ANOVA (Analysis of Variance) and mediation analysis using the PROCESS macro are employed.

3.8.1 ANOVA

To compare perceived quality and perceived eco-label credibility across three different label types (certified, non-certified, and no eco-label (control)), one-way ANOVA (Analysis of Variance) is utilized. ANOVA is a statistical method that compares a continuous dependent variable across two or more categorical independent groups (Kim, 2014). In this study, the independent variable, eco-label type, has three distinct categories (certified, non-certified, and control). Although the dependent variable (perceived quality) is not strictly continuous, it is appropriate to treat it as such for the purposes of this analysis (Harpe, 2015).

Furthermore, one-way ANOVA is a useful method for this study, as it allows for the comparison of group means in a one-way between-subjects design, where participants are assigned to one of three groups, each representing a different category of the independent variable (three different label conditions). This method helps determine whether the differences in perceived quality and credibility between the label groups are statistically significant (Keselman et al., 1998; Moore et al., 2017). In addition, by comparing the variability between the group means to the variability within groups, ANOVA can assess whether the observed differences are meaningful or simply due to random variation (Leik, 1997).

3.8.2 Mediation analysis

Mediation analysis is essential to test whether the influence of eco-label type (certified vs. non-certified) on perceived product quality is mediated by perceived eco-label credibility. Therefore, in this study, a simple mediator model (Model 4) is used, where the independent variable (type of eco-label) is expected to influence the mediator (perceived credibility of the eco-label), which in turn influences the dependent variable (perceived quality). This relationship is measured in terms of paths: *path a* measures the effect of the independent variable on the mediator and *path b* measures the effect of the mediator on the dependent variable. Together, these paths (a and b) represent the indirect effect of the independent variable on the dependent variable through the mediator. '*Path c*' represents the direct effect of the independent variable on the dependent variable taking into account the mediator (Hayes, 2013; Hayes & Preacher, 2014).

To conduct mediation analysis, the PROCESS macro for SPSS is used, which is a statistical method that helps determine whether the relationship between an independent variable and a dependent variable is influenced by a mediator variable. PROCESS is suitable for this study

because it applies bootstrapping, which allows more reliable estimates of indirect effects even when assumptions such as normality are violated (Hayes, 2013). Moreover, it provides a user-friendly interface within SPSS, making it easier to compare direct and indirect effects and to understand how the independent variable affects the dependent variable both directly and via the mediator (Hayes & Preacher, 2014).

4. RESULTS

This section outlines the data analysis conducted for the study. The first step involved evaluating the assumptions for ANOVA. Following this, the hypotheses were tested using various statistical methods: ANOVA, Post Hoc tests, Independent Samples t-test, and Mediation Analyses. The chapter concludes with the presentation of results obtained using the PROCESS macro for SPSS, employing the bootstrap test by Preacher and Hayes to assess mediation effects. The analyses were carried out using statistical software programs SPSS and RStudio.

4.1 Assumptions for ANOVA

Before analyzing the data results, the four assumptions for ANOVA were evaluated (Emerson, 2022). The first assumption is that the dependent measure is a continuous variable (interval/ratio). In this study, the dependent variable was assessed using a 7-point Likert scale, which is generally considered continuous for the purposes of ANOVA (Norman, 2010). The second assumption requires that the data in each group must be independent of the data in other groups, and that the data for each group should be collected through random sampling. This assumption was satisfied, as each respondent was exposed to only one of the three treatments at a single point in time. The remaining assumptions were evaluated using SPSS.

The third assumption of ANOVA is normality. This was assessed using the Kolmogorov-Smirnov test in combination with visual inspections of the residuals for TotalPerceivedQuality and TotalPerceivedCredibility. The residuals were analysed through graphical histograms and plots, as detailed in Appendix I. The graphical analyses suggest that the data approximate a normal distribution. The p-values of the Kolmogorov-Smirnov test for normality of the

dependent variable (perceived quality) and mediator (perceived eco-label credibility) are presented in Table 4.1 and 4.2. For the certified eco-label group, both perceived quality and credibility deviated significantly from normality ($p < .05$). However, ANOVA is robust to such violations (Schmider et al., 2010), so the analysis proceeded.

Table 4.1 P-values Kolmogorov-Smirnov test of normality for perceived credibility.

Label type	**Sig.**
Certified eco-label	.01
Non-certified eco-label	.11
Control label	.20*

*. This is a lower bound of the true significance.

Table 4.2 P-values Kolmogorov-Smirnov test of normality for perceived quality.

Label type	**Sig.**
Certified eco-label	<.001
Non-certified eco-label	.20*
Control label	.06

*. This is a lower bound of the true significance.

The fourth assumption, homogeneity of variances, was tested using Levene's test. For perceived quality, variances were equal across the groups ($F(2, 108)= 1.24$, $p = 0.29$). For perceived eco-label credibility, the test revealed significant variance heterogeneity ($F(2, 108) = 8.58$, $p <.001$). As a result, Welch's ANOVA, which is robust to unequal variances, was used

(Kim, 2014). It revealed significant differences in perceived credibility among the eco-label types ($F(2, 61) = 73.98$, $p < .001$). Post-hoc tests using Dunnett's T3 and Games-Howell procedures confirmed significant pairwise differences between all groups (Shingala & Rajyaguru, 2015). Detailed results are provided in Appendix J.

4.2 Hypotheses testing

To initially examine the data, one-way ANOVA analyses were conducted using perceived eco-label credibility and perceived quality as the dependent variables. The mean scores and standard deviations for each label category are presented in Table 4.3.

Table 4.3 Cell means[a] and standard deviations for perceived quality and perceived eco-label credibility.

Label type		**Perceived quality**	**Perceived credibility**
Certified eco-label	Mean	5.56	5.65
	Std. Deviation	0.76	0.51
Non-certified eco-label	Mean	5.01	4.27
	Std. Deviation	0.82	1.11
Control label	Mean	4.07	3.36
	Std. Deviation	1.02	1.11
Total	Mean	4.92	4.46
	Std. Deviation	1.05	1.33

[a] The means are based on a 7-point scale, where 1 indicates the lowest level and 7 indicates the highest level

4.2.1 One-way ANOVA results

Perceived quality. To test whether the presence of an eco-label positively affects consumers' perceived quality of a clothing product compared to a clothing product without an eco-label (H_1), one-way ANOVA's are used. The results of the one-way ANOVA show that there is a significant difference in perceived quality between the three conditions, with a large effect size ($F(2, 108) = 26.73$, $p < .001$, $\eta^2 = .33$). To determine which specific groups differ from each other, post hoc tests were conducted. Post-hoc analyses using Bonferroni revealed significant differences in perceived quality between the label types. Specifically, the certified eco-label was perceived to have significantly higher perceived quality compared to both the non-certified eco-label ($p = 0.03$) and the control label ($p < .001$). Additionally, there was a significant difference between non-certified eco-labels and control labels, with non-certified being perceived higher in quality ($p < .001$). So, the significance levels indicate strong evidence that eco-label type affects perceived quality, with certified eco-labels generally receiving the highest perceived quality scores, followed by non-certified eco-labels, and then control labels. Based on these results, H_1 is supported.

Perceived eco-label credibility. Likewise, for the effect of label type on perceived eco-label credibility, one-way ANOVA's are used. The one-way ANOVA for perceived eco-label credibility revealed that there is a significant differences in perceived credibility between the three conditions, with a large effect size ($F(2, 108) = 53.48$, $p < .001$, $\eta^2 = .50$). The results from the post-hoc analyses using Bonferroni revealed that certified eco-labels are significantly perceived to be more credible than both non-certified eco-labels ($p < .001$) and control labels ($p < .001$). Similarly to perceived quality, non-certified eco-labels are perceived to be significantly more credible than control labels ($p < .001$). Based on the results, H_2 is supported. The results of the one-way ANOVA's can be found in Appendix K.

4.3 Mediation analyses

The mediation analyses were conducted to investigate whether the perceived credibility of an eco-label mediates the relationship between the type of eco-label (certified vs. non-certified) and the perceived quality of a clothing product. Two separate mediation analyses were performed using the PROCESS macro in SPSS (Model 4), with EcoType1 (1 = certified eco-label, 0 = non-certified eco-label and control label) and EcoType2 (1 = non-certified eco-label, 0 = certified eco-label and control label) as independent variables, PerCre (Total perceived credibility) as the mediator, and PerQua (Total perceived quality) as the dependent variable. The results of the mediation analyses can be found in Appendix L.

4.3.1 Effect of type of label on perceived eco-label credibility (path a)

Certified eco-label. The model summary indicates that EcoType1 (certified eco-label) accounts for 42.14% of the variance in perceived credibility ($R^2 = 0.42$, $F(1, 109) = 79.39$, $p < .001$). Furthermore, the results show that the certified eco-label has a significant effect on perceived credibility (PerCre). The coefficient for EcoType1 is 1.8088 ($p < .001$), with a 95% confidence interval [1.4064, 2.2111].

Non-certified eco-label. The model summary indicates that EcoType2 (non-certified eco-label) accounts for only 1.23% of the variance in perceived credibility ($R^2 = 0.01$, $F(1, 109) = 1.35$, $p = .25$). In contrast with the certified eco-label, the non-certified eco-label does not have a significant effect on perceived credibility. The coefficient for EcoType 2 is -0.3068 ($p = .25$), with a 95% confidence interval [-0.8293, 0.2157].

4.3.2 Effect of perceived eco-label credibility on perceived quality (path b)

Certified eco-label. The model summary indicates that perceived credibility accounts for 39.41% of the variance in perceived quality ($R^2 = 0.39$, $F(2, 108) = 35.12$, $p < .001$). Perceived credibility (PerCre) has a significant positive effect on perceived quality (PerQua) when the label is certified. The coefficient is 0.4709 ($p < .001$), with a 95% confidence interval [0.3161, 0.6257].

Non-certified eco-label. The model summary indicates that perceived credibility accounts for 41.73% of the variance in perceived quality ($R^2 = 0.42$, $F(2, 108) = 38.67$, $p < .001$). Similarly, for EcoType2 (non-certified eco-label), perceived credibility also significantly influences perceived quality. The coefficient is 0.5108 ($p < .001$), with a 95% confidence interval [0.3963, 0.6270].

These findings confirm that perceived credibility positively influences perceived quality, supporting H_3.

4.3.3 Relative direct effects (path c')

Certified eco-label. The direct effect of EcoType1 (certified eco-label) on perceived quality is not significant (b = 0.1116, t = 0.51, $p = .61$, 95% [-0.3197, 0.5430]).

Non-certified eco-label. In contrast with the certified eco-label, the direct effect of EcoType2 (non-certified eco-label) on perceived quality is significant (b = 0.3472, t = 2.14, $p = .03$, 95% [0.0255, 0.6690]).

4.3.4 Mediation effect

To examine whether perceived credibility mediates the relationship between label type and perceived quality, a percentile bootstrap confidence interval is calculated using the PROCESS macro. This confidence interval helps determine if the indirect effect is significant. According to Hayes and Preacher (2014), mediation is present when at least one of the indirect effect confidence intervals does not include zero. Table 4.4 provides these confidence intervals for the indirect effects of perceived credibility.

Table 4.4 Bootstrap intervals (95% confidence) for indirect effects perceived credibility.

Comparison	**Lower**	**Upper**
Certified vs. non-certified and control	0.5897	1.1446
Non-certified vs. certified and control	-0.4070	0.0903

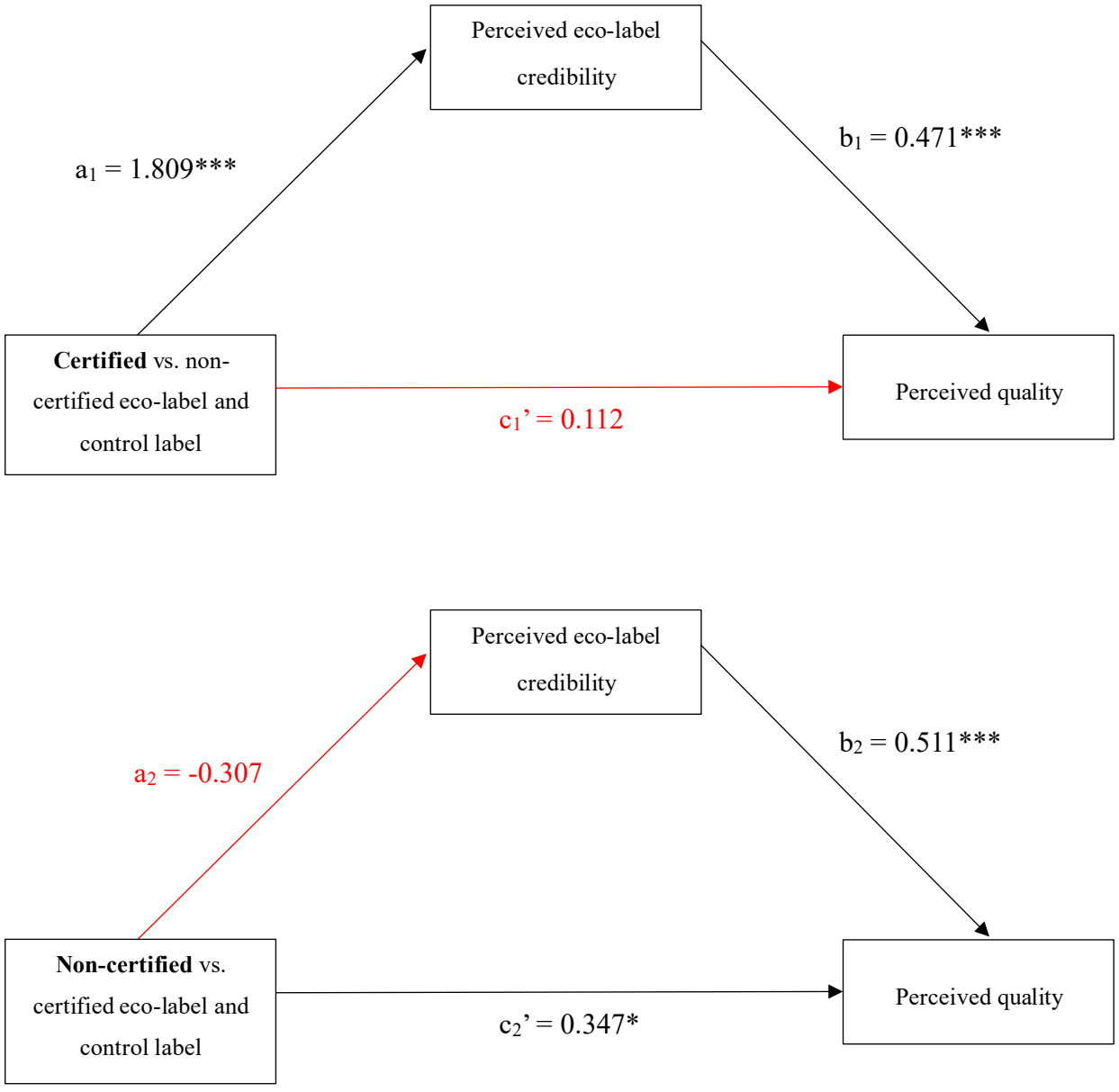
The bootstrap confidence intervals in Table 4.4 show that the interval for EcoType1 excludes zero, while the interval for EcoType2 includes zero.

