Sustainability perceptions of high-end fashion products in the Metaverse: a comparative investigation on different media settings

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Abstract

Over the past years, fashion customers and stakeholders have become more concerned to how sustainability goals are being implemented. Despite the increasing relevance of 3D virtual reality, limited attention has been devoted to exploring its effects on consumer sustainability perception. This study investigates how consumers rank a set of *objective* and visible practices and of *subjective* responses and emotions when exposed to Metaverse comparing the outcomes with 2D environments. Findings suggest the presence of significant relationships between the environment in which the discussion is conducted, and the way consumers perceive specific practices and emotions connected to sustainable high-end fashion products.

Keywords: Metaverse, high-end fashion, sustainability, perception, emotions, virtual reality, virtual technology, virtual worlds, Avatar

1. Introduction

Relevant trends, affecting industry structure, conduct and performance, are currently shaping the fast-evolving High-end Fashion sector. Among others, two have become increasingly important: Corporate Social Responsibility (CSR) activities and immersive Advanced Technology.

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As regard the first one, CSR initiatives, and sustainability, are now becoming an industry-standard (Colucci, Tuan, & Visentin, 2020) affecting both the supply side - and how company design, source, produce and distribute their products (Perry & Towers, 2009; Bubicz, Barbosa-Póvoa, & Carvalho, 2021) - , and the demand-side of the market, and how consumers engage (Kucukusta, Perelygina, & Lam, 2019), interact (Hur et al., 2020), select (Kim, Yin, & Lee et al., 2020), and bond (Thompson et al., 2017) with brands.

Consumers expect brands to play a greater role in sustainability and companies, in order to meet those priority needs (Papahristou & Bilalis, 2017), and are increasingly embracing trajectories of sustainable development and corporate social responsibility (Ethical Fashion Forum 2016). Therefore, market success is affected, among others, by the full alignment between customers' expectations on sustainability and tangible actions of companies, that are not perceived as woke-washing (Vredenburg et al., 2020). High-end fashion companies are then contributing to a sustainable ecosystem (Arribas et al., 2022), by creating a solid footprint in sustainability (Jung & Jin, 2014), modifying their current global supply chain design (Vachon & Klassen, 2007), aligning their product development processes (Armstrong & LeHew, 2011), their activities for stakeholders (Ki et al., 2020). Consumers are more attracted by global CSR initiatives that are noticeable and recognisable (Amatulli et al., 2018), clearly linked to the brand (Sung & Lee, 2023), rooted in their supply chain and production processes (Kong, Ko, Chae & Mattila et al., 2016), and that are immersive (Lee et al., 2021) or are designed with full involvement of customers (Edinger-Schons et al., 2020). These initiatives connected to the philanthropic dimension of CSR, are also more effective in boosting consumers' Willingness To Buy (WTB) (De Angelis et al., 2018). Moreover, it has been discovered that communication between fashion companies and consumers is crucial (Hur & Cassidy, 2019). According to Fisher et al. (2008), when participants are provided with information regarding environmental consequences, they tend to reflect on their behaviours

and are willing to change them. Fisher et al. (2008) also found that employing the appropriate form of media for sustainability information would be beneficial to consumers.

As regard to immersive Advanced Technology, extant research dedicated specific attention to the role of MarTech in supporting the sustainability positioning of high-end fashion companies (Pereira et al., 2022). For example, previous studies showed, in the communication of the brand and products (Brooksworth et al., 2022), the importance of social media (Sivarajah et al., 2020), recommendation systems (Chung et al., 2020), the role of supply chain in this respect and their impact on consumer perceptions (Kontu &Vecchi, 2014), emotions (Chae & Ko, 2016) and decision-making (Kim et al., 2020).

Limited attention has been devoted to (i) the impact of communication and interactions through modified reality on consumers' perception of sustainability and, specifically, when information is delivered through the Metaverse (as opposed to other tech-based 2D environments), and to (ii) how opinions are formed through the interaction of customers in a meta-space.

This research then investigates the differential effect in sustainability perception that consumers have when exposed, in a context of para-social interaction, to sustainable products of a well-known high-end fashion company, confronting the results when exposed to the same content in the 2D dimension (through a 2D App platform) vs. the 3D dimension, using a widely known 3D app which provides access to the Metaverse.

