Perceptions on Plastic-Free Sustainable Clothing

Strengthening Environmental Self-Identity and Information Provision do not
Change Perceptions

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Abstract

Over the past decades, the exponential increase in global plastic production has led to the proliferation of plastic pollution, particularly microplastics (MPs), which pose significant threats to ecosystems and human health. Among MPs, microplastic fibers (MFs) from textiles are the most abundant form found in the environment. The fashion industry, with its reliance on synthetic fabrics, contributes significantly to the release of MFs through laundering processes. This paper aims to address microplastic pollution by changing people's perceptions of sustainable plastic-free clothing. This study followed a theory-grounded approach to design an online experiment that examines the relationship between environmental self-identity (ESI) and the effectiveness of information provision in promoting sustainable behavior. The results of this research did not yield significant findings, indicating that enhancing ESI does not improve the impact of information provision.

Keywords: Microplastic pollution, Fashion industry, Information provision, Environmental self-identity

Content

1. Introduction

Plastics have become an integral part of contemporary society and one of the most common materials in the global economy. Despite their ubiquitous presence in our daily lives, they often go unnoticed (Kontrick, 2018). Moreover, the long-term consequences and implications of such intensive plastic use remain largely unknown (Carney-Almroth et al., 2018).
Global plastic production has increased exponentially since the 1950s, from 2 million to 390.7 million tons in 2021. The ever-growing demand for plastics is driven by their low cost, lightweight, versatility, and resistance; and is set to continue as the dependency on plastic grows (Ritchie & Roser, 2018), utilizing finite resources and contributing to greenhouse gas emissions. (Hamilton & Feit, 2019; PlasticsEurope, 2022).

Despite the revolutionary progress that plastics have brought to a multitude of fields, their widespread distribution due to mismanagement has increased the likelihood of plastics entering and harming the environment (Shen et al., 2020). Over the past decade, the emergency crisis of plastic pollution in the environment, specifically microplastics (MPs), has become an increasing concern among the public and scientists because of their persistence and non-biodegradability (Hu et al., 2019a; Thompson et al., 2004). MPs are plastic particles measuring less than 5 mm in their smallest dimension (Alimi et al., 2018) and are further classified into two groups based on their origin. Primary MPs are intentionally manufactured for direct use or as precursors to other goods, such as personal care products or plastic pellets (commonly known as nurdles) used in toys and clothing (De Falco et al., 2020). Secondary microplastics are particles that result from the fragmentation and degradation (breakdown) of larger plastic items as a result of mechanical weathering processes or abrasion, hydrolysis, photodegradation, and biodegradation after entering the natural environment (Arthur et al., 2009). This process creates a continuous source of MPs that can remain in the environment for centuries (Auta et al., 2017).

The proliferation of MP is a significant contributor to environmental pollution and is intricately connected with climate change, posing a wide array of serious threats to our planet and its inhabitants (Ford et al., 2022). Apart from the hazardous toxins and gasses emitted during the production and transport of plastics; impose the usage and disposal of plastics grave risks to nature (Hu et al., 2019b; Shen et al., 2019). Plastic debris can disrupt entire ecosystems through various means, including wildlife entanglement, ingestion, or interaction, resulting in catastrophic and far-reaching effects that contribute to a loss of biodiversity (Deudero & Alomar, 2015). Subsequent impacts could reverberate up the food chain through cascading

effects and potentially affect human health through increased exposure to harmful chemicals (Rist et al., 2018; Sharma & Chatterjee, 2017).

Due to their small size and persistence, MPs are increasingly found in diverse ecosystems, including freshwater, marine, and terrestrial environments, even in the most remote locations such as the polar regions, deep-sea sediments, mountain tops, and even outer space (Napper et al., 2020; Porta, 2021; Zalasiewicz et al., 2016). The prevalence of MPs in such diverse environmental sectors and organisms suggested the urgent need for their effective control (Sun et al., 2021). To address this need, it is essential to identify the primary sources of MPs and their pathways into the environment. Moreover, it is imperative to recognize and acknowledge the significant role humans play, underscoring the importance of psychology to consider individuals' perceptions and receptiveness to embrace sustainable alternatives.

Microplastic fibers, also known as microfibers (MFs), are the most abundant form of MPs found in the environment (Acharya et al., 2021). Massive amounts of MFs, whether synthetic (e.g., nylon, polyester, acrylic) or natural-based (e.g., cotton, wool, linen), are released from common textile garments during different stages of production, use, and disposal (Carney-Almroth et al., 2018); particularly domestic and industrial laundering processes have been identified as the main source of primary MPs found in the oceans (De Falco et al., 2018; Prata, 2018). The vast majority of clothing (well over 60 percent) is made with plastics, making the fashion industry the second-largest generator of plastic waste after the packaging industry (Pensupa et al., 2018). A single 6 kg wash has the potential to release up to 700,000 MFs into the oceans through sewage effluents (Napper & Thompson, 2016). Over a third (35 percent) of all MPs contamination in the marine environment derive from synthetic clothing (Boucher & Friot, 2017). However, this estimation is likely conservative as it only accounts for primary microplastics released through laundering, without including textile microfibers deposited from the air, which are considerable (De Falco et al., 2020). MFs may also be released due to normal wear and tear of clothing through processes such as rubbing and brushing, which can discharge an equivalent amount of MFs as waterways discharge (Palacios-Matteo, van der Meer, & Seide, 2021).