Certified eco-label. The mediation effect of perceived credibility on the relationship between EcoType1 (certified eco-label) and perceived quality is significant (b = 0.8518). Since the confidence interval does not include zero, it can be concluded that perceived credibility positively mediates the relationship between certified eco-labels and perceived quality. Therefore, H_{4a} is supported.

Non-certified eco-label. For EcoType2 (non-certified eco-label), the mediation effect through credibility is not significant (b = -0.1567). Since the interval includes zero, it can be concluded that perceived credibility does not mediate the relationship between non-certified

eco-labels and perceived quality. Thus, H_{4b} is not supported. Figure 4.1 shows an overview of the estimated coefficients, with the red arrow indicating the insignificant path.

Figure 4.1 Models overview with estimated coefficients.



*Statistically significant at p < .05, ** p < .01, *** p < .001

4.4 Summary of the results

In summary, the results revealed significant differences in perceived quality and credibility across certified, non-certified and control label groups, with certified eco-labels rated highest for both variables. Hypotheses testing confirmed that eco-label presence enhances perceived quality, and that a certified eco-label are perceived as more credible than a non-certified eco-label. Additionally, the mediation analyses showed that there exists a positive relationship between perceived credibility and perceived quality. The results indicate that perceived credibility fully mediates the relationship between a certified eco-label and perceived quality, but does not mediate the relationship between a non-certified eco-label and perceived quality. An overview of the supported and non-supported hypotheses is presented in Table 4.5.

Table 4.5 Overview of the supported and non-supported hypotheses.

Hypothesizes	
H_1: The presence of an eco-label positively affects consumers' perceived quality of a clothing product compared to a clothing product without an eco-label.	Supported
H_2: A certified eco-label is perceived as more credible by consumers than a non-certified eco-label in the fashion industry.	Supported
H_3: The perceived credibility of an eco-label positively influences consumers' perceived quality of a clothing product.	Supported
H_{4a}: The perceived credibility of an eco-label positively mediates the relationship between a certified eco-label and the perceived quality of the clothing product.	Supported
H_{4b}: The perceived credibility of an eco-label negatively mediates the relationship between a non-certified eco-label and the perceived quality of the clothing product.	Not supported

5 DISCUSSION

This final section offers a comprehensive discussion of the study. This study aimed to explore the relationship between eco-label types and the perceived quality of clothing products, mediated by perceived eco-label credibility. Initially, the results of the study are examined, followed by an exploration of theoretical and practical implications. Next, the limitations of the study are addressed, along with recommendations for future research. Finally, conclusions are drawn based on the findings discussed.

5.1 Interpretation of the results

The findings of this study offer important insights within the theoretical framework grounded in signaling theory and the concepts of eco-labeling, perceived quality, and eco-label credibility in the fashion industry. Signaling theory was used to explore how eco-labels serve as extrinsic quality cues, particularly in situations of information asymmetry, where consumers lack direct access to product-related details (Akdeniz et al., 2013). In such contexts, consumers often rely on signals like eco-labels to assess the quality of clothing products (Forsythe et al., 1996).

The results of this study are consistent with existing literature, reinforcing the idea that eco-labels serve as evaluative signals that help consumers make judgments about product quality. The significant findings showed that consumers assessed the intrinsic qualities of clothing products—such as durability and workmanship—based on the presence of eco-labels. Thereby, the control group serves as a functional baseline in this study as it allows for a significant comparison of consumer perceptions in the absence of eco-labels. So, the results align with the core principle of signaling theory, which posits that eco-labels function as

extrinsic signals of unobservable, intrinsic attributes of a product (Aakkoo & Niinimäki, 2021).

The following sections will further explain the relationship between the types of eco-labels, perceived quality, and perceived credibility, illustrating how signaling theory explains the differences observed in consumer responses.

5.1.1 Eco-labels as signals of quality

The study's results show that the presence of an eco-label—whether certified or non-certified—positively affects perceived quality of clothing products compared to the absence of an eco-label, confirming H_1. Interestingly, while the numerical difference in perceived quality between the certified eco-label and the non-certified eco-label is relatively small, the large effect size indicates that this difference is practically meaningful. This suggests that both types of eco-labels, whether third-party certified or not, significantly influence how consumers perceive product quality. However, the large effect size highlights that certified labels, in particular, may have a stronger impact on perceived quality.

Overall, these findings reveal that eco-labels, whether certified or not, serve as signals of quality to consumers, making consumers more likely to consider clothing products with an eco-label better than clothing products without such labels. This aligns with Parkinson's (1975) research, which found that products with labels or seals tend to be viewed more favorably by consumers compared to those without. Further discussion of these findings will be presented in Section 5.1.4 (Mediation effect of perceived credibility), where the mediation effects of perceived credibility on perceived quality are elaborated.

5.1.2 Eco-labels and perceived credibility

The analysis further showed that the certified eco-label is perceived as significantly more credible than the non-certified eco-label by consumers, supporting H_2. Specifically, the certified Fairtrade Cotton label is perceived as more credible than the self-declared "Eco" label and the control label. This result supports De Chiara's (2015) assertion that labels certified by a third-party organization are likely to be perceived as more credible than those originating from businesses themselves. This finding further aligns with the results of Albermeier et al. (2018), who found that consumers perceive self-declared labels as less credible than certified labels. According to Brach et al. (2017), certified labels tend to inspire greater trust among consumers compared to labels without certification, which explains the difference in results for perceived credibility between the certified and non-certified eco-label.

Overall, the findings confirm the conclusions of Pancer et al. (2017) and Roe and Sheldon (2017), which suggest that third-party certification is one of the most effective mechanisms for enhancing the perceived credibility of eco-label claims. They explain that third-party certification serves as a trust-enhancing mechanism by reducing information asymmetry and providing consumers with a sense of assurance regarding the credibility of these claims.

Furthermore, the results indicate that consumers tend to have a neutral perception of the credibility of the non-certified eco-label. This suggests that consumers still have some confidence in the non-certified eco-label, despite its lack of third-party certification. While certification generally increases credibility, consumers may still give the non-certified eco-label the benefit of the doubt if they perceive it as a genuine attempt at sustainability or ethics (Darnall et al., 2016).

Conversely, the neutral score may also indicate underlying skepticism (Connelly et al., 2011; Sirieix et al., 2013; Atkinson & Rosenthal, 2014; Delmas & Gergaud, 2021). The absence of third-party certification may lead some consumers to question the authenticity of the eco-label

claim made by the non-certified eco-label, but not necessarily dismiss it. As Delmas and Gergaud (2021) explain, consumers may lack the tools or information to fully evaluate the truthfulness of eco-label claims, especially when they are not backed by recognized independent verification. Thus, consumers may either tentatively trust or remain hesitant about the non-certified eco-label, reflecting both the potential risk of greenwashing and the possibility that the label represents honest sustainability or ethical efforts. This ambiguity further illustrates the challenging nature of making informed consumption choices, as noted in previous research (Darnall et al., 2016; Gosselt et al., 2017).

5.1.3 Perceived credibility and perceived quality

The mediation analyses reveal a strong positive relationship between perceived credibility and perceived quality, supporting H_3. This finding reinforces signaling theory and aligns with the work of Boulding & Kirmani (1993) and Kirmani & Rao (2000), who found a significant link between the credibility of signals and consumers' perceptions of product quality; when consumers view a signal as credible, they are more likely to associate the product with higher quality. This is consistent with Moussa & Touzani (2008), who suggested that credible labels help reduce uncertainty about a product's quality, thus enhancing overall quality perceptions (Aakko & Niinimäki, 2021). The relationship between perceived credibility and perceived quality for the different types of eco-labels is further explained in the next section, which discusses the mediation effect of perceived credibility.

5.1.4 Mediation effect of perceived credibility

The mediation analyses validated the theoretical assumption that perceived credibility positively mediates the relationship between certified eco-labels and perceived quality,

supporting H_{4a}. The full mediation effect confirms that in this study perceived credibility is indeed the mechanism through which the certified eco-label influences product quality perceptions. This result aligns with signaling theory, suggesting that credible signals reduce information asymmetry, where consumers cannot fully evaluate the quality of a product, thereby reducing uncertainty and fostering trust in consumers' product choices (Erdem & Swait, 2004; Moussa & Touzani, 2008; Conelly et al., 2011). So, the higher the perceived credibility of the signal, the stronger its impact on consumer judgment of the product, supporting earlier findings on signal credibility by Connelly et al. (2011), and brand credibility by Erdem and Swait (2004).

In contrast, H_{4b} was not supported, as the mediation effect of perceived credibility on the relationship between the non-certified eco-label and perceived quality was not significant. Although the absence of third-party verification for the non-certified eco-label diminishes its credibility, leading consumers to question the validity of the "Eco" claim (Pancer et al., 2017; Roe & Sheldon, 2017; Delmas & Gergaud, 2021), this decrease in credibility has no significant effect on consumer perceptions of product quality.

Furthermore, as discussed in Section 5.1.1 (Eco-labels as signals of quality), the findings reveal that the presence of any eco-label, whether certified or non-certified, positively influences consumer perceptions of quality. This is consistent with Jin et al. (2017), who found that eco-labels, even if self-declared, serve as external cues that positively signal sustainable or ethical practices.

An explanation for this can be that non-certified eco-labels might benefit from the broader halo effect of eco-labelling (Szabo & Webster, 2020; Lanero et al., 2021). This entails that the presence of any label suggests environmental or social responsibility, which can lead consumers to assume positive attributes about the product, even in the absence of third-party certification (Lanero et al., 2021). In this matter, even vague or exaggerated green marketing

efforts can lead to a positive halo effect on product perceptions (Szabo and Webster, 2020). This phenomenon can also apply to clothing products, where the presence of any eco-label – whether certified or not – can lead consumers to associate the product with sustainability or ethical practices, thereby increasing perceived quality. However, while non-certified eco-labels may benefit from this effect, their lack of credible certification diminishes their overall impact compared to certified eco-labels (Lanero et al., 2021).

In conclusion, these results emphasize the central role of credibility in the effectiveness of eco-labels (Erdem & Swait, 2004; Connelly et al., 2011; Atkinson & Rosenthal, 2014). Perceived credibility acts as a mediator between the certified eco-label, Fairtrade Cotton, and perceived product quality, as the certified label is viewed as a more reliable and trusted signal than the non-certified "Eco" label. This finding underscores the impact of third-party certification in enhancing consumer trust and confidence a product's perceived quality, in line with the conclusions of previous studies on the influence of credibility in consumer decision-making (Pancer et al., 2017; Roe & Sheldon, 2017). While non-certified eco-labels can also contribute to positive perceptions of product quality due to the halo effect, their lack of external verification limits their credibility, thereby limiting their overall effectiveness in shaping consumer evaluations.

5.1.5 The research question

This study addresses the research question:

"How do eco-labels on clothing influence consumers' perceived product quality, and to what extent does perceived eco-label credibility mediate the relationship between certified and non-certified eco-labels and consumers' perceived product quality in the fashion industry?"

The results show that eco-labels positively influence perceived product quality, with certified labels having the most significant impact. Products with both certified and non-certified eco-labels were rated higher in quality compared to the control group, but certified eco-labels led to stronger quality perceptions due to their higher credibility. Mediation analyses confirmed that for certified eco-labels, perceived credibility fully explains the positive relationship between the label and perceived quality. This means that consumers rely on the credibility of the certified label to form higher quality perceptions.

In contrast, the perceived credibility of non-certified eco-labels did not mediate the relationship with perceived quality. This suggests that while the absence of third-party verification diminishes the non-certified eco-label's credibility, this reduced credibility does not have a strong enough influence to affect consumers' perceptions of the product's quality. Non-certified eco-labels still positively affect quality perceptions, possibly benefiting from the halo effect associated with eco-labeling. Overall, eco-labels, particularly certified ones, enhance perceived quality by signaling reliability and sustainability.

5.2 Theoretical implications

This study contributes to the theoretical knowledge by advancing the application of signaling theory within the context of eco-labels in the fashion industry. Previous research has mainly focused on the presence of eco-labels and their influence on consumer decisions, but this study delves deeper by comparing the effects of Type I (certified) and Type II (non-certified) eco-labels on perceived product quality. The findings highlight the significant role of perceived credibility as a mediator between eco-labels and perceived quality, specifically showing that certified eco-labels are more effective in enhancing consumer perceptions of product quality due to their greater perceived credibility. This reinforces signaling theory's notion that credibility of the signal—in this case, third-party certification—strengthens the impact of the signal on consumer judgment. Thus, this study expands the application of signaling theory by illustrating how different types of eco-labels (certified and non-certified) serve as extrinsic quality cues, particularly under conditions of information asymmetry. Moreover, the study enhances existing literature by exploring how the absence of third-party certification affects consumer perceptions, offering a nuanced view of the role of credibility in the eco-labeling process.