Para-social interactions in technology-mediated contexts take place between users and digital characters (or avatars) in virtual environments (Kaplan, & Haenlein, 2020) and happen without any actual reciprocal communication or personal contact (Zhang et al., 2022), despite customers might experience a feeling of intimacy with a media personality (or avatar) (Haenlein & Kaplan, 2019). As a result, para-social interactions in 3D virtual reality have the

potential to be more intense and emotionally charged compared to those in other forms of media (Yuan et al., 2022).

Through a controlled experimental design, based on the wait-list control group model approach (Elliot, 2002), we assessed whether the media setting influences *objective* and *subjective* elements of consumer's perception of sustainable products, in contexts of para-social interaction.

The following paper is structured as follows: after an overview of the extant literature and the development of our research hypothesis, we present research methodology and analysis, together with the main implications of our studies.

2. Theoretical Background and Research Hypothesis

In high-end fashion, consumers form their opinion about how much brands and products are truly sustainable from their understanding of the respondence of the company to a set of *objective* and visible practices (Dwivedi et al., 2018; Japutra & Molinillo, 2019). This is, affected by the interchange of their opinions with other relevant stakeholders (Kozinets et al., 2010) and by the setting where the discussion is taking place (Kong et al., 2021), and might elicit *subjective* responses and emotions (Byrum, K., 2019).

In this respect, over the past years, business front-runners have become more conscious and attentive to how sustainability goals are being implemented. Several companies (i.e., Stella McCartney) applied the green supply chain method (GSCM) (Vachon & Klassen, 2007), that integrates the relevant *objective* elements of sustainability perception. Those functional elements show the company's commitment toward the environment and include items such as product design, material selection and sourcing, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life (Puspita, H., & Chae, H., 2021) and waste management. They also affect customers' attitude

towards the brand, attitude towards sustainable products (Kim & Hall, 2015), Willingness-To-Buy (Amatulli et al., 2021), and brand credibility (Abu Zayyad et al., 2021).

For the scope of this research, the most relevant functional drivers, as identified by extant literature (Dyllick & Rost, 2017) and confirmed by a panel of sector experts, can be outlined in i) components ii) responsible supply chain iii) global commitment vi) circularity v) strategic sustainability plan (see Table 1).

Table 1. Functional items that support customers' perception that a high-end fashion product is sustainable

Item	Description	Reference
Components	The company utilize **low impact materials** (e.g., recycled, biobased, organic, etc.)	Dyllick, T., & Rost, Z. (2017)
Responsible supply chain	The Company has a **responsible management** of the supply chain (e.g., respect for human rights and health and safety)	Dyllick, T., & Rost, Z. (2017)
Circularity	The Company is able to **design products** according to the circularity criteria (e.g., eco-design, ability to disassemble, disposal, sustainable inputs, etc.)	Dyllick, T., & Rost, Z. (2017)
Global commitment	The Company **participate** in global commitments (e.g., Just Transition, joining The Fashion Pact initiative, submission of UNGC, etc.)	Dyllick, T., & Rost, Z. (2017)
Strategic Sustainability Plan	The Company has a public Strategic Sustainability Plan with a **public, quantitative and challenging** commitment and targets	Dyllick, T., & Rost, Z. (2017)

Objective elements (ILFI, 2015a) are complemented by emotional and *subjective* factors (Dyllick et al., 2017) to form sustainability perceptions. Thus, it is crucial for businesses to elicit an emotional response from customers regarding sustainability, so that they will ultimately make an informed - but emotionally charged - purchase that will have a beneficial impact on their perception (Fuxman et al., 2022). The main relevant *subjective* factors, identified by extant literature (Laros & Steenkamp, 2005; Algoe & Haidt, 2009) to measure the elicited emotions associated with the exposure to sustainable high-end fashion products are: i) pride ii) contentment iii) happiness iv) gratitude v) inspiration vi) elevation (see Table 2).