Global clothing consumption has surged in the past decades, in part due to the stratospheric growth of fast fashion, which increased production and decreased the lifespan of clothing significantly (Liu et al., 2021). Although its impact is undeniable, MFs remain an invisible thread in clothing that is rarely considered (Acharya et al., 2021; Mishra et al., 2019). The accumulation of microfibers in nature will only increase as textile production grows larger and the rate at which plastic pollution enters the environment exceeds the rate of natural

removal processes or cleanup efforts (Chamas et al., 2020). As plastic pollution has become omnipresent and globally irreversible, it meets two essential conditions for a chemical pollution planetary boundary threat that can compromise biological and anthropogenic systems and processes (Beaumont et al., 2019; Villarrubia-Gómez et al., 2018).

Effectively addressing MP pollution requires a comprehensive and multifaceted approach that transcends the mere reduction of plastic waste, enhancement of waste management systems, and the promotion of sustainable substitutes to synthetic fabrics. It is equally important to consider the impacts of our daily clothing choices and encourage consumers to explore sustainable alternatives such as natural plastic-free textiles. Therefore, given the urgency to address environmental problems, it is imperative to gain a comprehensive understanding of how to change people's perceptions of sustainable clothing.

Despite the scientific consensus on the existence and consequences of anthropogenic climate change, many people remain divided on this issue and their personal contribution, making sustainable development a major challenge for contemporary society (Suldovsky, 2017). Most people lack adequate knowledge about the ramifications of microplastics and their associated problems (Henderson & Green, 2020). The misconceptions about the impact of the clothing industry on the environment and the poor understanding and awareness of MPs present formidable barriers to enacting change (Henderson & Green, 2020). However, since many environmental problems that pose significant threats to sustainability, among which environmental pollution, are rooted in human behavior, they can be managed by influencing relevant perceptions through information provision in order to mitigate their environmental impacts (IPCC, 2021; Vlek & Steg, 2007).

The adoption of pro-environmental behaviors is a critical path to instigate positive environmental change (Rosenthal & Ho, 2020). However, before engaging in such behaviors, individuals must first become perceptive of the existence of environmental issues, such as MP pollution. Albeit, awareness of the ecological effects of MPs is low and insufficient (e.g., Henderson & Green, 2020). To this end, this research proposes that pro-environmental behavior, including reducing laundry frequency and making more informed consumer choices, can be effectively stimulated by raising awareness about the prevailing misconceptions surrounding the environmental impact of the fashion industry through a combination of information provision and environmental self-identity theory. This study contends that these measures are more potent when combined than when they are individual, prompting the central research question: How can environmental self-identity be strengthened in order to enhance

the impact of information provision on changing perceptions about plastic-free sustainable clothing?

The following section outlines previous related works, and a conceptual framework of information provision is described. Additionally, the paper highlights the importance of biospheric values. The paper will proceed to delve into environmental self-identity theory and explain how past behavior plays a crucial role in shaping people's preferences, intentions, and behaviors in the environmental domain. The following sections will explain the current research and its methodology, including measures and ethical considerations. After, the results of the current research are presented and discussed with regard to theoretical and practical implications. Limitations are given, recommendations for future research are made, and, at last, the study's conclusions are summarized.

2. Literature Review

2.1 Information Provision

In order to engage in pro-environmental behaviors, individuals first need to be aware of the consequences of environmental problems (Hansla et al., 2008). However, people may not always realize the extent to which their specific actions negatively impact the environment (Bolderdijk et al., 2013). This gap between scientific knowledge and public awareness is often due to a lack of information. To address this knowledge deficit, various interventions have been introduced over time that provide factual information to individuals or organizations about the environmental consequences of their behavior (Schultz, 2002). These strategies can take many forms, such as data, facts, knowledge, or advice, and can be delivered through various channels, such as websites, reports, books, or lectures. Effective information provision requires the information to be accurate, relevant, frequent, and properly presented in a clear, accessible, and neutral manner, positioned in close proximity to the target behavior (Haaland et al., 2020). The aim of information provision is to change perceptions, motivations, knowledge, and norms, influencing attitudes towards sustainability by highlighting the pros and cons of different behavioral alternatives, ultimately leading to behavioral change, without actually changing the external context in which choices are made (Steg & Vlek, 2009; Stern, 1999).