5.3 Practical implications

From a practical standpoint, this research offers actionable insights for consumers, fashion brands, retailers, suppliers and policymakers. The results highlight the importance of third-party certification in eco-labels to enhance consumer trust and positively influence product evaluations.

As the number of consumers seeking sustainable products continues to grow (Ceylan, 2019), this study can help them make more informed purchase decisions by encouraging them to prioritize clothing products with certified eco-labels, such as the Fairtrade Cotton label,

reducing the risk of falling for greenwashing practices. Thereby, green marketing or CSR managers of clothing brands can leverage certified eco-labels to differentiate their products and enhance consumer perceptions of quality, potentially increasing customer satisfaction and loyalty (Chen & Chang, 2013; McClusky & Loureiro, 2003; Das, 2015). The study also suggests that while non-certified eco-labels can still positively influence consumer perceptions due to the halo effect, their impact is limited by their lower credibility. Hence, companies that rely on non-certified eco-labels may need to consider transitioning to third-party certifications to build long-term trust with their consumers and mitigate consumer skepticism (Sirieix et al., 2013; Darnall et al., 2016; Delmas & Gergaud, 2021). Specifically, this study shows that the 'Fair Trade Certified™ Cotton' label has a positive impact on both perceived credibility and perceived quality. As a result, retailers and buyers are encouraged to prioritize sourcing from suppliers that feature this label, as it not only strengthens consumer trust and perceived product quality but more importantly supports certified ethical and sustainable practices within the global cotton industry (Fairtrade Cotton, 2024).

For policymakers, the findings underscore the need to strengthen eco-label certification standards and increasing transparency to combat greenwashing and ensure the authenticity of environmental claims. As the European Parliament moves toward mandating sustainability and circularity disclosures on textile labels by 2024, these insights can inform the development of more effective regulations that enhance consumer confidence in these labels (Albersmeier et al., 2010; Nikolaou & Kazantzidis, 2016; European Parliament, 2024). One potential regulatory approach could involve developing a universally recognizable symbol that clearly indicates whether an eco-label in fashion is certified by a third party or not. In addition, policymakers could also advocate for more public awareness campaigns that educate consumers about the differences between certified and non-certified eco-labels in fashion, empowering them to make more informed decisions (Taufique et al., 2016).

In summary, the research offers valuable guidelines for stakeholders in the fashion industry to align their strategies with consumer expectations for sustainability and quality, thereby contributing to the broader goals of verified environmental protection and ethical consumerism.

5.4 Limitations and future research

Although this study provides valuable insights, the design of the current study is subject to several limitations that can be improved for future research.

First, the sample consisted of only Dutch consumers, which may restrict the generalizability of the findings to other cultural context. Cultural differences can significantly influence consumer perceptions and behaviors regarding eco-labels, as previous studies have shown variations in environmental attitudes and trust in certifications across cultures (Laroche et al., 2001; Thøgersen et al., 2010). The use of convenience sampling further complicates the generalizability of the findings, making it difficult to apply the results broadly (Bryman, 2008). Future research should involve larger and more diverse samples to improve generalizability.

Conducting the study online further introduces limitations related to how participants engage with the stimuli compared to a physical shopping environment. Future research could benefit from utilizing more interactive elements in the stimuli and exploring real-life shopping behaviors. This would allow for more research into how eco-labels influence consumer purchasing behavior by enhancing perceived product quality (Zhao et al., 2022; Wasaya et al., 2023), examining whether eco-labels effectively bridge the gap between consumers' sustainable attitudes and their actual buying decisions (Testa et al., 2013). Additionally, qualitative research methods, such as interviews and focus groups, could complement the

quantitative findings by providing deeper insights into consumer attitudes and motivations regarding eco-labels and sustainable fashion. These methods can uncover the underlying reasons for consumer trust or skepticism towards different types of eco-labels.

Moreover, the experimental design focused on two specific clothing items, a T-shirt and a blazer, which might not fully capture the variability in consumer responses to different types of fashion products. This narrow focus limits the understanding of how eco-labels influence perceived quality across various product categories. Future research should expand the range of products to include a broader spectrum of fashion items, such as casual wear, sportswear, and high-end fashion, to provide a more comprehensive understanding of the effects of eco-labels in the fashion industry.

Furthermore, using a single fake control label might not capture the full spectrum of baseline perceptions against which certified and non-certified eco-labels should be compared. Future research should consider including a variety of control conditions to ensure broader applicability and generalizability of the results. In addition, the study's focus on eco-labels as the sole extrinsic cue may not reflect real-life scenarios where multiple cues, such as brand name, price, and packaging, interact to influence consumer perceptions. Dodds et al. (1991) found that when multiple extrinsic cues are present, the effect of each cue on perceived quality may differ. To better simulate real-life consumer decision-making, future research should include additional extrinsic cues to investigate their combined effects on perceived quality and eco-label credibility.

Additionally, the study utilized a certified eco-label that scored highest in familiarity among participants. Prior research suggests that familiarity with a label can increase its perceived credibility, as consumers are more likely to trust information they recognize or have encountered before (Hoyer & Brown, 1990). This familiarity bias might have influenced the study's findings. Future research should investigate whether credibility truly mediates the

relationship between eco-labels and perceived quality by examining other certified eco-labels that are less familiar to consumers. Researchers can determine if the positive effects observed in this study are driven by the label's certification status or by the participants' prior exposure or recognition of the label. This approach would provide more insight into whether the impact of eco-labels is generalizable beyond highly familiar eco-labels in fashion.

By addressing these limitations and expanding the scope of inquiry, future research can build on the findings of this study to offer deeper insights into the role of eco-labels in promoting sustainable consumption and influencing consumer behavior in the fashion industry.

5.5 Conclusion

This thesis examined the influence of eco-labels on consumers' perceived product quality in the fashion industry, with a focus on how the credibility of these labels mediates this relationship. Using signaling theory as a framework, the study confirms that eco-labels enhance perceived quality compared to products without such labels. The study emphasized that perceived credibility plays a mediating role in this relationship, which was key to understanding this dynamic. Certified eco-labels, in particular, were viewed as the most credible, thereby having a stronger positive effect on quality perception. While non-certified labels still had a positive influence on perceived quality, their lower credibility—likely driven by consumer skepticism—diminished their overall impact.

This research advances the understanding of sustainable consumption and signaling theory and provides valuable insights for consumers, green marketers, clothing brands, retailers, suppliers, policy makers, and researchers seeking to promote sustainable fashion and strengthen consumer confidence in sustainable clothing products. By addressing the identified

limitations and following the proposed future research directions, the influence of eco-labels in the fashion industry on consumer behavior can be further explored and expanded.

6 REFERENCES

Aakko, M., & Niinimäki, K. (2021). Quality matters: reviewing the connections between perceived quality and clothing use time. *Journal of Fashion Marketing and Management*, *26*(1), 107–125. https://doi.org/10.1108/jfmm-09-2020-0192

Aertsens, J., Mondelaers, K., Verbeke, W., Buysse, J., & Van Huylenbroeck, G. (2011). The influence of subjective and objective knowledge on attitude, motivations and consumption of organic food. *British Food Journal*, *113*(11), 1353–1378. https://doi.org/10.1108/00070701111179988

Akdeniz, M.B., Calantone, R.J., & Voorhees, C.M. (2014). Signaling quality: an examination of the effects of marketing and nonmarketing-controlled signals on perceptions of automotive brand quality. *Journal of Product Innovation Management*, *31*(4), 728-743.

Asiamah, N., Mensah, H. K., & Oteng-Abayie, E. F. (2017). General, target, and accessible population: Demystifying the concepts for effective sampling. *the Qualitative Report*. https://doi.org/10.46743/2160-3715/2017.2674

Albersmeier, F., Schulze, H., & Spiller, A. (2010). System dynamics in food Quality Certifications: Development of an audit integrity system. *DOAJ (DOAJ: Directory of Open Access Journals)*. https://doaj.org/article/5f2987d487854e4b884534decd12e296

Alhabeeb, M. J. (2007). Consumers' cues for product quality: an application of the signaling theory. In *Allied Academies International Conference. Academy of Marketing Studies: Proceedings*, *12*(2), 1-6.

Alvi, M. (2016). A manual for selecting sampling techniques in research. *MPRA Paper*. https://ideas.repec.org/p/pra/mprapa/70218.html

Atkinson, L. J., & Rosenthal, S. (2014). Signaling the green sell: the influence of Eco-Label source, argument specificity, and product involvement on consumer trust. *Journal of Advertising*, *43*(1), 33–45. https://doi.org/10.1080/00913367.2013.834803

Balasubramanian, S. K., & Cole, C. (2002). Consumers' Search and Use of Nutrition Information: The Challenge and Promise of the Nutrition Labeling and Education Act. *Journal of Marketing*, *66*(3), 112–127. https://doi.org/10.1509/jmkg.66.3.112.18502

Bhuian, S. N. (1997). Marketing cues and perceived quality: Perceptions of Saudi consumers toward products of the U.S., Japan, Germany, Italy, U.K. and France. *Journal of Quality Management*, *2*(2), 217–234. https://doi.org/10.1016/s1084-8568(97)90004-3

Blengini, G. A., & Shields, D. J. (2010). Green labels and sustainability reporting. *Management of Environmental Quality: An International Journal*, *21*(4), 477–493. https://doi.org/10.1108/14777831011049115

Boulding, W., & Kirmani, A. (1993). A Consumer-Side Experimental Examination of signaling Theory: Do consumers perceive warranties as signals of quality? *The Journal of Consumer Research/Journal of Consumer Research*, *20*(1), 111. https://doi.org/10.1086/209337

Brach, S., Walsh, G., & Shaw, D. (2017). Sustainable consumption and third-party certification labels: Consumers' perceptions and reactions. *European Management Journal*, *36*(2), 254–265. https://doi.org/10.1016/j.emj.2017.03.005

Bryman, A. (2008). Social research methods (3rd ed.). Oxford: Oxford University Press.

Byrd, K., & Su, J. (2020). Investigating consumer behaviour for environmental, sustainable and social apparel. *International Journal of Clothing Science and Technology*, *33*(3), 336–352. https://doi.org/10.1108/ijcst-03-2020-0040

Carmona, M. (2011). Eco-labels as signals: the role of credibility and reputation. *DOAJ (DOAJ: Directory of Open Access Journals)*. https://doaj.org/article/d34a6c416a6f4a8d81eb730a2ee260b0

Carrigan, M., & Attalla, A. (2001). The myth of the ethical consumer – do ethics matter in purchase behaviour? *Journal of Consumer Marketing*, *18*(7), 560–578. https://doi.org/10.1108/07363760110410263

Ceylan, Ö. (2019). Knowledge, attitudes and behavior of consumers towards sustainability and ecological fashion. *Textile & Leather Review*, *2*(3), 154–161. https://doi.org/10.31881/tlr.2019.14

Centraal Bureau voor de Statistiek. (2024). *Bevolkingspiramide*. Centraal Bureau Voor De Statistiek. https://www.cbs.nl/nl-nl/visualisaties/dashboard-bevolking/bevolkingspiramide

Chang, T., Chen, Y., Yeh, Y., & Li, H. (2020). Sustainable consumption models for customers: investigating the significant antecedents of green purchase behavior from the perspective of information asymmetry. *Journal of Environmental Planning and Management*, *64*(9), 1668–1688. https://doi.org/10.1080/09640568.2020.1837087

Chang, N., & Fong, C. (2010). Green product quality, green corporate image, green customer satisfaction, and green customer loyalty. *African Journal of Business Management*, *4*(13), 2836–2844. https://doi.org/10.5897/ajbm.9000310

Chang, T., & Wildt, A. R. (1994). Price, product information, and purchase intention: an Empirical study. *Journal of the Academy of Marketing Science*, *22*(1), 16–27. https://doi.org/10.1177/0092070394221002

Charness, G., Gneezy, U., & Kuhn, M. A. (2012). Experimental methods: Between-subject and within-subject design. *Journal of Economic Behavior & Organization*, *81*(1), 1–8. https://doi.org/10.1016/j.jebo.2011.08.009

Cheah, L., & Huang, Q. (2021). Comparative Carbon Footprint Assessment of Cross-Border E-Commerce Shipping Options. *Transportation Research Record*, *2676*(1), 584–595. https://doi.org/10.1177/03611981211037249

Chen, Y. S., & Chang, C. H. (2013). Towards green trust. *Management Decision*, *51*(1), 63 82. https://doi.org/10.1108/00251741311291319

Chen, Y. S., & Chang, C. H. (2012). Enhance green purchase intentions. *Management Decision*, *50*(3), 502–520. https://doi.org/10.1108/00251741211216250

Chi, H., Yeh, H., & Yang, Y. (2009). The impact of brand awareness on consumer purchase intention: The mediating effect of perceived quality and brand loyalty. *The Journal of International Management Studies*. http://nhuir.nhu.edu.tw/bitstream/987654321/27159/1/The+Impact+of+Brand.pdf

Cho, Y., Soster, R. L., & Burton, S. (2017). Enhancing environmentally conscious consumption through standardized sustainability information. *The Journal of Consumer Affairs/the Journal of Consumer Affairs*, *52*(2), 393–414. https://doi.org/10.1111/joca.12172

Choi, E. J., & Kim, S. H. (2013). The study of the impact of perceived quality and value of social enterprises on customer satisfaction and re-purchase intention. *International journal of smart home*, *7*(1), 239-252.

Christensen, L. (2007). Experimental methodology. Boston: Pearson.