Table 2. Emotional factors related to consumers' sustainability perception

Item	Description	Reference
Pride	Occurs when a consumer feels **superior** compared to another person because of the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Contentment	Is a feeling of **quiet satisfaction** generated by the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Happiness	An emotional state characterized by feelings of **joy** and **fulfilment** generated by the product	Laros, F. J., & Steenkamp, J. B. E. (2005)
Gratitude	Involves being **thankful** and **appreciative** towards the company behind the product	Algoe, S. B., & Haidt, J. (2009)
Inspiration	Being mentally stimulated by the company behind the product to **do** or **feel** something	Algoe, S. B., & Haidt, J. (2009)
Elevation	Is a response to acts of **moral beauty** of the company behind the product in which individuals feel as though they have become less selfish, and they want to act accordingly	Algoe, S. B., & Haidt, J. (2009)

Many studies found that exposure to *subjective* and *objective* factors is affected by both the media (traditional vs. new) and the context (individual vs. interactive) where the stimuli is received (Hamilton et al., 2021). Consumers, in fact, tend to rely more on *objective* factors when they are in social contexts/ group discussions (Mesmer-Magnus & DeChurch, 2009). Furthermore, when interacting in the 2D/3D environment, the shaping of para-social relationships has an impact on the functional elements of the user's perception and understanding of the transmitted information (Dwivedi et al., 2022).

Different media setting also significantly influences the consumer's perception of the message both on traditional (Wright, 1974; Stafford & Day, 1995) and on new and interactive two-dimensional (2D) media (Pezzuti et al., 2021).

Nowadays, the Metaverse - a 3D online virtual world that allows people to be virtually connected and interact with each other, the environment, 3D objects, and businesses (Daşdemir et al., 2022). Hence, as stated by Wu et al. (2021), "compared to two-dimensional (2D) online platforms, the 3D virtual space provides a more immersive and interactive experience that allows it to transmit a great amount of information and thus enhances customers' emotions,

attitudes, and behaviors toward the product". The Metaverse marketing literature is in its early stages, but it is fast expanding across multiple sectors, including retailing and high-end items (Joy et al., 2022).

As the Metaverse provides consumers with a multi-sensory experience as opposed to the conventional 2D environment's single-sensory stimulus (Laukkanen et al., 2022), it can impact customers' perception by providing a more realistic representation of products and services, allowing customers to experience them in a more tangible way and thus enhancing the *objective/functional* factors of customers' perception (van Herpen et al., 2016). Furthermore, the use of VR technology enables the creation of a more interactive and immersive experience that can be effective in eliciting emotions and affective responses (Martínez-Navarro et al., 2019).

To the best of our knowledge, the effect of the 3D environment on customers' sustainability perception – deployed in a para-social context of a group of individuals - is currently been overlooked, as prior studies mostly focused on the impact of different media (i.e., 2D technology, radio, television). The research then tests and compares the differential influence of the media (Metaverse vs. 2D environment) on customers' priority association of *subjective* and *objective* factors elicited by the visual display of high-end sustainable fashion products.

In line with this focus, this research argues that the use of 3D virtual reality rather than 2D technology will have a greater impact on certain critical intrinsic/functional (i.e., components, responsible supply chain, circularity, global commitment, strategic sustainability plan) and emotional/*subjective* (i.e., pride, contentment, happiness, gratitude, inspiration, elevation) factors of consumer perception. This reaction may be rooted in the fact that, as shown by previous studies (van Herpen et al., 2016; Wu & Whang et al., 2021) the use of a different media conditions the transmission of the stimulus to the consumer. In detail, the main focus of

our research refers to assessing how much customer's perception derives from the exposure to a high-end sustainable item, is affected by the different usage of media.

Therefore, it is hypothesized that:

- The Metaverse has a greater impact towards the *objective* elements of sustainability perception if compared to 2D environment.

- The *subjective* elements of sustainability perception are enhanced during the product's exposure in the Metaverse (vs. 2D platforms)

In order to give a more detailed explanation of each factor of the consumers' sustainability perception and to explain how each of these is influenced by the media setting in which the discussion takes place, we decided to split the two main hypotheses into 11 detailed hypotheses.

In particular, from H1 to H5 we tested the impact of the Metaverse over the *objective* elements of sustainability perception (5 elements respectively: components; responsible supply chain, circularity, global commitment, strategic sustainability plan) compared to the 2D environment.

Accordingly, from H6 to H11 we evaluated the impact of the Metaverse over the *subjective* elements of sustainability perception (6 elements respectively: pride, contentment, happiness, gratitude, inspiration, elevation) compared to the 2D environment.

3. Methods

3.1 Data collection and sample

Data was collected at the end of each experiment from 137 master's degree university students. Preliminary information included respondents' demographic and involvement with technology (See Appendix 1). The sample was divided into 2 macro-groups: A and B, formed respectively of 15 teams and 16 teams of students. The number of students per team varied in

a range of four to six. The reward for participating in the project was extra points in their final course grade. Thirty-one per cent of the participants were female (n = 42) and sixty-nine per cent male (n = 94), their average age being twenty-two years (SD = 1.35).

