# Stimulating fast fashion consumers in-stores to slow down consumption with AI art

## Designing for socio-environmental impact

by Alice Biolchini

Stimulating fast fashion consumers in-stores
to slow down consumption with AI art:
Designing for socio-environmental impact

Alice Biolchini
(Author)

Msc. Strategic Product Design
Faculty of Industrial Design Engineering
Delft University of Technology (TU Delft)

Supervisory Team
Chair: Dr. Himanshu Verma
Mentor: Prof. Dr. Ir. Ruth Mugge

August | 2024

# **Stimulating fast fashion consumers in-stores to slow down consumption with AI art:** Designing for socio-environmental impact

Alice Biolchini

Master Thesis

# Executive Summary

The fast fashion industry faces critical challenges by overconsumption and overproduction driven by high demand, coupled with a lack of transparency in supply chains for many brands. This gap in transparency has led to limited consumer awareness regarding the environmental and ethical consequences of their clothing purchases. This research explores the potential of generative visual art in raising consumer awareness and changing perceptions within fast fashion stores. It serves as a proof of concept to test the impact of AI-generated visual art on engaging consumers, evoking emotional responses, and shifting mindsets related to overconsumption.

The project utilized theories from related works and elements from the Vision in Product (ViP) framework to develop the concept, which was tested through two experimental studies:
1. Pre-Study: This preliminary phase evaluated eight aesthetic combinations of color versus no color and zoom-in versus zoom-out compositions in AI-generated visual stimuli. The goal was to identify the most effective combinations for capturing attention and prompting reflection on fast fashion.
2. Main Study: This phase compared the impact of AI-generated images against traditional ad images. Participants went through the designed concept scenario and were divided into control and treatment groups. The control group viewed traditional imagery, while the treatment group was further divided into two sub-groups. Each sub-group was exposed to different AI-generated images, depending on their responses to two presented questions: one related to consumer interest in future fashion trends and the other on the latest trend update.

Key findings include:
- Pre-Study: Among 111 participants, black and white images with a zoom-in composition were most effective in capturing attention and prompting reflection on fast fashion.
- Main Study: Having 254 participants, AI-generated images had a more statistically significant impact, with T1 and T2 showing mean scores 13.94% and 7.33% higher than traditional images, respectively. Notably, an AI-generated image depicting a critical future fashion scenario—showing a woman surrounded by a pile of clothes in Amsterdam—excelled in capturing attention, enhancing cognitive engagement, prompting reflection, and encouraging behavioral change.

The main experimental results showed that the AI-generated image in Treatment 1 outperformed other conditions in six key dimensions: attention capture (15.1%), cognitive engagement (1.4%), reflection (23.3%), behavioral change (34.2%), mindfulness about clothing consumption (34.2%), and emotional response (9.6%). These results align with theoretical frameworks that emphasize the role of compelling visual stimuli in shaping cognitive and emotional responses. Additionally, the findings are consistent with evidence that computer-generated images can induce emotional reactions and be perceived as intentional, as if human-made art. The AI-generated imagery provided a fresh, critical perspective on future fashion trends, contrasting with the often optimistic portrayals found in traditional visuals. This approach effectively challenged conventional communication methods and prompted reflection on unsustainable fashion practices.

In conclusion, the research demonstrates that generative visual art can be a powerful tool in enhancing consumer awareness and driving change within the fashion industry. By employing creative and impactful visual strategies, it is possible to foster greater consumer perception, disrupt the cycle of overconsumption, and promote more sustainable fashion practices. This research can contribute to companies with ethical and sustainable policies, in communicating with consumers and potential new customers.

# Acknowledgments

I would like to deeply thank **my graduation team, Ruth Mugge and Himanshu Verma**, for embracing my research endeavor, their unwavering support and their continuous guidance throughout this journey. Your insights and encouragement have been invaluable on the theoretical and experimental aspects of my project, and to challenge me to think critically and help to refine my research approach, ensuring that my work was grounded in solid academic research.

**Ruth**, your expertise in sustainable consumer behavior shaped the theoretical background of these issues in my project. Your insights into consumer psychology, design, marketing scales for the experimental evaluation, and environmental impact deeply influenced the approach and enriched the project's overall direction. **Himanshu,** your research expertise on Artificial Intelligence, design, and social cognition was equally invaluable. Your guidance on the complexities of this area, generative models and technical advice on the sensors was essential for navigating the challenges that I faced, allowing me to explore solutions and refine my project. Together, your mentorship not only supported the successful completion of my thesis but also significantly contributed to my personal and academic growth. I am truly grateful for the opportunity to work with both of you.

I am profoundly grateful to **my parents, Ana Biolchini and Jorge Biolchini**, for granting me the once-in-a-lifetime opportunity to pursue my studies in the Netherlands. Your loving support and thoughtful exchanges throughout the thesis process have been a cornerstone of my success.