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling Theory: A Review and assessment. *Journal of Management*, *37*(1), 39–67. https://doi.org/10.1177/0149206310388419

Crespi, J., & Marette, S. (2005). Eco-labelling economics : is public involvement necessary ? In *HAL (Le Centre pour la Communication Scientifique Directe)*. https://hal.inrae.fr/hal-02828114

Darnall, N. (2008). Creating a green brand for competitive distinction. *Asian Business & Management (Print)*, *7*(4), 445–466. https://doi.org/10.1057/abm.2008.19

Darnall, N., Ji, H., & Vázquez-Brust, D. A. (2016). Third-Party certification, sponsorship, and consumers' ecolabel use. *Journal of Business Ethics*, *150*(4), 953–969. https://doi.org/10.1007/s10551-016-3138-2

Darnall, N., Ponting, C., & Vazquez-Brust, D. A. (2012). *Why consumers buy green* (pp. 287-308). Springer Netherlands.

Das, G. (2015). Linkages between self-congruity, brand familiarity, perceived quality and purchase intention: A study of fashion retail brands. *Journal of Global Fashion Marketing*, *6*(3), 180–193. https://doi.org/10.1080/20932685.2015.1032316

De Boer, J. (2003). Sustainability labelling schemes: the logic of their claims and their functions for stakeholders. *Business Strategy and the Environment*, *12*(4), 254–264. https://doi.org/10.1002/bse.362

De Chiara, A. (2015). Eco-labeled products: trend or tools for sustainability strategies? *Journal of Business Ethics*, *137*(1), 161–172. https://doi.org/10.1007/s10551-014-2510-3

Della Porta, D. (2008). Comparative analysis: case-oriented versus variable-oriented research. In *Cambridge University Press eBooks* (pp. 198–222). https://doi.org/10.1017/cbo9780511801938.012

Delmas, M. A., & Gergaud, O. (2021). Sustainable practices and product quality: Is there value in eco-label certification? The case of wine. *Ecological Economics, 183, 106953.* https://doi.org/10.1016/j.ecolecon.2021.106953

Dodds, W. B., Monroe, K. B., & Grewal, D. (1991). Effects of price, brand, and store information on buyers' product evaluations. *Journal of Marketing Research*, *28*(3), 307. https://doi.org/10.2307/3172866

D'Souza, C., Taghian, M., & Lamb, P. (2006). An empirical study on the influence of environmental labels on consumers. *Corporate Communications an International Journal*, *11*(2), 162–173. https://doi.org/10.1108/13563280610661697

Eisend, M. (2002) Dimensions of credibility in marketing communication. *Asia Pacific Advances in Consumer Research*, *5*, 366–373.

Emerson, R. W. (2022). ANOVA assumptions. *Journal of Visual Impairment & Blindness, 116*(4), 585–586. https://doi.org/10.1177/0145482x221124187

Erdem, T., & Swait, J. (2004). Brand credibility, brand consideration, and choice. *The Journal of Consumer Research/Journal of Consumer Research, 31*(1), 191–198. https://doi.org/10.1086/383434

Etz, K. E., & Arroyo, J. A. (2015). Small sample research: Considerations beyond Statistical power. *Prevention Science*, *16*(7), 1033–1036. https://doi.org/10.1007/s11121-015-0585-4

European Parliament. (2024, February 20). *EU Strategy for sustainable and circular textiles | Legislative Train Schedule*. https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-eu-textiles-strategy

Fairtrade Cotton. (2024). Fairtrade International. Retrieved April 17, 2024, from https://www.fairtrade.net/product/cotton

Feuß, S., Fischer, D., Majer, J. M., Kemper, J., & Brettel, M. (2022). The interplay of eco-labels and price cues: Empirical evidence from a large-scale field experiment in an

online fashion store. *Journal of Cleaner Production*, *373*, 133707. https://doi.org/10.1016/j.jclepro.2022.133707

Forsythe, S., Presley, A. B., & Caton, K. W. (1996). Dimensions of apparel quality influencing consumers' perceptions. *Perceptual and Motor Skills*, *83*(1), 299–305. https://doi.org/10.2466/pms.1996.83.1.299

Garvin, D. A. (1983). Quality on the line. *Harvard Business Review*, 65–75. https://ci.nii.ac.jp/naid/10026459836/

Garvin, D. (1984), "What does 'product quality' really mean?", *Sloan Management Review*, Fall, Vol. 26 1 (Fall), pp. 25-43.

Gallastegui, I. G. (2002). The use of eco-labels: a review of the literature. *European Environment*, *12*(6), 316–331. https://doi.org/10.1002/eet.304

Globescan. (2023, May 31). *Consumer support for fairtrade remains strong despite global cost of living crisis*. GlobeScan | Know Your World. Lead the Future. https://globescan.com/2023/05/31/consumer-support-for-fairtrade-remains-strong-despite-global-cost-of-living-crisis/

González, D. H. (2020). Influence of variables to reduce the intention and behaviour purchase gaps in Eco-Label food products. *Multidisciplinary Business Review*, *13*(1), 71–81. https://doi.org/10.35692/07183992.13.1.7

Gosselt, J. F., Van Rompay, T., & Haske, L. (2017). Won't get fooled Again: the effects of internal and external CSR ECO-Labeling. *Journal of Business Ethics*, *155*(2), 413–424. https://doi.org/10.1007/s10551-017-3512-8

Hahnel, U. J., Arnold, O., Waschto, M., Korcaj, L., Hillmann, K., Roser, D., & Spada, H. (2015). The power of putting a label on it: green labels weigh heavier than contradicting product information for consumers' purchase decisions and post-purchase behavior. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01392

Harpe, S. E. (2015). How to analyze Likert and other rating scale data. *Currents in Pharmacy Teaching and Learning*, *7*(6), 836–850. https://doi.org/10.1016/j.cptl.2015.08.001

Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach: Part II Mediation analysis*. New York: The Guilford Press.

Hayes, A. F., & Preacher, K. J. (2014). Statistical mediation analysis with a multicategorical independent variable. *British Journal of Mathematical and Statistical Psychology*, *67*(3), 451–470. https://doi.org/10.1111/bmsp.12028

Henninger, C. E. (2015). Traceability the new eco-label in the slow-fashion industry?—consumer perceptions and micro-organisations responses. *Sustainability*, *7*(5), 6011–6032. https://doi.org/10.3390/su7056011

Horne, R.E. (2009), "Limits to labels: the role of eco-labels in the assessment of product sustainability and routes to sustainable consumption", International Journal of Consumer Studies, *33*(2), pp. 175-182.

Hoyer, W. D., & Brown, S. P. (1990). Effects of brand awareness on choice for a common,Repeat-Purchase product. *Journal of Consumer Research*, *17*(2), 141. https://doi.org/10.1086/208544

Hyllegard, K. H., Yan, R., Ogle, J. P., & Lee, K. (2012). Socially responsible labeling. *Clothing and Textiles Research Journal*, *30*(1), 51–66. https://doi.org/10.1177/0887302x11433500

Iraldo, F., Grießhammer, R., & Kahlenborn, W. (2020). The future of ecolabels. *The International Journal of Life Cycle Assessment*, *25*(5), 833–839. https://doi.org/10.1007/s11367-020-01741-9

Javeed, A., Mod Mokhtar, S., Lebai, I., & Khan, M. (2017). Perceived product quality: role of extrinsic Cues. *Journal of Managerial Sciences*, *11*(3), 195–220.

Javeed, A., Aljuaid, M., Khan, Z., Mahmood, Z., & Shahid, D. (2022). Role of extrinsic cues in the formation of quality perceptions. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.913836

Jiang, P., Jones, D. B., & Javie, S. (2008). How third-party certification programs relate to consumer trust in online transactions: An exploratory study. *Psychology & Marketing*, *25*(9), 839–858. https://doi.org/10.1002/mar.20243

Jin, Y., MA, Gam, H. J., & Banning, J. (2017). Perceived ease of use and usefulness of sustainability labels on apparel products: application of the technology acceptance model. *Fashion and Textiles*, *4*(1). https://doi.org/10.1186/s40691-017-0093-1

Joemmanbaks, F., & De Graaf, H. (2023). Kiezen voor een "X." In *Rutgers Expertisecentrum Seksualiteit*. Rijksoverheid. https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2023/07/07/tk-bijlage-1-onderzoeksrapport-rutgers-kiezen-voor-een-x/tk-bijlage-1-onderzoeksrapport-rutgers-kiezen-voor-een-x.pdf

Kabaja, B., Wojnarowska, M., Cesarani, M. C., & Varese, E. (2022). Recognizability of ecolabels on e-commerce websites: the case for younger consumers in Poland. *Sustainability*, *14*(9), 5351. https://doi.org/10.3390/su14095351

Keren, G. (2014). Between- or Within-Subjects Design: a methodological dilemma. In *Psychology Press eBooks* (pp. 269–284). https://doi.org/10.4324/9781315799582-14

Kikuchi-Uehara, E., Nakatani, J., & Hirao, M. (2016). Analysis of factors influencing consumers' proenvironmental behavior based on life cycle thinking. Part I: effect of environmental awareness and trust in environmental information on product choice. *Journal of Cleaner Production*, 117, 10–18. https://doi.org/10.1016/j.jclepro.2015.12.030

Kim, H. (2014). Analysis of variance (ANOVA) comparing means of more than two groups. *Restorative Dentistry & Endodontics*, *39*(1), 74. https://doi.org/10.5395/rde.2014.39.1.74

Kim, J. (2010). Perceived Apparel Quality Revisited: Testing of Its Structural Dimensions from the Perspective of the Generation Y Female Consumers. *Journal of Global Fashion Marketing*, *1*(4), 240–249. https://doi.org/10.1080/20932685.2010.10593075

Kirmani, A., & Rao, A. R. (2000). No pain, no gain: A Critical Review of the Literature on Signaling Unobservable Product Quality. *Journal of Marketing*, *64*(2), 66–79. https://doi.org/10.1509/jmkg.64.2.66.18000

Kline, R. B., & Little, T. D. (2015). *Principles and Practice of Structural Equation Modeling, Fourth edition*. http://digilib.ubl.ac.id/index.php?p=show_detail&id=16017

Kolović, T., Vlastelica, T., & Krstić, J. (2023). Consumers' perception of green advertising and eco-labels: The effect on purchasing intentions. *Marketing*, *54*(1), 54–66. https://doi.org/10.5937/mkng2301054k

Kong, W., Harun, A., Sulong, R. S., & Lily, J. (2014). The influence of consumers' perception of green products on green purchase intention. *International Journal of Asian Social Science*, *4*(8), 924–939. http://www.aessweb.com/pdf-files/ijass-2014-4(8)-924-939.pdf

Koszewska, M. (2011). Social and eco-labelling of textile and clothing goods as a means of communication and product differentiation. *Fibres & Textiles in Eastern Europe.* https://www.researchgate.net/profile/Malgorzata_Koszewska/publication/230760641_Social_and_Eco-labelling_of_Textile_and_Clothing_Goods_as_Means_of_Communication_and_Product_Differentiation/links/0fcfd503ff1c35e7f4000000.pdf

Kotler, P. and Keller, K. (2011) "Marketing Management"(14th edition), London: Pearson Education

Kumar, A., & Basu, R. (2023). Do eco-labels trigger green product purchase intention among emerging market consumers? *Journal of Indian Business Research*, *15*(3), 466–492. https://doi.org/10.1108/jibr-09-2022-0248

Kumar, P., Polonsky, M. J., Dwivedi, Y. K., & Kar, A. K. (2021). Green information quality and green brand evaluation: the moderating effects of eco-label credibility and consumer knowledge. *European Journal of Marketing*, *55*(7), 2037–2071. https://doi.org/10.1108/ejm-10-2019-0808

Lanero, A., Vázquez, J., & Sahelices-Pinto, C. (2021). Halo effect and source credibility in the evaluation of food products identified by Third-Party certified Eco-Labels: Can information prevent biased inferences? *Foods*, *10*(11), 2512. https://doi.org/10.3390/foods10112512

Larceneux, F. (2001). Proposition d'une échelle de mesure de la crédibilité d'un signe de qualité. *RePEc: Research Papers in Economics*. https://basepub.dauphine.fr/handle/123456789/4263

Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing*, *18*(6), 503–520. https://doi.org/10.1108/eum0000000006155

Lee, E-J., Bae, J., & Kim, K. H. (2020). The effect of environmental cues on the purchase intention of sustainable products. *Journal of Business Research, 120,* 425-433. https://doi.org/10.1016/j.jbusres.2019.10.048

Lee, J., & Tai, S. W. (2009). Determinants of product quality perceptions and their application to marketing standardisation. *International Journal of Emerging Markets*, *4*(2), 119–136. https://doi.org/10.1108/17468800910945765

Leik, R. (1997). *Experimental design and the analysis of variance*.

https://doi.org/10.4135/9781483348940

Lieb, H., Quattelbaum, B., & Schmitt, R. (2008). Perceived quality as a key factor for strategic change in product development. *2008 IEEE International Engineering Management Conference*. https://doi.org/10.1109/iemce.2008.4617994

Liu, J., Song, Y., & Tong, S. (2017). Sustainable Retailing in the Fashion Industry: A Systematic Literature Review. *Sustainability*, *9*(7), 1266. https://doi.org/10.3390/su9071266

Luo, W., Xu, Y., Lee, H., & Li, A. (2022). Preferred product attributes for sustainable outdoor apparel: A conjoint analysis approach. *Sustainable Production and Consumption*, *29*, 657–671. https://doi.org/10.1016/j.spc.2021.11.011

Majer, J. M., Henscher, H. A., Reuber, P., Fischer-Kreer, D., & Fischer, D. (2022). The effects of visual sustainability labels on consumer perception and behavior: A systematic review of the empirical literature. *Sustainable Production and Consumption*, *33*, 1–14. https://doi.org/10.1016/j.spc.2022.06.012

McCluskey, J. J., & Loureiro, M. L. (2003). Consumer preferences and willingness to pay for food labeling: a discussion of empirical studies. *Journal of Food Distribution Research*, *34*(3), 95–102. https://doi.org/10.22004/ag.econ.27051

Mei, O. J., Ling, K. C., & Piew, T. H. (2012). The Antecedents of Green Purchase Intention among Malaysian Consumers. *Asian Social Science*, *8*(13). https://doi.org/10.5539/ass.v8n13p246

Mexia, A. (2022, January 13). *How to Avoid Unintentional Greenwashing and What is it?* Copy That. https://www.copythatco.com/blog-and-free-tips/what-is-greenwashing-avoid-misleading-marketing

Mirabi, V., Akbariyeh, H., & Tahmasebifard, H. (2015). A study of factors affecting on customers purchase intention. *Journal of Multidisciplinary Engineering Science and Technology (JMEST)*, *22*(1), 267–273.