3.2 Procedure and Task

All participants were exposed in advance to a training stage necessary to become confident with the use of the 3D App platforms and the VR headset tool to handle the Metaverse world. In particular, the training process involved the participation of specialised tutors aimed at supporting students in exploring the 3D environment and guiding them step by step in the process. More specifically, once having worn the Oculus and got familiar with its related joysticks, students were led to the creation of a personalised and resembling avatar, with which they will participate in the discussion in the Metaverse. The training stage lasted from 15 to 20 minutes for each student.

On the other hand, individuals were already familiar with the use of 2D App platform, as part of other online activities. Pre-tests were run to evaluate participants' attitudes and usage motivation for technology.

The experiment was conducted in two different rounds, following the wait-list control group model approach (Elliot, 2002), where participants used sequentially the two different technologies (3D Metaverse and 2D App).

Specifically, in round one, each team of macro-group A performed a prioritization task to reach group consensus on the ranking of the relevance of *objective* factors ("experimental group") in the Metaverse, while the macro-group B was exposed to the same task on the 2D App platform ("control group"). In round two, the two groups were reversed and focused on ranking *subjective* factors. As a result, each group meeting ended when the group's leader exposed the answers agreed upon during the 30-minute meeting. Respondents knew that every groupwork has been evaluated by the teaching team. More specifically, after conveying the

visual of a product (emotional elements) and, subsequently, the product's details (functional elements) in both 3D and 2D platforms during the intervention phase, the students were provided with the central discussion questions and the respective ranking (See Appendix 2).

The structure of the experiment had the aim to avoid bias in the students' responses, given the novelty of the Metaverse platform, and to allow participants to work with the same technologies. In each round, drawing on Elliott et al., (2002), the first intervention group was exhibited to the stimulus prior to the second one functioning as a control group. This method allows us to include students from both macro-groups in the project while keeping technological constraints in mind. To ensure that the variance of the process was minimized and to guarantee equality of information between the students, a structured protocol for both the training and intervention phases was prepared.

3.3 Stimuli and measurement scales

To establish adherence to a real managerial situation, the business case and the associated stimuli were developed with the support of the management of a leading, well-known international high-end fashion company. Stimuli were visual display of the product, related details and the sustainability practices of the company.

Objective and *functional* factors were based on Dyllick & Rost (2017) work on the drivers of product sustainability, and Laros & Steenkamp (2005) and Algoe & Haidt (2009) on consumer behaviour and emotional response.

3.4. Data Analysis and Measures

After registering the ranking run from each focus group, we calculated the frequency of occurrence. Referencing Thurstone's Law of Comparative Judgment and the scaling tools he elaborated for forced-choice scales (2017), the frequency of occurrence was put into a matrix in order to be turned into interval scale data (See Appendix 3). Regarding quantitative data analysis, a chi-squared test of independence was carried out using the SPSS software by

retrieving data from all the group-works, separating those of round 1 from round 2, to check whether the media impacted the relative relevance, as mirrored by the ranking, of the *subjective* and *objective* factors.

Figure 1. Experimental Design
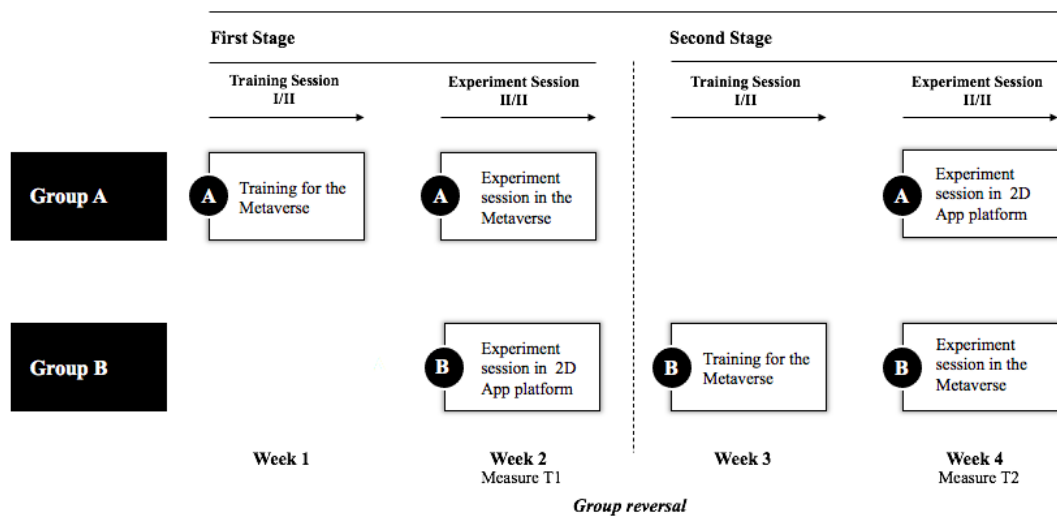
4. Results