Efforts to encourage pro-environmental behavior have proven to be exceedingly challenging (Dietz et al., 2003; Morren & Grinstein, 2021; White & Simpson, 2013), as previous attempts at persuasion have had limited success in enhancing actual behavior (Schultz, 1999; White et al., 2019). People are not necessarily motivated to act on knowledge alone (Staats et al., 1996). While possessing factual knowledge regarding what actions to take

and how to carry them out are crucial precursors to engage in specific behaviors, it is, in and of itself, an insufficient motivating force to induce significant structural, behavioral change (Fisher & Fisher, 1992, as cited in Steg et al., 2017). Conversely, the lack of such knowledge represents a potential barrier to behavioral change. Knowledge is thus better viewed as a necessary condition that ought to be combined with other interventions (Gardner & Stern, 1996).

Information provision only translates to actions under specific conditions, such as when environmental behavior change is convenient, easy, of low cost (in terms of money, time, effort, and social disapproval), or perceived as highly important (Steg & Vlek, 2009). More so, the efficacy of increasing awareness about the environmental impact of one's beliefs and actions, specifically, is highly contingent upon the extent to which this given information aligns with their personal values. Values are desirable and trans-situational goals that vary in importance and reflect what people find important in their lives (Crompton & Kasser, 2009). They contribute greatly to a person's sense of identity and serve as a guiding principle that affects how people see themselves, what type of person they want to be, and how they see the world around them (Verplanken & Holland, 2002). Values are likely to develop early in life and remain persistent over time as general and abstract principles (Feather, 1995; Stern et al., 1995). Since they are deeply ingrained in childhood experiences and cultural norms, they are notoriously difficult to alter (Feather, 1995). However, existing values can be strengthened and activated to enhance the effectiveness of information by making certain values more prominent (McKenzie-Mohr, & Schultz, 2014).

Biospheric values are particularly important to understanding and predicting pro-environmental behavior (Schultz & Zelezny, 1998; Steg & De Groot, 2012). Individuals who hold a strong affinity towards nature are more likely to experience concomitant changes in intentions as a result of such awareness-raising efforts (Stern & Dietz, 1994; Stern et al., 1995). Especially reminding individuals of past actions could predict future behaviors, as they provide a sense of consistency and reinforce one's self-identity (Schwartz, 1992; Van der Werff et al., 2014a).

2.2 Environmental Self-Identity

Self-identity refers to how someone thinks about, perceives, or evaluate themselves (e.g., Horowitz, 2012). Individuals are defined by specific and selective traits, qualities, abilities, physical attributes, and characteristics that represent them and contribute to the formation of their personal identity (Rogers, 2013). Simply put, self-identity is the label that one uses to describe oneself (Cook et al., 2002). It is composed of a collection of external

connections and social roles that an individual holds, which, in turn, induces habitual acts that validate their self-concept (Stets & Burke, 2000). Accordingly, self-identity seeks to ensure consistency between attitudes and behaviors (Christensen et al., 2004).

Environmental self-identity is the extent to which an individual sees themselves as a type of person whose actions are environmentally friendly (Van der Werff et al., 2013a). It prescribes a course of action that promotes pro-environmental and responsible decisions that are consistent with their sense of who they are (Van der Werff et al., 2013a). Environmental self-identity is conceptualized as an interdependent connection between a person and the nonhuman natural environment that affects how they perceive and interact with the world (Clayton & Opotow, 2003; Schultz & Tabanico, 2007). It represents the degree to which an individual values and sees the environment as an integral part of their identity (Stets & Biga, 2003). The stronger one's environmental self-identity, the more likely one is to engage in pro-environmental behaviors (Van der Werff et al., 2014b), even when there are no external incentives to do so (Van der Werff et al., 2013b).

A vast understanding of the environmental self-identity can thus provide valuable insight and offers unique variance in predicting environmental preferences, intentions, and behavior. The environmental self-identity is compromised and strongly influenced by an individual's biospheric values and past behavior.

However, there is a conceptual difference between values and self-identity. Although biospheric values and environmental self-identity are likely related, they may not always be consistent. Someone can have strong biospheric values and strive for unity with nature yet not have a strong environmental self-identity, as this identity also depends on the extent to which someone actually engages in pro-environmental actions (Biel et al., 2005).

People act based on their own expectations and on those of others. When individuals realize they have engaged in pro-environmental behaviors in the past (such as recycling, conserving energy, or using public transportation), they are more likely to view themselves as pro-environmental. Consequently, they are more likely to continue to act in an environmentally conscious manner in the future (Van der Werff et al., 2014a). This is because people infer their attitudes and beliefs from their behaviors and are strongly motivated to align their actions with their self-identity (Kashima et al., 2014). Thus, when people engage in pro-environmental behaviors, they infer that they must value the environment, and therefore, these behaviors become part of their self-identity (Bem, 1967).