Mitra, D. and Golder, P.N. (2006), "How does objective quality affect perceived quality? Short-term effects, long-term effects, and asymmetries", Marketing Science, *25*(3), 230-247.

Mohr, D. C., Spring, B., Freedland, K. E., Beckner, V., Arean, P., Hollon, S. D., Ockene, J., & Kaplan, R. (2009). The selection and design of control conditions for randomized controlled trials of psychological interventions. *Psychotherapy and Psychosomatics*, *78*(5), 275–284. https://doi.org/10.1159/000228248

Monroe, K. B., & Krishnan, R. (1985). The effect of price on subjective product evaluations. *Perceived quality*, *1*(1), 209-232.

Morris, J., Koep, L., & Damert, M. (2020). Labels in the textile and Fashion Industry: Communicating Sustainability to effect Sustainable Consumption. In *Springer eBooks* (pp. 257–274). https://doi.org/10.1007/978-3-030-22018-1_14

Morwitz, V. G., Steckel, J. H., & Gupta, A. (2007). When do purchase intentions predict sales? *International Journal of Forecasting*, *23*(3), 347–364. https://doi.org/10.1016/j.ijforecast.2007.05.015

Moussa, S., & Touzani, M. (2008). The perceived credibility of quality labels: a scale validation with refinement. *International Journal of Consumer Studies*, *32*(5), 526–533. https://doi.org/10.1111/j.1470-6431.2008.00713.x

Muijs, D. (2011). Doing quantitative research in education with SPSS. London: Sage Publications Ltd.

Nam, C., Dong, H., & Lee, Y. (2017). Factors influencing consumers' purchase intention of green sportswear. *Fashion and Textiles*, *4*(1). https://doi.org/10.1186/s40691-017-0091-3

Namey, E. E., & Trotter, R. T. (2015). Qualitative research methods. In *SAGE Publications, Inc. eBooks* (pp. 442–482). https://doi.org/10.4135/9781483398839.n15

Nelson, P. (1970), "Information and consumer behavior", *Journal of Political Economy*, *78*(2), 311-329.

Niinimäki, K. (2015), "Sustainable consumer satisfaction in the context of clothing", in Vezzoli, C., Kohtala, C., Srinivasan, A., Diehl, J.C., Fusakul, S.M., Xin, L. and Sateesh, D. (Eds), *Product Service System Design for Sustainability,* Greenleaf, Sheffield, pp. 218-237.

Niinimäki, K., Peters, G., Bontempi, E., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. *Nature Reviews Earth & Environment*, *1*(4), 189–200. https://doi.org/10.1038/s43017-020-0039-9

Nikolaou, I. E., & Kazantzidis, L. (2016). A sustainable consumption index/label to reduce information asymmetry among consumers and producers. *Sustainable Production and Consumption*, *6*, 51–61. https://doi.org/10.1016/j.spc.2016.01.001

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics.

Advances in Health Sciences Education, *15*(5), 625–632. https://doi.org/10.1007/s10459-010-9222-y

NOS. (2024, March 12). *Europarlement steunt aanpakken valse milieuclaims in mode-industrie*. https://nos.nl/artikel/2512534-europarlement-steunt-aanpakken-valse-milieuclaims-in-mode-industrie

Olson, J. C., & Jacoby, J. (1972). Cue utilization in the quality perception process. *ACR Special Volumes*. https://www.acrwebsite.org/search/view-conference-proceedings.aspx?Id=11997

Osborne, J. W., & Overbay, A. (2004). The power of outliers (and why researchers should ALWAYS check for them). *Practical Assessment, Research & Evaluation*, *9*(1), 1–8. https://doi.org/10.7275/qf69-7k43

Oxford English Dictionary. (2024). Credibility.

Pancer, E., McShane, L., & Noseworthy, T. J. (2017). Isolated environmental cues and product efficacy penalties: the Color green and eco-labels. *Journal of Business Ethics*, *143*(1), 159–177. https://doi.org/10.1007/s10551-015-2764-4

Panopoulos, A., Poulis, A., Theodoridis, P. K., & Kalampakas, A. (2022). Influencing Green Purchase Intention through Eco Labels and User-Generated Content. *Sustainability*, *15*(1), 764. https://doi.org/10.3390/su15010764

Parkinson, T. L. 1975. 'The Role of Seals and Certifications of Approval in Consumer Decision-Making', *Journal of Consumer Affairs*, 9(1), 1-14. Available from: doi: 10.1111/j.1745-6606.1975.tb00545.x

Ranasinghe, L., & Jayasooriya, V. (2021). Ecolabelling in textile industry: A review. *Resources, Environment and Sustainability*, *6*, 100037. https://doi.org/10.1016/j.resenv.2021.100037

Rashid, N. R. N. A. (2009). Awareness of eco-label in Malaysia's green marketing initiative. *International Journal of Business and Management*, *4*(8). https://doi.org/10.5539/ijbm.v4n8p132

Reis, B., Pereira, M., Azevedo, S. G., Jerónimo, N. A., & Miguel, R. (2018). Genderless clothing issues in fashion. In *CRC Press eBooks* (pp. 255–260). https://doi.org/10.1201/9781315100210-47

Rex, E., & Baumann, H. (2007). Beyond ecolabels: what green marketing can learn from conventional marketing. *Journal of Cleaner Production*, *15*(6), 567–576. https://doi.org/10.1016/j.jclepro.2006.05.013

Rubin, D. B. (1974). Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of educational Psychology*, 66(5), 688.

Roe, B., & Sheldon, I. (2007). Credence Good labeling: the efficiency and distributional implications of several policy approaches. *American Journal of Agricultural Economics*, *89*(4), 1020–1033. https://doi.org/10.1111/j.1467-8276.2007.01024.x

Rosendo Ríos, V. & Pérez del Campo, E. (2013). Business research methods: Theory and practice. Madrid: Esic Editorial.

Schena, R., Netti, G., & Russo, A. (2015). Consumers' Behavior toward Green Products: A Signalling Theory Approach. *International Journal of Business Administration*, *6*(6). https://doi.org/10.5430/ijba.v6n6p44

Schmider, E., Ziegler, M., Danay, E., Beyer, L., & Bühner, M. (2010). Is it really robust? *Methodology*, *6*(4), 147–151. https://doi.org/10.1027/1614-2241/a000016

Schumacher, I. (2010). Ecolabeling, consumers' preferences and taxation. *Ecological Economics*, *69*(11), 2202–2212. https://doi.org/10.1016/j.ecolecon.2010.06.005

Setiawan, B., & Yosephani, A. (2022). The linkage of greenwashing perception and consumers' green purchase intention. *Business and Entrepreneurial Review*, *22*(1), 85-96.

Shah, S. S. H., Aziz, J., Waris, S., Ejaz, W., Fatima, M., & Sherazi, S. K. (2012). The Impact of Brands on Consumer Purchase Intentions. *Asian Journal of Business Management*, *4*(2), 105–110. http://www.maxwellsci.com/print/ajbm/v4-105-110.pdf

Sharma, N. K., & Kushwaha, G. S. (2019). Eco-labels: A tool for green marketing or just a blind mirror for consumers. *Electronic Green Journal*, *1*(42). https://doi.org/10.5070/g314233710

Shingala, M. C., & Rajyaguru, A. (2015). Comparison of post hoc tests for unequal variance. *International Journal of New Technologies in Science and Engineering*, *2*(5), 22-33.

Sigurdsson, V., Larsen, N. M., Pálsdóttir, R. G., Folwarczny, M., Menon, R., & Fagerstrøm, A. (2022). Increasing the effectiveness of ecological food signaling: Comparing sustainability tags with eco-labels. *Journal of Business Research*, *139*, 1099–1110. https://doi.org/10.1016/j.jbusres.2021.10.052

Sinha, P., & Shah, R. (2010). Creating a global vision for sustainable textiles.

Sirieix, L., Delanchy, M., Remaud, H., Zepeda, L., & Gurviez, P. (2013). Consumers' perceptions of individual and combined sustainable food labels: a UK pilot investigation. *International Journal of Consumer Studies*, *37*(2), 143–151. https://doi.org/10.1111/j.1470-6431.2012.01109.x

Smith, S., & Paladino, A. (2010). Eating Clean and Green? Investigating Consumer Motivations towards the Purchase of Organic Food. *Australasian Marketing Journal (Amj)*, *18*(2), 93–104. https://doi.org/10.1016/j.ausmj.2010.01.001

Solomon, M. R. (2013). *Consumer Behavior: Buying, Having, and Being*. Harlow: Pearson.

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, *87*(3), 355-374. https://doi.org/10.2307/1882010

Steenkamp, J. E. (1990). Conceptual model of the quality perception process. *Journal of Business Research*, *21*(4), 309–333. https://doi.org/10.1016/0148-2963(90)90019-a

Suresh, K. (2011). An overview of randomization techniques: An unbiased assessment of outcome in clinical research. *J Hum Reprod Sci.*, 4(1), 8-11. doi: 10.4103/0974-1208.82352.

Szabo, S., & Webster, J. (2020). Perceived Greenwashing: The effects of green marketing on environmental and product perceptions. *Journal of Business Ethics*. https://doi.org/10.1007/s10551-020-04461-0

Szybillo, G. J., & Jacoby, J. (1974). Intrinsic versus extrinsic cues as determinants of perceived product quality. *Journal of Applied Psychology*, *59*(1), 74–78. https://doi.org/10.1037/h0035796

Tam, J. L. (2008). Brand familiarity: its effects on satisfaction evaluations. *Journal of Services Marketing*, *22*(1), 3–12. https://doi.org/10.1108/08876040810851914

Taufique, K. M. R., Vocino, A., & Polonsky, M. J. (2016). The influence of eco-label knowledge and trust on pro-environmental consumer behaviour in an emerging market. *Journal of Strategic Marketing*, *25*(7), 511–529. https://doi.org/10.1080/0965254x.2016.1240219

Teisl, M. F. (2003). What we may have is a failure to communicate: Labeling environmentally certified forest products. *Forest Science*, *49*(5), 668–680. https://doi.org/10.1093/forestscience/49.5.668

Testa, F., Iraldo, F., Vaccari, A., & Ferrari, E. (2013). Why Eco-labels can be Effective Marketing Tools: Evidence from a Study on Italian Consumers. *Business Strategy and the Environment*, *24*(4), 252–265. https://doi.org/10.1002/bse.1821

Tewari, A., Mathur, S., Srivastava, S., & Gangwar, D. (2022). Examining the role of receptivity to green communication, altruism and openness to change on young consumers' intention to purchase green apparel: A multi-analytical approach. *Journal of Retailing and Consumer Services*, *66*, 102938. https://doi.org/10.1016/j.jretconser.2022.102938

Tewksbury, R. (2009). Qualitative versus quantitative methods. Understanding why qualitative methods are superior for criminology and criminal justice. *Journal of Theoretical and Philosophical Criminology*, *1*(1), 38-58. Retrieved from: http://jtpcrim.org/January_Articles/Qualitative_Vs_Quantitative_Richard_Tewksbury.pdf.

Thøgersen, J. (2000). Psychological determinants of paying attention to Eco-Labels in purchase decisions: model development and multinational validation. *Journal of Consumer Policy*, *23*(3), 285–313. https://doi.org/10.1023/a:1007122319675

Thøgersen, J. (2002), "Promoting Green Consumer Behavior with EcoLabels," in New Tools for Environmental Protection: Education Information and Voluntary Measures, Thomas Dietz and Paul C. Stern, eds., Washington, DC: National Academy Press, 83–104.

Thøgersen, J., Haugaard, P., & Olesen, A. (2010). Consumer responses to ecolabels. *European Journal of Marketing*, *44*(11/12), 1787–1810. https://doi.org/10.1108/03090561011079882

Tsiotsou, R. (2005). Perceived quality levels and their relation to involvement, satisfaction, and purchase intentions. *Marketing Bulletin*, *16*(4), 1-10.

Tsiotsou, R. H. (2006). The role of perceived product quality and overall satisfaction on purchase intentions. *International Journal of Consumer Studies*, *30*(2), 207–217. https://doi.org/10.1111/j.1470-6431.2005.00477.x

Vantamay, S. (2008). Understanding of perceived product quality: reviews and recommendations. *BU Academic Review*, *6*(1), 110–117.