The results of the two pre-tests highlighted the proper participants' involvement towards the use of a new technology (M= 4.3; SD= 1.46) and the related usage motivation (M= 4.34; SD= 1,55).

The analysis of the occurrences of the ranking of individual items showed that different priorities in both the first (i.e., *objective*/ functional elements) and second (i.e., *subjective*/ emotional elements) round (Table 3) were manifested in the discussion held in Metaverse vs. 2D App.

Table 3.a. Occurrence of ranking of *objective/functional* factors related to consumers' sustainability perception

	Media	Position				
Item		*1*	*2*	*3*	*4*	*5*
Components	3D App	4	4	2	2	2
	2D App	7	5	1	1	0
Responsible supply chain	3D App	4	2	3	3	2
	2D App	1	4	6	3	0
Circularity	3D App	1	5	2	2	4
	2D App	1	4	5	2	2
Global commitment	3D App	2	1	2	4	5
	2D App	1	0	1	2	10
Strategic Plan	3D App	3	2	5	3	1
	2D App	4	2	0	7	1

Specifically, students who held meetings in the Metaverse rated the "Components" (mean position=3,4) most highly than the other factors, with a (-0,9) points deviation from 2D App (mean position=4,3). On the other hand, students who held meetings on 2D App gave less importance to "Global commitment" (mean position=1,6) which resulted in a 0.8 point deviation from Metaverse (mean position=2,4). As a result, students in the Metaverse structured a deductive discussion focusing on the l-t view of the company and how to achieve a sustainable goal in the near future. In contrast, students in 2D environment focused more on the pre-reading material delivered with descriptions of the sustainable campaign and the product offered, thus relying on explicit documents.

Results from chi-square test showed a quasi-significant relationship regarding "Components" ($\chi2(5)=10.000$, $p=.075$) indicating an acceptable fit of Components within the hypothesized construct (H3 partly supported). On the other hand, results evidenced a non-significant correlation between the selected round (e.g., 1,2) and, respectively, "Circularity" ($\chi2(3)=.000$, $p=1.000$) (H3 not supported); "Responsible supply chain" ($\chi2(5) = 5.333$, $p =.377$) (H2 not supported); "Global commitment" ($\chi2(5)=4.667$, $p =.458$) (H4 not supported); "Strategic plan" ($\chi2(6)=6.000$, $p=.423$) (H5 not supported).

Table 3.b. Occurrence of ranking of *subjective/emotional* factors related to consumers' sustainability perception

Item	Media	Position					
		1	*2*	*3*	*4*	*5*	*6*
Pride	3D App	4	3	5	2	0	2
	2D App	3	3	2	2	0	5
Contentment	3D App	3	3	0	6	1	3
	2D App	1	3	5	2	3	1
Happiness	3D App	3	2	2	2	6	1
	2D App	1	3	4	2	4	1
Gratitude	3D App	0	0	4	4	2	6
	2D App	1	1	1	3	3	6
Inspiration	3D App	4	2	3	1	4	2
	2D App	6	0	1	5	2	1
Elevation	3D App	2	7	2	0	3	2
	2D App	3	4	3	1	3	1

In the second round (i.e., the ranking of emotions/ *subjective* factors), the Metaverse students appeared more proud regarding the sustainable product (mean position= 4.2) than the students in 2D App (mean position=3.5) with a difference of 0.7 points. The item "Inspiration", on the other hand, was rated less highly (mean position=3.7) than the respondents' in 2D technology (mean position=4.0). The chi-square test results indicated that the correlation's assumption between the variable "Gratitude" and Round (i.e., 1,2) was not violated ($\chi2(5) = 10.000$, p = .075) (H9 partly supported). On the other hand, the test showed a non-significant association with the other variables among which "Pride": ($\chi2(4) = 1.333$), p =.856) (H6 not supported); "Contentment": ($\chi2(5) = 4.533$, p = .475) (H7 not supported); "Happiness": ($\chi2(4) = 4.333$, p = .363) (H8 not supported); "Inspiration": ($\chi2(6) = 6.667$, p = .353) (H10 not supported); "Elevation": ($\chi2(5) = 9.000$, p = .109) (H11 not supported).