Therefore, while self-identity depends on biospheric values and has a stable core, the strength of environmental self-identity can be strengthened to some extent by making people's

past environmental actions salient. Subsequently, reminding people of their past pro-environmental actions can strengthen their environmental self-identity, creating a self-reinforcing loop, which then motivates further pro-environmental behaviors and increases receptiveness towards information provision regarding topics such as MP (Van der Werff et al., 2014a; Van der Werff et al., 2014b).

3. Current Research

The present study aims to take a first step in exploring and examining how environmental self-identity can be strengthened to enhance the impact of information provision. This paper is among the first to specifically address and systematically investigate people's conceptions of microplastics and environmental behavior in this field. The goal of this paper is to alleviate widespread misconceptions about the environmental impact of the fashion industry and reshape perceptions about plastic-free sustainable clothing. To accommodate this ambition, this study will integrate insights from social and environmental psychology to provide the necessary background information to inform the design of an online experiment that will evaluate whether combining information provision with environmental self-identity can successfully change people's behavior and intentions. The experiment will serve as the primary data collection method and draws upon quantitative research methods to provide evidence on the impact of the experiment and assess the underlying process. This project is predicated on the hypothesis that information provision is most effective when environmental self-identity is strengthened. Ultimately, the findings of this paper will contribute to the development of effective strategies to influence perceptions as well as raise awareness on this issue at hand, and ignite other initiatives to encourage pro-environmental behavior.

4. Methodology

4.1 Design

The study employed an experimental design with four conditions (three experimental and one control condition). Each group was presented with a unique prompt before completing a standardized questionnaire that was consistent across all groups. The first experimental condition aimed to strengthen environmental self-identity by emphasizing past pro-environmental behavior. The second experimental condition focused solely on information provision about sustainable plastic-free clothing. The third experimental condition combined both environmental self-identity and information provision. The fourth and final condition served as the control group. Participants in this group were presented with a short text about

an unrelated and uncontroversial topic. For a complete overview of the experimental conditions, please refer to the appendix.

4.2 Participants

The sample consisted of 245 participants (63 participants did not complete the survey in its entirety as indicated by their completion time and progress and were removed from the analysis). Among the remaining 182 participants, ages ranged from 18 to 83, with a mean age of 38.92 (SD = 16.99). 2 participants did not provide their age. The majority of participants self-identified as female (52.4%), while 4 participants preferred not to disclose their gender. The remaining portion (45.4%) of participants identified themselves as male. 67.6% of the participants self-identified as Dutch; however, there were 20 other nationalities represented in the study. Of the total study sample, 89.7% of individuals hailed from Europe. The remaining responses were collected from various other countries, including the United States of America, Canada, Colombia, Malawi, Mexico, and Tunisia. Notably, 12 participants opted not to reveal their nationality.

There were no specific requirements for this research other than possessing adequate proficiency in the languages of the survey (English) and being above the age of 18. To ensure a diverse participant pool with varied backgrounds, the survey was distributed through online (social) media platforms using a snowball sampling technique, with my own personal network as a starting point. The survey remained open for 20 days.

4.3 Procedure

The online experiment was administered using Qualtrics (https://www.qualtrics.com). It was deliberately designed to be straightforward and accessible for all participants, with an estimated completion time of five minutes, depending on reading speed. Participants were presented with an informed consent form prior to the start of the survey. They were assured that participation was anonymous and voluntary, and they could withdraw at any time. After providing consent, each participant was randomly allocated to one of four conditions. Following the manipulation, participants were asked to complete a questionnaire that collected data to determine which of the four conditions was most effective in changing perceptions. Thereafter the participants were inquired about their intentions to purchase plastic-free clothing. Lastly, the survey concluded with socio-demographic questions strategically positioned at the end of the survey to reduce potential interference with the primary inquiries of the study. Upon completing the survey, participants were thanked for their contribution and debriefed on the study's goals and hypotheses.

4.4 Measures

Intentions towards purchasing sustainable plastic-free clothing were tested with a 2-item examination. Both items were formulated as statements ("I plan to buy plastic-free sustainable clothing" and "I intend to buy plastic-free sustainable clothing") commencing with the phrase "The next time I buy clothing:" Participants were asked to rank the statements on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7). The resulting data exhibited a correlation coefficient score of .78, with a mean score of 4.42 (SD= 1.44).

Environmental self-identity. The participants' level of environmental self-identity was determined with the use of a 3-item examination. The three statements presented were: "Acting environmentally friendly is an important part of who I am," "I am the type of person who acts environmentally friendly," and "I see myself as an environmentally-friendly person." These items were rated on a 7-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (7). The resulting scores yielded a (three-item) reliability score of .85, with a mean score of 4.99 (SD= 1.11).

Perceptions. In order to obtain a comprehensive and thorough understanding of the various aspects related to plastic-free clothing, this study developed 19 unique items to assess participants' perceptions. These statements were organized into ten categories, each consisting of two items (with one category comprising a single item). Participants were asked to rank the statements on a 7-point Likert scale, ranging from strongly disagree (1) to strongly agree (7).