Wasaya, A., Saleem, M. A., Ahmad, J., Nazam, M., Khan, M., & Ishfaq, M. (2021). Impact of green trust and green perceived quality on green purchase intentions: a moderation study. *Environment, Development and Sustainability*, *23*(9), 13418–13435. https://doi.org/10.1007/s10668-020-01219-6

Willie, M. M. (2024). Population and target population in research methodology. *Golden Ratio of Social Science and Education*, *4*(1), 75–79. https://doi.org/10.52970/grsse.v4i1.405

Wojnarowska, M., Sołtysik, M., & Prusak, A. (2021). Impact of eco-labelling on the implementation of sustainable production and consumption. *Environmental Impact Assessment Review*, *86*, 106505. https://doi.org/10.1016/j.eiar.2020.106505

Yau, Y. (2012). Eco-labels and willingness-to-pay: a Hong Kong study. *Smart and Sustainable Built Environment*, *1*(3), 277–290. https://doi.org/10.1108/20466091211287146

Yilmaz, Y., Üngüren, E., & Kaçmaz, Y. Y. (2019). Determination of Managers' Attitudes Towards Eco-Labeling Applied in the Context of Sustainable Tourism and Evaluation of the Effects of Eco-Labeling on Accommodation Enterprises. *Sustainability*, *11*(18), 5069. https://doi.org/10.3390/su11185069

Yokessa, M.¯., & Marette, S. (2019). A Review of Eco-labels and their Economic Impact. *International Review of Environmental and Resource Economics*, *13*(1–2), 119–163. https://doi.org/10.1561/101.00000107

Zhao, J., Butt, R. S., Murad, M., Mirza, F., & Al-Faryan, M. a. S. (2022). Untying the influence of advertisements on consumers buying behavior and brand loyalty through brand awareness: the moderating role of perceived quality. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.803348

Zeithaml, V. A. (1988). Consumer Perceptions of Price, Quality, and Value: A Means-End Model and Synthesis of evidence. *Journal of Marketing*, *52*(3), 2. https://doi.org/10.2307/1251446

Zellner, M., Abbas, A. E., Budescu, D. V., & Galstyan, A. (2021). A survey of human judgement and quantitative forecasting methods. *Royal Society Open Science*, *8*(2). https://doi.org/10.1098/rsos.201187

Zhang, L., Li, D., Cao, C., & Huang, S. (2018). The influence of greenwashing perception on green purchasing intentions: The mediating role of green word-of-mouth and moderating role of green concern. *Journal of Cleaner Production*, *187*, 740–750. https://doi.org/10.1016/j.jclepro.2018.03.20

Ziyeh, P., & Cinelli, M. (2023). A framework to navigate Eco-Labels in the textile and clothing industry. *Sustainability*, *15*(19), 14170. https://doi.org/10.3390/su151914170

7 APPENDICES

AI statement University of Twente

During the preparation of this work, I used ChatGPT 4.0 to improve the academic quality of my writing (e.g., asking general questions related to layout, APA style, grammar etc.), provide support for analysis-related (RStudio scripts and SPSS steps) questions, and accurately interpret my results. After using this tool/service, I thoroughly reviewed and edited the content as needed, taking full responsibility for the final outcome.

Appendix A An Overview sustainability labels in fashion

Overview of popular sustainability labels in the fashion industry

Name of the standard	Logo	Topics covered	Scope	Adoption rate
Oeko-Tex	OEKO-TEX® CONFIDENCE IN TEXTILES MADE IN GREEN	Health and safety	Textile products at all stages of production	~9.500 companies
Global Organic Textile Standard (GOTS)	GLOBAL ORGANIC TEXTILE STANDARD · GOTS ·	Environmental and social sustainability	Textile products	~3.085 companies
Fair Wear Foundation	FAIR WEAR FOUNDATION	Social sustainability	European garment companies	~80 companies
FairTrade	FAIRTRADE TEXTILE PRODUCTION	Social sustainability	Textile products	~35 companies

Note. By Morris et al. (2020)

Appendix B Examples of non-certified eco-labels

Overview of examples of non-certified eco-labels

Note. By (Mexia, 2022)

Appendix C Stimulus material

1) *T-shirt stimuli (in the order: non-certified eco-label, certified eco-label, control label)*

2) *Blazer stimuli (in the order: non-certified eco-label, certified eco-label, control label)*


FAIRTRADE
COTTON

Appendix D Pre-test lay-out and results

Lay out

Thank you for participating in this questionnaire!

In this questionnaire, you will be presented with questions and statements about eco-labels in fashion.

*The questionnaire takes approximately **4-5 minutes**. Your answers will be handled anonymously and confidentially. Your participation is voluntary, so if you no longer wish to participate, you can withdraw from the pre-test study at any time.*

For questions or recommendations, please feel free to contact me via e-mail: d.e.telintelo@student.utwente.nl!

By clicking on the proceed button, you agree to what is stated above.

---

1. ***Gender***

What is your gender?

- o Female
- o Male
- o Non-binary
- o Prefer not to say

---

2. ***Age***

What is your age?

---

3. ***Educational Level (based on the Dutch education system)***

What is you highest achieved level of education?

- o Elementary school
- o Some high school
- o High school
- o Trade or vocational school
- o Post-secondary certificate or diploma
- o Bachelor's degree
- o Master's degree
- o Professional or doctorate

Matthew, I., Walton, J. N., Dumaresq, C., & Sudmant, W. (2006). The burden of debt for Canadian dental students: part 3. Student indebtedness, sources of funding and the influence of socioeconomic status on debt. *Journal of the Canadian Dental Association*, *72*(9), 819. https://www.cda-adc.ca/jcda/vol-72/issue-9/819.pdf

4. Shopping behavior

How often do you engage in shopping for clothing items?

1. Rarely (Once every few months)
2. Occasionally (Once a month)
3. Sometimes (2-3 times a month)
4. Often (Once a week)
5. Very often (2-3 times a week)
6. Always (Daily)

Mumel, D., Završnik, B., & Prodnik, J. (2006). Shopping patterns of older consumers in Slovenian clothes market. *Fibres & Textiles in Eastern Europe*. http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.baztech-82c8b4eb-ebd7-495f-9259-e6ec503a961f

5. Shopping environment

When you shop for clothing items, which method do you prefer?

1. Mostly offline (in physical stores)
2. Equally offline and online
3. Mostly online
4. Other

---

6. Familiarity of certified eco-labels

In the next section you will be presented with four eco-labels, after which you are asked to fill in an indication on the extent to which you are familiar with each eco-label. Please fill in the questions as carefully as possible.

Questions/statements eco-labels (example):

1. Please indicate below the extent to which the ecolabel is familiar to you.

Not familiar at all	*Unfamiliar*	*Not really familiar*	*Neither familiar*	*Familiar*	*Reasonably familiar*	*Very familiar*

			nor unfamiliar			
				x		
			x			
		x				
			x			

---

7. *Familiarity of non-certified eco-labels*

In the next section you will again be presented with four eco-labels, after which you are asked to fill in an indication on the extent to which you are familiar with each eco-label. Please fill in the questions as carefully as possible.

Questions/statements eco-labels (example):

2. Please indicate below the extent to which the ecolabel is familiar to you.

Not familiar at all	*Unfamiliar*	*Not really familiar*	*Neither familiar nor unfamiliar*	*Familiar*	*Reasonably familiar*	*Very familiar*
				x		

x

x

x

Tam, J. L. (2008). Brand familiarity: its effects on satisfaction evaluations. *Journal of Services Marketing*, *22*(1), 3–12. https://doi.org/10.1108/08876040810851914

Random control question

Please answer the following questions as accurately as possible.

- *How familiar are you with the concept of eco-labels in fashion?*

1. *Not familiar at all*
2. *Moderately unfamiliar*
3. *Somewhat familiar*
4. *Neither familiar nor unfamiliar*
5. *Somewhat familiar*
6. *Moderately familiar*
7. *Very familiar*

End of survey

Overview results pre-test

1. Demographics

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	12	26.7	26.7	26.7
	Female	33	73.3	73.3	100.0
	Total	45	100.0	100.0	

What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 28 years old	36	80.0	80.0	80.0
	44 - 58 years old	8	17.8	17.8	97.8
	59 - 77 years old	1	2.2	2.2	100.0
	Total	45	100.0	100.0	

What is your highest achieved level of education?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Some High School	1	2.2	2.2	2.2
	High School	13	28.9	28.9	31.1
	Bachelor's degree	21	46.7	46.7	77.8
	Master's degree	10	22.2	22.2	100.0
	Total	45	100.0	100.0	

How often do you engage in shopping for clothing items?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rarely (Once every few months)	15	33.3	33.3	33.3
	Occasionally (Once a month)	12	26.7	26.7	60.0
	Sometimes (2-3 times a month)	13	28.9	28.9	88.9
	Often (Once a week)	3	6.7	6.7	95.6
	Very often (2-3 times a week)	2	4.4	4.4	100.0
	Total	45	100.0	100.0	

When you shop for clothing items, which method do you prefer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mostly offline (in physical stores)	17	37.8	37.8	37.8
	Equally offline and online	16	35.6	35.6	73.3
	Mostly online	12	26.7	26.7	100.0
	Total	45	100.0	100.0	

2. Eco-label familiarity

Certified eco-labels

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
GOTS	45	1	7	2.29	1.961
Fairtrade	45	1	7	5.49	1.687
OEKOTEX	45	1	7	2.40	2.016
EUecolabel	45	1	6	2.33	1.581
Valid N (listwise)	45				

Non-certified eco-labels

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Recycled	45	1	7	2.67	1.706
Ecofriendly	45	1	6	2.44	1.589
Ecolabel	45	1	6	3.04	1.833
Organic	45	1	6	2.11	1.511
Valid N (listwise)	45				

General eco-label familiarity

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
How familiar are you in general with the concept of eco-labels in fashion?	45	1	6	3.18	1.556
Valid N (listwise)	45				

- Paired t-test mean difference certified eco-labels and non-certified eco-labels

Paired Samples Test

		Paired Differences							Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	One-Sided p	Two-Sided p
Pair 1	Certified_ecolabels - Noncertified_ecolabels	.56111	1.34223	.20009	.15786	.96436	2.804	44	.004	.007

- Repeated measures ANOVA (certified eco-labels)

Tests of Within-Subjects Effects

Measure: Familiarity

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Certifiedecolabels	Sphericity Assumed	334.772	3	111.591	55.589	<.001
	Greenhouse-Geisser	334.772	2.413	138.745	55.589	<.001
	Huynh-Feldt	334.772	2.563	130.629	55.589	<.001
	Lower-bound	334.772	1.000	334.772	55.589	<.001
Error(Certifiedecolabels)	Sphericity Assumed	264.978	132	2.007		
	Greenhouse-Geisser	264.978	106.165	2.496		
	Huynh-Feldt	264.978	112.762	2.350		
	Lower-bound	264.978	44.000	6.022		

- Repeated measures ANOVA (non-certified eco-labels)

Tests of Within-Subjects Effects

Measure: Familiarity

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Noncertifiedecolabels	Sphericity Assumed	20.733	3	6.911	3.781	.012
	Greenhouse-Geisser	20.733	2.772	7.479	3.781	.015
	Huynh-Feldt	20.733	2.977	6.964	3.781	.012
	Lower-bound	20.733	1.000	20.733	3.781	.058
Error(Noncertifiedecolabels)	Sphericity Assumed	241.267	132	1.828		
	Greenhouse-Geisser	241.267	121.978	1.978		
	Huynh-Feldt	241.267	131.004	1.842		
	Lower-bound	241.267	44.000	5.483		

- Pair wise comparisons for the certified eco-labels

Within-Subjects Factors

Measure: Familiarity

Certifiedecolabels	Dependent Variable
1	Familiarity_GOTS_label
2	Familiarity_Fairtrade_label
3	Familiarity_OEKOTEX_label
4	Familiarity_EUecolabel_label

Pairwise Comparisons

Measure: Familiarity

(I) Certifiedecolabels	(J) Certifiedecolabels	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	-3.200*	.342	<.001	-4.144	-2.256
	3	-.111	.227	1.000	-.740	.517
	4	-.044	.256	1.000	-.752	.663
2	1	3.200*	.342	<.001	2.256	4.144
	3	3.089*	.364	<.001	2.085	4.093
	4	3.156*	.295	<.001	2.341	3.970
3	1	.111	.227	1.000	-.517	.740
	2	-3.089*	.364	<.001	-4.093	-2.085
	4	.067	.287	1.000	-.726	.859
4	1	.044	.256	1.000	-.663	.752
	2	-3.156*	.295	<.001	-3.970	-2.341
	3	-.067	.287	1.000	-.859	.726

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

- Pair wise comparisons for the non-certified eco-labels

Within-Subjects Factors

Measure: Familiarity

Noncertifiedecolabels	Dependent Variable
1	Familiarity_Recycled_label
2	Familiarity_Ecofriendly_label
3	Familiarity_Eco_label
4	Familiarity_Organic_label

Pairwise Comparisons

Measure: Familiarity

(I) Noncertifiedecolabels	(J) Noncertifiedecolabels	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.222	.280	1.000	-.553	.997
	3	-.378	.283	1.000	-1.160	.404
	4	.556	.287	.356	-.237	1.349
2	1	-.222	.280	1.000	-.997	.553
	3	-.600	.304	.328	-1.439	.239
	4	.333	.236	.986	-.318	.985
3	1	.378	.283	1.000	-.404	1.160
	2	.600	.304	.328	-.239	1.439
	4	.933*	.314	.028	.067	1.800
4	1	-.556	.287	.356	-1.349	.237
	2	-.333	.236	.986	-.985	.318
	3	-.933*	.314	.028	-1.800	-.067

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix E Tests of Within-Subjects Contrsst for ProductType and Labeltype

Tests of Within-Subjects Contrasts

Measure: PerceivedQuality

Source	ProductType	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
ProductType	Linear	.147	1	.147	.520	.472	.005
ProductType * LabelType	Linear	.018	2	.009	.032	.968	.001
Error(ProductType)	Linear	30.559	108	.283			

Appendix F Questionnaire Lay-out

1)

Thank you for participating in this questionnaire!

The questionnaire aims to gather your perceptions of sustainable labels in the fashion industry to aid in my Master's Thesis research.

In this questionnaire, you will first be presented with a shopping case, after which you are asked to answer a few statements.

The questionnaire takes approximately 3-5 minutes. Your answers will be handled anonymously and confidentially. Your participation is voluntary, so you can withdraw from the study at any time.

For questions or recommendations, please feel free to contact me via e-mail: d.e.telintelo@student.utwente.nl!

By clicking on the proceed button, you agree to what is stated above.

2)

Please indicate to what extent you agree with the following statement.

"I am familiar with the term "sustainable fashion".

- Strongly disagree
- Disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Agree
- Strongly agree

3)

Please read the following information carefully:

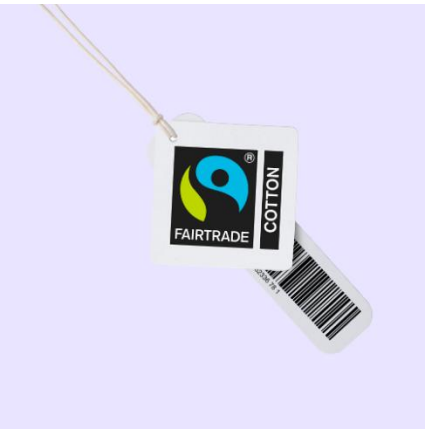
"Sustainable fashion focuses on producing clothing without negative impact on the environment or individuals. This involves using eco-friendly materials, ethical production practices, responsible distribution channels, reusing old garments and applying sustainable production technologies."