**To my mother, Ana,** your artistic background and creativity have always been a source of inspiration for me. Your passion for art deeply influenced my approach to this thesis, and having you as a role model encouraged me to explore the intersection of AI and art with greater enthusiasm. **To my father, Jorge**, thank you for your dedication and for being there to discuss ideas and provide valuable feedback whenever I needed it. Inspiring me as an academic role model, your insights and encouragement were instrumental in helping me stay focused and refine my work. Your collective support, both practically and emotionally, has been invaluable to me on this journey. I couldn't have achieved this without you.

I would like to extend a heartfelt thank you to **my friends** for their invaluable support throughout this journey. Whether it was helping me take my mind off the thesis when needed or simply being there to listen and share ideas, your presence made a significant difference. Just talking things through with you often helped me make sense of complex thoughts and challenges.

I am especially grateful to those who participated in my experiments and shared them worldwide. Your willingness to be involved and support my work, even in the most challenging moments, was incredibly meaningful. A special thanks to those of you who worked alongside me at various spots around the campus—whether at IDE by the sofas, the platvorm "islands", or the 2nd floor "aquariums", at the library with the screens, at X in between sports time, or at Echo with the feeling of the forest coming inside. Your companionship made the process smoother and less lonely. Seeing your familiar faces and sharing those moments of work and relaxation together was a great source of motivation and camaraderie. Your support made a real difference, especially during our summer break. Thank you for being such an integral part of this experience.

# Reading Guide

*Dear reader,*

*Before you dive into this report, let me give you a quick tour to make your journey smoother. This report is divided into three dynamic sections—INVESTIGATING, DESIGNING, and VALIDATING—each employing different methods to drive its development. Keep in mind that these sections are interconnected, with insights from one flowing into the next, creating a cohesive and comprehensive project (for more details, check out 1.3 Project Outline).*

*To enhance your reading experience, each section mirrors a consumer's journey through a fast fashion store. Imagine starting outside the shop: this corresponds to the exploratory phase of the research. As you "window shop," you'll dive into initial findings and concepts. Stepping inside the store and browsing the aisles parallels the investigation phase, where detailed analysis unfolds. Crafting your clothing selections in the store where you choose what clothes you desire mirrors the designing stage, where ideas take shape. Trying on clothes in the fitting room reflects the validating phase, where experimentation and testing occur. Finally, checking out symbolizes the evaluation of the research progress. As you exit the store, you'll see how these phases come together to form a comprehensive conclusion.*