All statements started with a standardized phrase: "Sustainable plastic-free clothing is:" followed by one of the items from the scale. Environmental perceptions were measured by two items: "good for the environment"; "Not really sustainable (a scam)" (α = .31, M = 5.37, SD = 1.01). Ethical perceptions were assessed by the items: "The ethical choice"; "The responsible choice" (α = .54, M = 5.64, SD = .99). The future outlook was considered with the two items: "Necessary for a liveable future"; "Not going to change anything" (α = .36, M = 5.51, SD = 1.1). The trustworthiness was evaluated using the items: "An unattainable goal": and "Not trustworthy" (α = .23, M = 3.03, SD = 1.22). Perceived quality was tested by the items: "Less durable"; "Less comfortable" (α = .41, M = 2.96, SD = 1.13). The financial aspect was gauged with the items: "Too expensive"; "Value for money" (α = .61, M = 3.83, SD = .97). Perceived difficulty was estimated using the two items: "Too difficult to find"; "Too difficult to maintain" (α = .17, M = 3.91, SD = 1.15). The social aspect was measured by the two items: "Not fashionable"; "Less prestigious" (α = .46, M = 2.58, SD = 1.32). Societal consequences were tested using the items: "Polarises society"; "Divides society" (α = .63, M = 3.29, SD = 1.42). Finally, the last item asked participants to rate whether sustainable plastic-free clothing was

"not for me" ($M = 2.48$, $SD = 1.40$). The obtained outcomes demonstrate alpha scores that fall below the initial expectations, indicating a lack of reliability in the scales used.

The development of the scale was informed by a review of non-academic sources, such as blog posts, advertisements, and open online forms, in order to gain insight into the current prevailing concerns of the general public regarding sustainable clothing.

4.5 Ethical consideration

This study has obtained ethical approval by the ethics committee of Campus Fryslân (University of Groningen). Participation in this study was entirely voluntary, and participants were free to withdraw their involvement at any time without consequence or the need to provide a reason. The survey used in this study was designed to be completely anonymized and did not require participants to disclose any personal, private, or sensitive information. To ensure compliance with GDPR regulations, all data generated as part of this research project will be stored securely for a period of five years by the University of Groningen. Access to this data will be restricted to the research team, consisting solely of myself and my supervisor.

5. Results

In order to investigate the primary hypothesis, which posits that enhancing ESI leads to greater effectiveness of information provision, an analysis of variance (ANOVA) was conducted.

The analysis of the intention scale revealed an F-value of .81 with 179 degrees of freedom in the numerator and 3 degrees of freedom in the denominator ($F(179,3) = .81$, $p < .05$), indicating no significant results. The means and standard deviations for each condition were as follows: Information-condition ($M = 4.52$, $SD = 1.35$), Identity-condition ($M = 4.28$, $SD = 1.25$), Combined-condition ($M = 4.66$, $SD = 1.71$), and Control-condition ($M = 4.26$, $SD = 1.39$). On a descriptive level, however, the means align with the anticipated direction. The combined condition demonstrates the highest mean; conversely, the control group exhibits the lowest mean. These findings seem to suggest that providing information and reminding individuals of their past environmental behavior do influence intentions to a certain extent, albeit to a lesser degree when employed separately.

Similarly, the analysis of the environmental self-identity scale yielded an F-value of 1.38 with 179 degrees of freedom in the numerator and 3 degrees of freedom in the denominator ($F(179,3) = 1.38$, $p < .05$), indicating no significant findings. The means and standard deviations for each condition were as follows: Information-condition ($M = 4.86$, $SD = 1.3$), Identity-condition ($M = 5.22$, $SD = .77$), Combined-condition ($M = 4.82$, $SD = 1.12$), and

Control-condition (M = 5.09, SD = 1.15). At the descriptive level, the ESI was enhanced most in the identity-condition group, which reminded people of their past behavior. The control condition followed closely, thereby seemingly implying that the provision of information may reduce the enhancement of self-identity.

Furthermore, the research also sought to further investigate and explore the effect of the different manipulations on the general perceptions held towards sustainable plastic-free clothing. The study results indicated that none of the perception scales reached statistical significance (p > .05). Refer to Table 1 for the results of each perception scale and Table 2 for the means and standard deviations of the respective scales. Overall the results are divergent and inconclusive. On a descriptive level, only the scores for future outlook appear to have a tendency to align with the hypothesis. Notably, the control condition exhibits the highest mean scores for ethical, quality, difficulty, and social scales.

Another intriguing finding from this study is that nearly half (46%) of the participants reported not knowing whether they had purchased sustainable plastic-free clothing in the past. Moreover, 14% of the participants indicated that they had never bought sustainable clothing before, while 25% reported purchasing it only once or twice. Just 15% of all participants stated that they frequently purchase sustainable clothing.