4)

I read the information about sustainable fashion.

- Yes

5)



Please indicate to what extent you agree with the following statements.

Please indicatie to what extent you agree with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I can trust what this sign says.	○	○	○	○	○	○	○
This sign comes from a recognized organization or experts.	○	○	○	○	○	○	○
This sign is honest.	○	○	○	○	○	○	○
The organization that issued this sign has good intentions.	○	○	○	○	○	○	○
The organizations conducted serious tests before issuing this sign.	○	○	○	○	○	○	○
I trust this sign.	○	○	○	○	○	○	○

6)

Imagine that you are browsing through an online clothing store in search of a new white t-shirt. You come across a design that catches your eye—it's a white t-shirt by a brand for both men and women.

Intrigued, you decide to take a closer look. As you hover over the product image, you notice the label attached to the t-shirt.

Give your opinion on the following statements about the T-shirt.

	Very bad	Bad	Somewhat bad	Neutral	Somewhat good	Good	Very good
The workmanship of this product is likely to be	○	○	○	○	○	○	○
The quality of this product is likely to be	○	○	○	○	○	○	○
The durability of this product is likely to be	○	○	○	○	○	○	○

7)

Imagine that you are browsing through an online clothing store in search of a new black blazer. You come across a design that catches your eye—it's a black blazer by a brand for both men and women.

Intrigued, you decide to take a closer look. As you hover over the product image, you notice the label attached to the blazer.

Give your opinion on the following statements about the T-shirt.

	Very bad	Bad	Somewhat bad	Neutral	Somewhat good	Good	Very good
The workmanship of this product is likely to be	○	○	○	○	○	○	○
The quality of this product is likely to be	○	○	○	○	○	○	○
The durability of this product is likely to be	○	○	○	○	○	○	○

8)

Demographics

1. What is your age?

2. What is your gender?
   - Male
   - Female
   - Non-binary/third gender
   - Prefer not to say

3. What is your nationality?

4. What is your highest level of achieved education?
   - Primary education
   - Lower secondary education
   - Upper secondary education
   - Bachelor degree
   - Master degree
   - PhD

5. Which label did you encounter during this questionnaire?
   - 

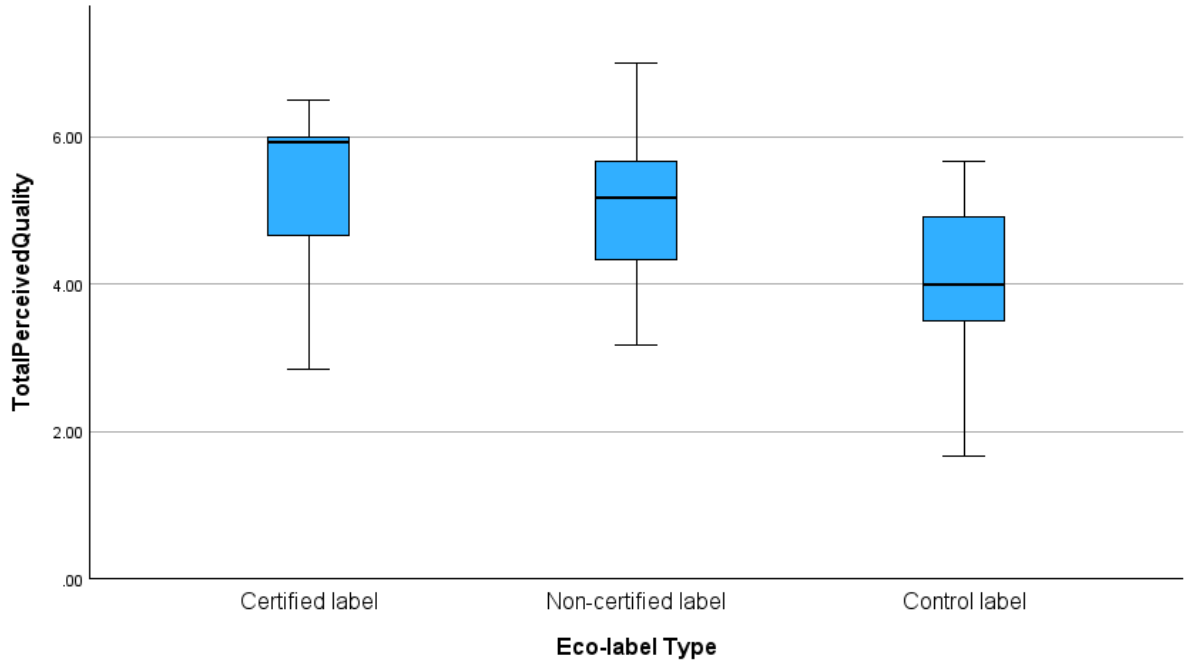
   - 

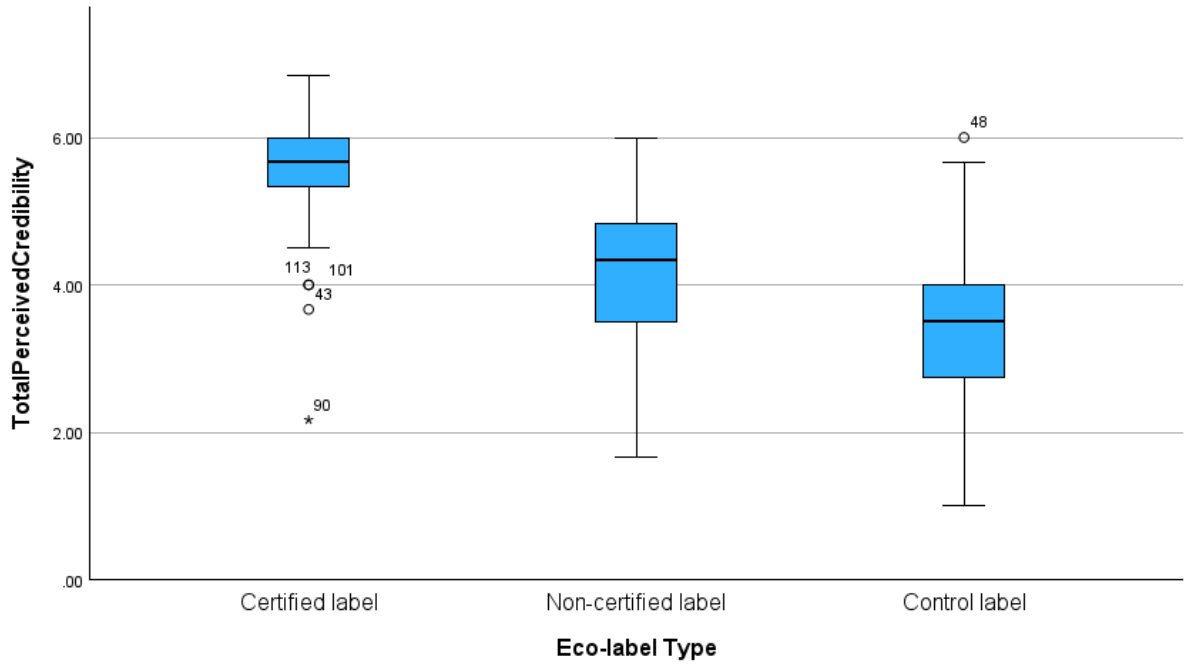
- 
- Not sure / do not remember

12)

Thank you for participating!

Appendix G Detection of outliers





Appendix H Cronbach's alpha

- TotalPerceivedCredibility_certified

Reliability Statistics

Cronbach's Alpha	N of Items
.729	6

- TotalPerceivedCredibility_noncertified

Reliability Statistics

Cronbach's Alpha	N of Items
.919	6

- TotalPerceivedCredibility_control

Reliability Statistics

Cronbach's Alpha	N of Items
.891	6

- TotalPerceivedQuality_certified

Reliability Statistics

Cronbach's Alpha	N of Items
.909	6

- TotalPerceivedQuality_noncertified

Reliability Statistics

Cronbach's Alpha	N of Items
.865	6

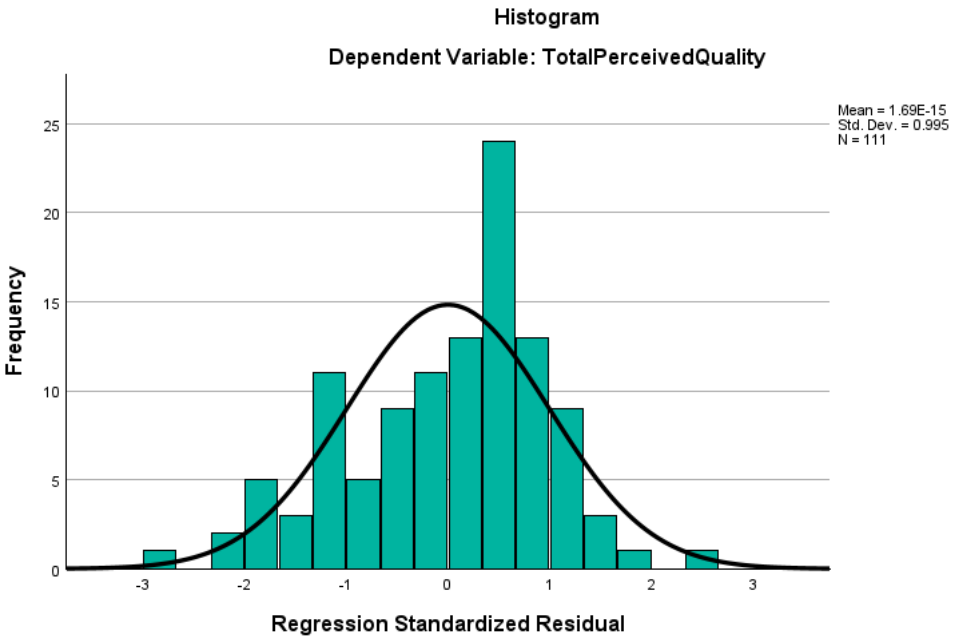
- TotalPerceivedQuality_control

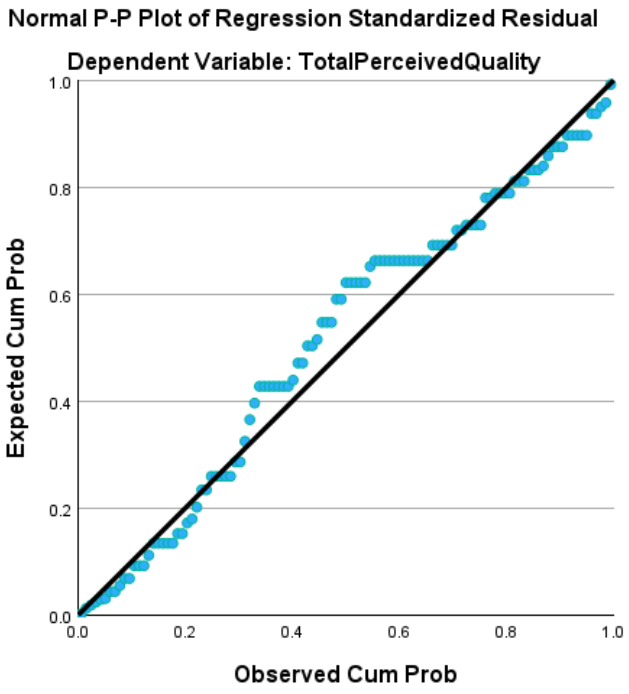
Reliability Statistics

Cronbach's Alpha	N of Items
.908	6

Appendix I Assumptions ANOVA

1) Dependent variable: Perceived Quality





- *Normality:*

Tests of Normality

	Eco-label type	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
TotalPerceivedQuality	Certified eco-label	.272	38	<.001	.854	38	<.001
	Non-certified	.096	39	.200*	.983	39	.815
	Control label	.148	34	.058	.955	34	.174

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

- *Homogeneity of variances:*

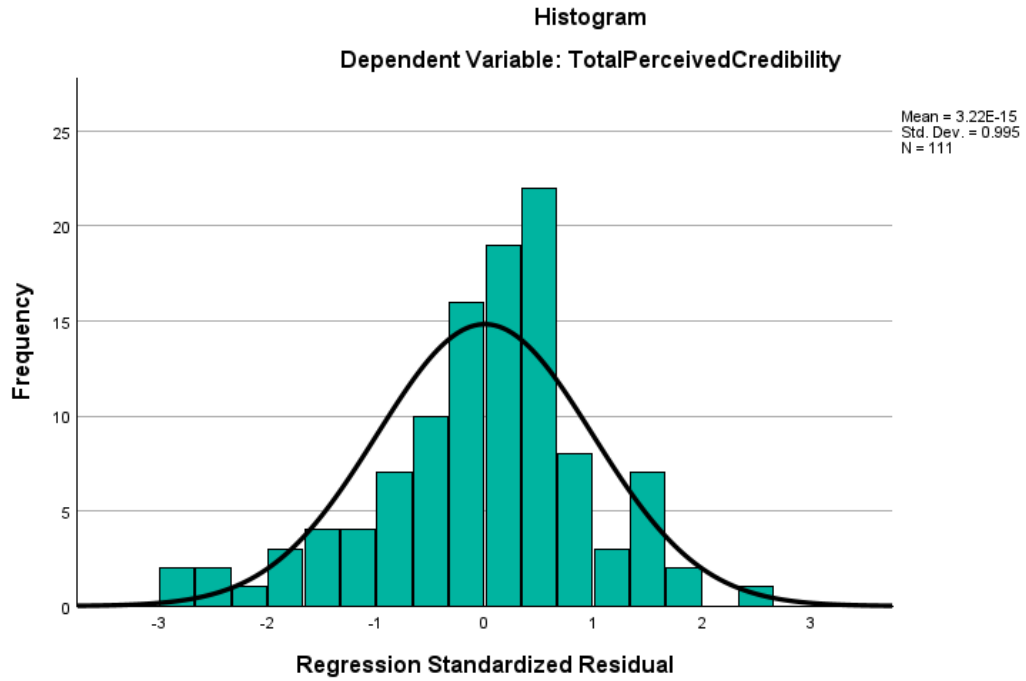
Levene's Test of Equality of Error Variances[a,b]