5. Conclusions

5.1. Theoretical implications

In the current context of fast-evolving emerging marketing technologies and tools to support marketers in the development of effective actions, the Metaverse and virtual reality might play

a significant role in facilitating customers' social communication (Laukkanen et al., 2022). The use of this new interactive setting enables the transmission of a greater deal of information, thus enhancing customers' emotions, attitudes, and behaviors towards the product (Wu & Whang et al., 2021; Fisher et al., 2008).

This type of virtual experience, also defined as "iMOT" or "Imaginary Moment of Truth" (Giorgino & Mazzù, 2018) encompasses all the virtual interactions that the consumer has with the brand through experiences, emotions, and needs that are satisfied in overlap with, or in substitution for the real ones. As a result, the rapid technological change, social change, and the proliferation of touchpoints have created the basis for evolving consumer decision-making processes and, in terms of business opportunities, have forced companies to reinvent and innovate (Giorgino & Mazzù, 2018).

As the adoption of true sustainability practices is today central to affecting individual perception and companies' operations (Amatulli et al., 2018; Lee & Lin, 2022), the paper highlights the presence of a differential effect when customers interact in a Metaverse/ 3D virtual reality environment against when they engage in group discussion in a 2D environments. In particular, evidence suggest that individuals form different priorities when they rank the relevance of *objective* and visible practices and of *subjective* responses and emotions related to sustainability stimuli.

According to Laukkanen et al., 2022, our results also emphasize the potential of the Metaverse, with its multisensory experience, to help consumers find it easier to process and internalize green information, leading to a deeper understanding of green consumption and encouraging them to make eco-friendly choices.

5.2 Managerial Implications

Managers can derive relevant implications as they can develop appropriate settings to engage customers and stimulate discussions on the elements that characterize perceived

sustainability of the brand and its products, for both *subjective/emotional* and *objective/functional* items.

Our results emphasized a significant influence of the Metaverse, with respect to the 2D platforms, on respondents' perceptions of relevance on two elements: "Components" and "Gratitude". 3D media setting might then be of help when developing a potential engagement plan for those two priority elements. We thus made a substantive contribution to the extant literature highlighting the efficacy of virtual reality in ranking the relevance of both the *objective* and the *subjective* factors of customers' perception.

Moreover, as "Gratitude" is the "capability of being thankful and appreciative towards the company and behind the product", this can be deployed to stimulate the perception of "Components", i.e., the perception that a Company is truly able to design products according to sustainable criteria (e.g., recycled, biobased, organic materials), utilizing a Metaverse setting. Furthermore, with regard to the other *objective* and *subjective* sustainability drivers, the results demonstrated that they are perceived equally across both media settings (2D/3D). Accordingly, managers could experiment with the 3D setting in their marketing actions to valorize *objective* elements as "Circularity", "Responsible supply chain", "Global commitment" and "Strategic plan", as well as *subjective* ones as "Pride", "Contentment", "Happiness", "Inspiration", "Elevation" without potentially hampering the impact on customers' perception. This could serve as a sign of innovation and complement more traditional dedicated spaces in 2D environments (e.g., on the company's official website) that foster the sharing of problems and solutions related to CSR practices via blogs, podcasts or crowdsourcing projects (Xu et al., 2016).

This could serve as a guideline for managers in selecting whether a 3D or a 2D touchpoint is more appropriate in conveying specific elements of the sustainability positioning, for potential customers who engage in fashion discussion through digital para-social interactions.

This would affect the development of effective marketing plans - one of the major challenges for marketers -, by identifying the appropriate balance between innovative vs. traditional touchpoints (Vannucci & Pantano, 2020), and between functional and emotional factors. Moreover, when the perception of sustainability is involved, the situation become more complex, as actions developed by high-end fashion companies are assessed by customers against woke-washing perception (Sobande, 2019). Finally, our research contributes to enriching the theoretical background of the fashion and sustainability industry by introducing a comparison of the impact of the Metaverse on customers' perceptions towards the brand and sustainability when developed during group discussion.