Table 1

F-value and P-value of the measured perception scales

Perception Measure	F-value, (degrees of freedom)	P-value
Environment perception	.36 (179,3)	< .05
Ethical perception	.65 (179,3)	< .05
Future outlook	1.6 (179,3)	< .05
Trustworthiness	1.2 (179,3)	< .05
Perceived quality	.95 (179,3)	< .05
Financial aspect	.11 (179,3)	< .05
Perceived difficulty	1.8 (179,3)	< .05
Social aspect	1.97 (179,3)	< .05
Societal consequences	1.73 (179,3)	< .05
Not for me	1.24 (179,3)	< .05

Table 2

Mean and standard deviation of the measured perception scales

Perception Measured	Information Condition		Identity Condition		Combined Condition		Control Condition	
	M	SD	M	SD	M	SD	M	SD
Environment perception	5.48	.98	5.39	.83	5.27	1.22	5.35	.97
Ethical perception	5.55	1.05	5.68	.83	5.57	1.2	5.82	.84
Future outlook	5.55	.96	5.26	1.17	5.76	1.14	5.5	1.14
Trustworthiness	3.06	1.03	3.33	1.32	2.72	1.3	2.96	1.17
Perceived quality	3.02	1.21	3.04	1.14	2.72	1.06	3.06	1.13
Financial aspect	3.76	.96	3.87	.93	3.8	1.05	3.85	.96
Perceived difficulty	3.97	1.21	3.62	1.12	3.89	1.16	4.19	1.08
Social aspect	2.58	1.35	2.49	1.38	2.3	.98	2.98	1.48
Societal consequences	2.78	1.53	2.28	1.21	2.35	1.54	2.45	1.3
Not for me	3.55	1.31	3.11	1.35	2.99	1.57	3.46	1.49

6. Discussion

Plastic pollution, particularly microplastics, poses a significant threat to the environment and human well-being. The fashion industry, driven by synthetic fabrics, is a major contributor to the release of MF into the environment through laundering processes. To effectively address this issue, this paper has explored the potential of a novel systematic and comprehensive approach that combines information provision and environmental self-identity theory to shift prevailing perceptions and dispel misconceptions surrounding sustainable plastic-free clothing, aiming to promote pro-environmental behavior in this specific context.

While previous research has explored the effects of information provision and environmental self-identity independently, the integration of these factors combined remains largely unexplored. This study sought to address this gap by testing whether an augmented environmental self-identity could enhance individuals' openness to receiving information and subsequently influence their perceptions regarding plastic-free sustainable clothing. However, the outcomes of this research failed to demonstrate statistically significant and conclusive results.

Upon analyzing the means of participants' intentions to purchase sustainable, plastic-free clothing, no differences were found between the four conditions: information-condition, identity-condition, combination-condition, and the control-condition. This indicates that regardless of the condition group, all participants exhibited similar levels of intention to purchase sustainable, plastic-free clothing. Likewise, no considerable differences were observed in the self-identity scale among any of the condition groups. Participants across all four condition groups reported comparable levels of the extent to which they see themselves as a type of person whose actions are environmentally friendly. Furthermore, the study revealed no notable differences between condition groups within the perception scales. That is, current perceptions of sustainable plastic-free clothing were again unaffected by the manipulations of this study. Accordingly, there is deficient evidence to support the initial hypothesis.

Nevertheless, this study has contributed to the expansion of our understanding regarding the current prevailing perceptions within the context of sustainable fashion. First, the theoretical implications of the study will be presented, followed by an examination of the practical implications. Subsequently, the limitations of the research will be discussed, along with suggestions for future research.

6.1 Theoretical implications

Consistent with the preceding theoretical framework proposed by Steg and Vlek (2009), the findings of this study indicate that the information condition does not demonstrate a notably higher mean than the other conditions. This suggests that the mere provision of information is inadequate to induce a change in perceptions. The results of this study thus revalidate the theory of Steg and Vlek (2009).

Even more, on a descriptive level, the results even reflect a tendency in which the strongest reaction is observed in the control condition. In contrast with the literature, this suggests that the absence of any information may be more effective in promoting sustainable behavior than implementing any form of intervention. These findings can be attributed to the novelty of the subject. The manipulation may have triggered emotional reactions among participants due to the unfamiliarity of the topic, which were not measured in the current project. Specifically, feelings of guilt and concern for the future might have been elicited. Emotions have been identified as an important predictor of sustainable behavior (Brosch, 2021; Taufik & Venhoeven, 2018). Consequently, participants may have approached the questionnaire subjectively, potentially becoming closed off or resistant to the presented information. This demonstrates the need for more objective measures that increase the contextuality of the questions, reducing their susceptibility to emotional influences when assessing sustainable behavior.