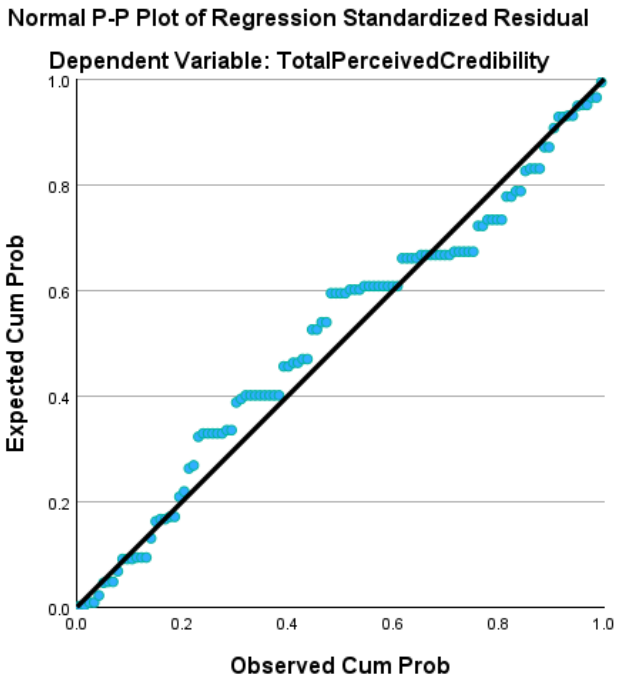
		Levene Statistic	df1	df2	Sig.
TotalPerceivedQuality	Based on Mean	1.241	2	108	.293

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: TotalPerceivedQuality
b. Design: Intercept + EcoLabelType

2) Dependent variable: Perceived Credibility





- *Normality:*

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Eco-label type	Statistic	df	Sig.	Statistic	df	Sig.
TotalPerceivedCredibility	Certified eco-label	.165	38	.011	.960	38	.193
	Non-certified	.128	39	.106	.961	39	.197
	Control label	.108	34	.200*	.974	34	.566

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

- *Homogeneity of variances:*

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
TotalPerceivedCredibility	Based on Mean	8.577	2	108	<.001

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: TotalPerceivedCredibility
b. Design: Intercept + EcoLabelType

Appendix J Results for Welch's ANOVA and Post-Hoc tests

- *Welch's ANOVA*

Robust Tests of Equality of Means

TotalPerceivedCredibility

	Statistic[a]	df1	df2	Sig.
Welch	73.984	2	60.752	<.001

a. Asymptotically F distributed.

- *Post Hoc tests:*

Multiple Comparisons

Dependent Variable: TotalPerceivedCredibility

	(I) Eco-label type	(J) Eco-label type	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Dunnett T3	Certified eco-label	Non-certified	1.38855*	.19615	<.001	.9057	1.8714
		Control label	2.29076*	.20806	<.001	1.7756	2.8060
	Non-certified	Certified eco-label	-1.38855*	.19615	<.001	-1.8714	-.9057
		Control label	.90221*	.26119	.003	.2638	1.5406
	Control label	Certified eco-label	-2.29076*	.20806	<.001	-2.8060	-1.7756
		Non-certified	-.90221*	.26119	.003	-1.5406	-.2638
Games-Howell	Certified eco-label	Non-certified	1.38855*	.19615	<.001	.9157	1.8614
		Control label	2.29076*	.20806	<.001	1.7865	2.7950
	Non-certified	Certified eco-label	-1.38855*	.19615	<.001	-1.8614	-.9157
		Control label	.90221*	.26119	.003	.2767	1.5277
	Control label	Certified eco-label	-2.29076*	.20806	<.001	-2.7950	-1.7865
		Non-certified	-.90221*	.26119	.003	-1.5277	-.2767

*. The mean difference is significant at the 0.05 level.

Appendix K One-way ANOVA results

- *One-way ANOVA results perceived quality per label type*

```
             Df Sum Sq Mean Sq F value   Pr(>F)
LabelType   2  40.41  20.205   26.73 3.71e-10 ***
Residuals   108  81.63   0.756
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

- *ANOVA effect sizes for TotalPerceivedQuality*

ANOVA Effect Sizes[a]

			95% Confidence Interval	
		Point Estimate	Lower	Upper
TotalPerceivedQuality	Eta-squared	.331	.185	.445
	Epsilon-squared	.319	.170	.434
	Omega-squared Fixed-effect	.317	.169	.432
	Omega-squared Random-effect	.188	.092	.276

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

- *Post-hoc analysis for TotalPerceivedQuality*

Multiple Comparisons
Dependent Variable: TotalPerceivedQuality

						95% Confidence Interval	
	(I) Label type	(J) Label type	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Tukey HSD	Certified eco-label	Non-certified	.51001*	.19817	.030	.0391	.9810
		Control label	1.48349*	.20524	<.001	.9957	1.9712
	Non-certified	Certified eco-label	-.51001*	.19817	.030	-.9810	-.0391
		Control label	.97348*	.20399	<.001	.4887	1.4583
	Control label	Certified eco-label	-1.48349*	.20524	<.001	-1.9712	-.9957
		Non-certified	-.97348*	.20399	<.001	-1.4583	-.4887
Bonferroni	Certified eco-label	Non-certified	.51001*	.19817	.034	.0281	.9919
		Control label	1.48349*	.20524	<.001	.9844	1.9826
	Non-certified	Certified eco-label	-.51001*	.19817	.034	-.9919	-.0281
		Control label	.97348*	.20399	<.001	.4774	1.4696
	Control label	Certified eco-label	-1.48349*	.20524	<.001	-1.9826	-.9844
		Non-certified	-.97348*	.20399	<.001	-1.4696	-.4774

*. The mean difference is significant at the 0.05 level.

- *One-way ANOVA results perceived quality eco-label vs. control label*

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
EcoLabelCombined	1	35.40	35.40	44.54	1.08e-09 ***
Residuals	109	86.64	0.79		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

- *One-way ANOVA results perceived credibility per label type*

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
LabelType	2	96.55	48.27	53.48	<2e-16 ***
Residuals	108	97.48	0.90		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

- *ANOVA effect sizes for TotalPerceivedCredibility*

ANOVA Effect Sizes[a]

			95% Confidence Interval	
		Point Estimate	Lower	Upper
TotalPerceivedCredibility	Eta-squared	.498	.358	.592
	Epsilon-squared	.488	.346	.584
	Omega-squared Fixed-effect	.486	.344	.582
	Omega-squared Random-effect	.321	.208	.410

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

- *Post-hoc analysis for TotalPerceivedCredibility*

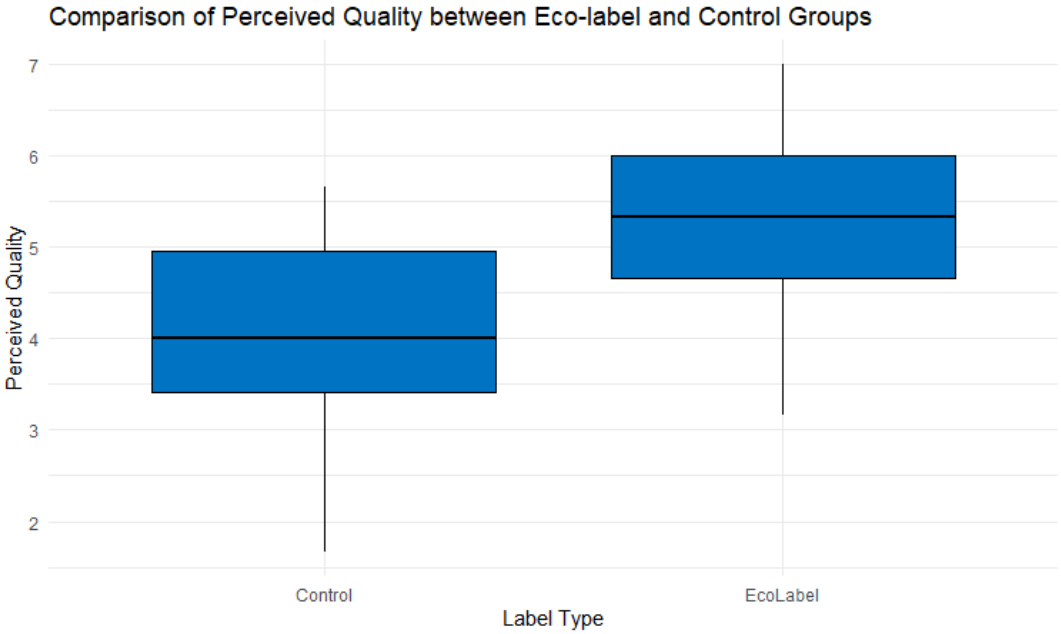
Multiple Comparisons
Dependent Variable: TotalPerceivedCredibility

						95% Confidence Interval	
	(I) Label type	(J) Label type	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Tukey HSD	Certified eco-label	Non-certified	1.38855*	.21655	<.001	.8739	1.9032
		Control label	2.29076*	.22427	<.001	1.7578	2.8237
	Non-certified	Certified eco-label	-1.38855*	.21655	<.001	-1.9032	-.8739

		Control label	.90221*	.22291	<.001	.3725	1.4319
	Control label	Certified eco-label	-2.29076*	.22427	<.001	-2.8237	-1.7578
		Non-certified	-.90221*	.22291	<.001	-1.4319	-.3725
Bonferroni	Certified eco-label	Non-certified	1.38855*	.21655	<.001	.8619	1.9152
		Control label	2.29076*	.22427	<.001	1.7454	2.8362
	Non-certified	Certified eco-label	-1.38855*	.21655	<.001	-1.9152	-.8619
		Control label	.90221*	.22291	<.001	.3601	1.4443
	Control label	Certified eco-label	-2.29076*	.22427	<.001	-2.8362	-1.7454
		Non-certified	-.90221*	.22291	<.001	-1.4443	-.3601

*. The mean difference is significant at the 0.05 level.

- *Boxplot 'Comparison of perceived quality between Eco-label and Control Groups'*



Appendix L Results mediation analyses by PROCESS macro in SPSS

Certified eco-label compared to non-certified eco-label (1 = certified eco-label, 0 = non-certified eco-label and control label)

Run MATRIX procedure:

********** PROCESS Procedure for SPSS Version 4.2 **********

Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2022). www.guilford.com/p/hayes3

****

Model : 4

Y : PerQua

X : EcoType1

M : PerCre

Sample

Size: 111

****

OUTCOME VARIABLE:

PerCre

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6492	.4214	1.0299	79.3853	1.0000	109.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	3.8447	.1188	32.3688	.0000	3.6093	4.0802
EcoType1	1.8088	.2030	8.9098	.0000	1.4064	2.2111

****

OUTCOME VARIABLE:

PerQua

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6277	.3941	.6847	35.1175	2.0000	108.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	2.7830	.3155	8.8208	.0000	2.1576	3.4084
EcoType1	.1116	.2176	.5129	.6091	-.3197	.5430
PerCre	.4709	.0781	6.0299	.0000	.3161	.6257

************************** TOTAL EFFECT MODEL
****

OUTCOME VARIABLE:

PerQua

Model Summary

R	R-sq	MSE	F	df1	df2	p
.4360	.1901	.9069	25.5779	1.0000	109.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	4.5936	.1115	41.2140	.0000	4.3727	4.8145
EcoType1	.9634	.1905	5.0575	.0000	.5859	1.3410

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y
****

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
.9634	.1905	5.0575	.0000	.5859	1.3410

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.1116	.2176	.5129	.6091	-.3197	.5430

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
PerCre	.8518	.1426	.5897	1.1446

********** ANALYSIS NOTES AND ERRORS **********

Level of confidence for all confidence intervals in output:

95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

------ END MATRIX -----

Non-certified eco-label compared to non-certified eco-label (1 = non-certified eco-label, 0 = certified eco-label and control label)

Run MATRIX procedure:

********** PROCESS Procedure for SPSS Version 4.2 **********

Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2022). www.guilford.com/p/hayes3

****

Model : 4

Y : PerQua

X : EcoType2

M : PerCre

Sample

Size: 111

****

OUTCOME VARIABLE:

PerCre

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1108	.0123	1.7582	1.3543	1.0000	109.0000	.2471

Model

	coeff	se	t	p	LLCI	ULCI
constant	4.5718	.1563	29.2562	.0000	4.2620	4.8815
EcoType2	-.3068	.2636	-1.1638	.2471	-.8293	.2157

****

OUTCOME VARIABLE:

PerQua

Model Summary

R	R-sq	MSE	F	df1	df2	p
.6460	.4173	.6585	38.6672	2.0000	108.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI

constant	2.5211	.2845	8.8603	.0000	1.9571	3.0851
EcoType2	.3472	.1623	2.1390	.0347	.0255	.6690
PerCre	.5108	.0586	8.7143	.0000	.3946	.6270

********** TOTAL EFFECT MODEL **********

OUTCOME VARIABLE:

PerQua

Model Summary

R	R-sq	MSE	F	df1	df2	p
.0867	.0075	1.1112	.8264	1.0000	109.0000	.3653

Model

	coeff	se	t	p	LLCI	ULCI
constant	4.8565	.1242	39.0916	.0000	4.6103	5.1027
EcoType2	.1905	.2096	.9091	.3653	-.2249	.6059

********** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **********

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
.1905	.2096	.9091	.3653	-.2249	.6059

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.3472	.1623	2.1390	.0347	.0255	.6690

Indirect effect(s) of X on Y:

```
          Effect     BootSE   BootLLCI   BootULCI
PerCre     -.1567      .1274     -.4070      .0903

************************ ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

------ END MATRIX -----
```