5.3. Limitations and Future Research

This study is not exempt from limitations that could also serve as recommendations for future research. First of all, the sample was restricted to 137 students, and in order to increase the validity of the outcomes, future research should enlarge the sample and expanding it to other socio-demo groups.

Secondly, the technology involvement and the related usage motivation were high for all the respondents; consequently, the study didn't consider cases with low technology experiences. Another issue that warrants further research is to collect information on different feelings about digital solutions, attitude toward technology, personal traits of respondents (Rammstedt et al., 2007), knowledge of high-quality fashion products, attitudes toward high-end Fashion products (McNeill et al., 2015), attitudes toward the brand (Sengupta & Johar, 2002), attitudes toward sustainable products (Wei et al., 2017), brand credibility (Ohanian, 1990) that could serve to understand potential mediating and moderating relationships and, accordingly, develop new theoretical model that can advance research and support business leaders decision making in high-end fashion.

Additionally, this research did not focus on a profound and careful investigation of the impact of the "setting" of the Metaverse rooms where the discussion was taking place. Researchers (and managers) could then investigate how to enrich their VR tools, sensory input, and interactivity (e.g., by working on Avatars) to enhance consumers' perception of sustainability and positive behaviors towards sustainable products during those 3D interactions. Finally, the validity of the results might be explored also in other industries to understand whether a common differential pattern exists on *subjective*/emotional and on *objective*/functional factors in different contexts when customers interact to form their opinion in the Metaverse vs. other touchpoints.

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Appendix

Appendix 1. Preliminary Survey

Item	Scale	References
Involvement with Technology	Technology appeals to me.	Kim, Haley, & Koo, 2009
	I am very savvy in computer technology.	Kim, Haley, & Koo, 2009
	When a new technology product comes out, I tend to buy it and try it earlier than others	Kim, Haley, & Koo, 2009
Attitude toward Technology	How did you feel after being exposed to technology: Interested, distressed, excited, upset, strong, guilty, scared, hostile, enthusiastic, proud, irritable, alert, ashamed, inspired, nervous, determined, attentive, jittery, active, afraid	Watson, Clark and Tellegen (1988)

Appendix 2. The Task

1 Please **discuss** in your group, reach an **internal agreement**, and **rank** in order of **importance** the factors that most **support** the **perception** that a high-end fashion **product** is **sustainable**

2 **Deliver the ranking** at the end of your group discussion

Further, you will be presenting in class, over the next weeks, the rationale beyond your decision

3 Your team leader is responsible of **clearly stating in sentences - with her/his voice - the chosen ranking** and the reasons of team's choices (i) at the end of the discussion, **(ii) inside the Metaverse and (iii) before exiting the session**

Consider the following list of factors, and rank them, according to the consensus you reach in your group, that most support the perception that a high-end fashion product is sustainable?

- **Components**: The company utilize low impact materials (e.g., recycled, biobased, organic, etc.)
- **Responsible supply chain**: The Company has a responsible management of the supply chain (e.g., respect for human rights and health and safety)
- **Circularity**: The Company is able to design products according to the circularity criteria (e.g., eco-design, ability to disassemble, disposal, sustainable inputs, etc.)
- **Global commitment**: The Company participate in global commitments (e.g., Just Transition, joining The Fashion Pact initiative, submission of UNGC, etc.)
- **Strategic Sustainability Plan**: The Company has a public Strategic Sustainability Plan with a public, quantitative and challenging commitment and targets

Consider the following list of emotions, and rank them, according to the consensus you reach in your group, that most describe the elicited emotions associated to a sustainable high-end fashion product

- **Pride:** occurs when a consumer feels superior compared to another person because of the product
- **Contentment:** is a feeling of quiet satisfaction generated by the product
- **Happiness:** an emotional state characterized by feelings of joy and fulfillment generated by the product
- **Gratitude:** involves being thankful and appreciative towards the company behind the product
- **Inspiration:** being mentally stimulated by the company behind the product to do or feel something
- **Elevation:** is a response to acts of moral beauty of the company behind the product in which individuals feel as though they have become less selfish, and they want to act accordingly

Appendix 3. The Data Collection Process

Step 1:
Registration of the ranking of each focus group

Step 2:
Calculation of the frequency of occurrence

Step 3:
Translation into interval scales data

Step 4:
Running of a chi-square test of independence