It was proposed that ESI on its own may however still have the potential to influence perceptions. As Van der Werff et al., (2014a) demonstrated, ESI can be strengthened by reminding individuals of past pro-environmental behavior and, in turn, influencing behavior. However, the manipulations employed in this research did not yield conclusive results to either support or refute the proposition that an enhanced ESI is impactful in changing actual perceptions, as they did not effectively strengthen the ESI of participants. It is possible that the strength of the manipulation used in the study may have been too weak for the desired effect. If the manipulation did indeed arouse emotions that were not adequately accounted for in the experiment, it could have compromised the intensity of the manipulations. However, further research is needed to definitively ascertain whether these factors were responsible for the insignificant results.

Moreover, contrary to initial expectations, the means of the combined condition do not surpass those of the other conditions. The inclusion of both information provision and ESI does not appear to contribute significantly to the desired outcome, thereby failing to support the

presumption that enhancing ESI improves the impact of information provision. This may, in part, be due to the unsuccessful manipulation of the ESI.

While the results of the perception scales lack a distinct pattern, the means across different conditions for each facet exhibit considerable similarity. Furthermore, the standard deviations are relatively modest. The environmental perception scale, for instance, displays a maximum mean of 5.48 in the information condition and a minimum of 5.27 in the combined condition, with the highest standard deviation being only 1.22. These findings imply that irrespective of the manipulation employed, there is a general consensus among the public regarding specific aspects of the measured perceptions.

Overall the results reflect higher-than-average means, indicating that people have a rather positive perception of sustainable clothing and indented to purchase it. Nevertheless, despite this positive association, only 15% of the participants reported purchasing sustainable clothing frequently. More so, this study found that half of the participants do not pay much attention or are unaware of the materials they regularly wear. These findings align with the previously mentioned research of Henderson and Green (2020), which highlighted that most people lack adequate knowledge about the implications of MP pollution. If individuals are unaware of the reasons behind the need for change, their positive perception alone will not motivate them to alter their behavior. Moreover, a recent study by Rathinamoorthy (2019) noted that although people have become increasingly more aware of the negative environmental impact of clothing manufacturing processes and express moderately strong levels of general environmental concern, it does not translate into environmentally responsible apparel consumption. The moral inclination of customers to engage in sustainable and ethical purchases appears to be influenced more significantly by their attitudes and lifestyles rather than their knowledge. This discrepancy between intention and behaviors is attributed to the fact that emotional appeals tend to be more effective than rational appeals in driving behavior change (Eckhardt et al., 2010).

Though not directly relevant to the current study, this finding has valuable implications for the broader academic field. The study can serve to reflect the prevailing public opinions concerning sustainable plastic-free clothing. It is demonstrated that in spite of the presence or lack of existing knowledge, there are widespread beliefs that associate such clothing with, for instance, positive environmental outcomes. This finding offers a foundation for developing theoretical frameworks on public awareness of sustainability or other related topics. It provides a starting point for further exploring and understanding public perceptions in the context of sustainable clothing.

6.2 Practical implications

Beyond the realm of academia, this paper serves as a catalyst for raising awareness and provoking thoughts on the matter to subsequently advocate pro-environmental choices. The findings of this study present potential recommendations for policies promoting sustainable plastic-free clothing. Based on this study, changing perceptions and cultivating a more mindful consumer base to promote sustainable and ethically conscious consumption patterns appear very challenging. Therefore, the fashion industry, specifically sustainable brands, should incorporate the insights gained from this research into their practices to inform and shape regulations that aim to guide the public to make more informed purchasing decisions. They should focus on new ways to engage with the public, as this study revealed that providing information can also evoke contrasting reactions. Currently, consumers possess limited knowledge and awareness regarding the materials and manufacturing processes of their clothing while simultaneously forming premature opinions about them. Therefore, campaigns should prioritize clarifying what constitutes sustainable fashion and what does not.

6.3 Limitations and future research

Unfortunately, the study does have some limitations. Firstly, the third condition group of the experiment, which involved a combination of interventions, was naturally longer than the other conditions. This could have potentially affected participant attention and engagement with the survey. While recognizing that a 'combined' condition is inherently lengthier, it is imperative for future research to consider and minimize its extent.

Secondly, it is also important to note that the scope of this study is insufficient to comprehensively account for the myriad of internal and external factors that influence an individuals' perceptions. As this study stands as one of the first explorations in this particular domain, the absence of prior knowledge to rely on constrained the development of the scales to be devised from scratch. To address the broad range of possible influences on perception, the study employed scales with a wide scope. Consequently, certain items within the scales may have been too general in nature and, therefore, not measure the same concept. The lack of specificity allowed participants to interpret the items differently, leading to a lower-than-desired alpha score and inconclusive results. Instead, future research should develop reliable pre-tested scales for this purpose and adopt a more focused approach concentrating on specific facets that shape perception to avoid ambiguity and strengthen the effect of the manipulation.

Another deficiency is that the study presupposes that participants have sufficient English proficiency to comprehend the text and statements. The language style used in the prompts aimed to be clear and straightforward. Nevertheless, despite these precautions,

participants expressed concerns regarding their English proficiency and their inability to express themselves or elaborate upon their answers fully. To address these limitations, future research could consider offering the survey in multiple languages and integrating pre-tested open-ended questions that allow participants to freely define and express their understanding, such as "What does 'sustainable clothing' mean to you?"

Furthermore, despite attempts to recruit a diverse group of participants, the sample size may not have been sufficiently extensive to capture a comprehensive range of perspectives. Although prior power analysis revealed a sample size of at least 40 participants per condition to be satisfactory, a larger sample size would have been preferable as it would provide a more accurate depiction of the reality being examined.

Additionally, as a result of using my personal network as a starting point for recruitment, the majority of participants were from Western societies, and there is a lack of the elderly generation. Therefore, the generalizability of the findings to other populations and generations may be limited due to varying levels of awareness and diverse policies across countries and time. To mitigate these biases, future research should be conducted on a larger scale, incorporating a greater number of participants with even more diverse backgrounds.

Lastly, people who were already environmentally conscious may have been influenced differently by the interventions. Future research could benefit from establishing more specific conditions for participation and incorporating additional self-assessment questions to gauge participants' involvement in sustainability. This approach would help researchers account for potential biases and enhance the overall validity and reliability of the study.

While this study addresses specific issues of MP in the fashion industry, it is important to acknowledge the broader array of challenges that exist beyond the scope of this study. These encompass a wide array of environmental concerns, including excessive water pollution and consumption, waste accumulation, chemical usage, greenhouse gas emissions, soil degradation, and rainforest destruction in the fashion industry (e.g., Jacometti, 2019; Niinimäki et al., 2020). Additionally, social factors such as poor working conditions, long hours, low wages, forced and child labor, health risks, and union restrictions further compound the industry's complexities (e.g., Charpail 2017). To facilitate a comprehensive understanding of the fashion industry, further investigation is warranted to delve into its extensive range of challenges.

7. Conclusion

This paper sought to investigate how environmental self-identity can be strengthened in order to enhance the impact of information provision to change perceptions about plastic-free sustainable clothing. To examine the relationship between environmental self-identity and the effectiveness of information provision in promoting sustainable behavior, an online experiment was conducted. The experiment assessed participants' intentions, self-perception, and perception of sustainable clothing. However, the obtained results were inconclusive and statistically insignificant, failing to support the initial hypothesis. Enhancing environmental self-identity does not improve the impact of information provision. In fact, the implemented interventions may have even had adverse effects. It has proven to be very challenging to change perceptions and intentions effectively.

Nonetheless, the findings of this study can still be valuable as a mirror of the current public opinions on sustainable plastic-free clothing. In light of these findings, it becomes evident that to successfully address microplastic pollution, it is crucial to foster collective efforts toward a more sustainable future and develop more impactful strategies to promote sustainable behaviors in the fashion industry and beyond. Further research is required to gain a deeper understanding of how perceptions toward sustainable, plastic-free clothing can be altered.

8. References

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9. Appendix

The manipulations

Condition 1: Information Provision:

Global plastic production has increased exponentially in the past decades and became an integral part of society due to their low cost, adaptability, and endurance. However, plastic pollution poses serious threats to our planet and its inhabitants. Microplastic fibers, the most abundant form of microplastics found in the environment, are released from common textile garments (e.g socks, sweaters, etc.) during production, use, and disposal. The fashion industry is the second-largest generator of plastic waste after the packaging industry, and over 60% of clothing contains (some form of) plastic. As a result, a single 6kg wash can release up to 700,000 microfibers that end up in our oceans. The accumulation of microfibers in nature will only increase as textile production grows larger. Therefore, microplastics in clothing are a huge environmental hazard.

Condition 2: Environmental Self-Identity

At the heart of environmental conservation lies individual actions that collectively make a difference. Please take a moment to think about everyday actions you engage in that reduce your environmental impact. These actions could include turning off electrical devices instead of putting them on standby, not throwing litter on the street, turning off lights in empty rooms, turning down the thermostat when leaving home, separating all waste, and going to work or school by bike instead of by car. Without even realizing it, you already willingly engage in pro environmental behavior every day.

Condition 3: Combination

At the heart of environmental conservation lies individual actions that collectively make a difference. Please take a moment to think about everyday actions you engage in that reduce your environmental impact. These actions could include turning off electrical devices instead of putting them on standby, not throwing litter on the street, turning off lights in empty rooms, turning down the thermostat when leaving home, separating all waste, and going to work or school by bike instead of by car. Without even realizing it, you already willingly engage in pro environmental behavior every day.

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Condition 4: Control

   As social creatures, we often look to others for signals on how to behave in a particular setting. When there's no one around, we still try to figure out what's okay by looking for signs in our surroundings. For example, if we see a broken window that hasn't been fixed, we might assume it's okay to break another one. This idea is called the Broken Windows theory, which suggests that visible signs of disorder can lead to more serious crimes. Environmental disorders can negatively influence our behavior as the context we're in can have a big impact on how we feel and act, but it's not always easy to change our surroundings.