*Enjoy the exploration!*

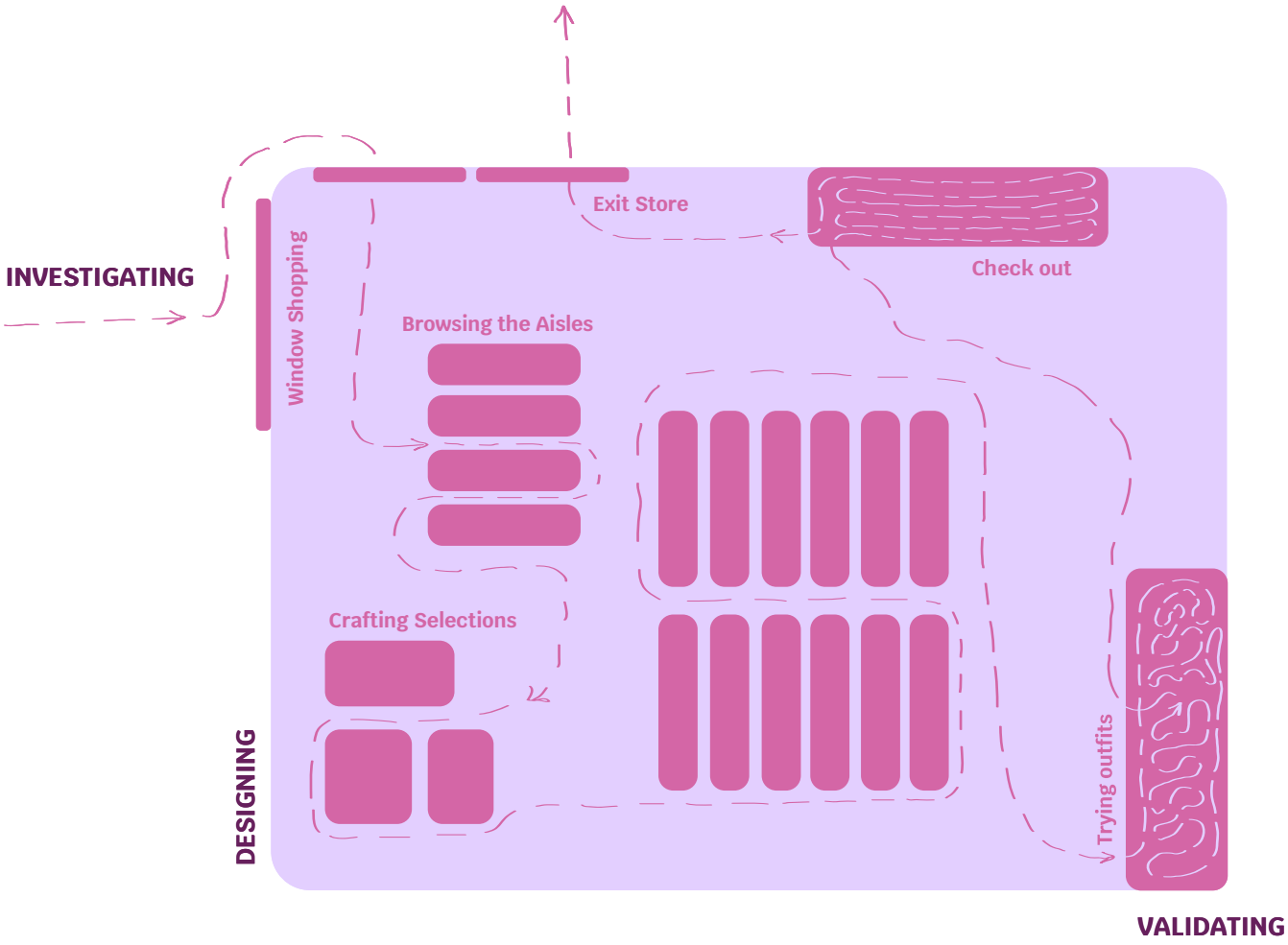



*Illustration based on the typical store layout for retail stores.

*The INVESTIGATING section includes two chapters. Chapter 2 is dedicated to exploring the Related Works regarding the topics investigated, while Chapter 3 focuses on the aspects related to The Consumers and their behavior within fast fashion stores.*

*The DESIGNING section, covered in Chapter 4, details the development of the research concept and reflects the process of curating and designing future interventions.*

*The VALIDATING section is dedicated to testing the concept to answer the research question. Chapter 5 examines the experiment on selecting image features that align with the research objectives, and Chapter 6 compares AI-generated images with traditional images to assess their effectiveness in grabbing attention and reflection on choices.*

*Finally, Chapter 7 discusses the findings and relates them to the existing theories, while Chapter 8 summarizes and concludes the report.*

# Contents

CONTENTS

DESIGNING

## Chapter 4. The Designed Experience



VALIDATING

## Chapter 5. Experimental Studies



## Chapter 6. Discussion



## Chapter 7. Conclusion

# A

## Accessories
Items used to complement or add to the clothing to style an individual's outfit. Enhances identity and personality. These include hairbands, jewelry, scarves, eyewear, gloves, bags, hats, ties, and tights.

## Apparel
Entire spectrum of clothing and accessories, available for individuals to wear. Has functional and aesthetic purposes.

# E

## Eco-friendly practices
Actions, methods or procedures that are not harmful to the planet.

# G

## Greenwashing
A way to convey false impressions or provide misleading information about the sustainability practices of a business or its services.

## Green products
Products made from biodegradable or recyclable materials, designed to last longer and under fair labor practices.

# C

## Clothing
Garments worn by individuals to cover and protect the body. Has primarily functional purposes. Clothing items include underwear, shirts, tops, shorts, pants, skirts, dresses, jackets, sweaters, blazers, jumpsuits, socks, and shoes.

# F

## Fast fashion
A business model that offers fashionable (trendy clothes) at an affordable price for the mass market.

## Fashion retail
Businesses that sell clothing and accessories directly to customers in physical stores. Also known as fashion brands.

# M

## Mass market
Term used for a broad market of consumers with varied demographics and preferences, typically targeted by products designed for high-volume sales, such as fast fashion.

# R

**Responsible Fashion**
An approach to clothing production, distribution, and consumption that aims to minimize the negative impact on the environment, society, and economy. Also known as sustainable fashion or ethical fashion.

# V

**Value chain**
A set of activities that an organization carries out to create value for its customers. The way in which it performs its activities determines costs and affects profits; a value chain model helps organizations understand their sources of value.

# T

**Textile**
Term used for all kinds of raw materials (fibers) and the finished materials (fabrics) used in producing clothing.

**Transparency**
Quality of making information clear, accessible, and understandable to stakeholders. In this report, transparency refers to revealing critical insights about the environmental consequences of the fast fashion industry through visual imagery, promoting awareness and accountability in consumer behavior.

**Trends**
Patterns, styles, and designs in society emerged from influences such as runway shows, celebrity endorsements, cultural movements, or social media, shaping the fashion industry's offerings and consumer choices.

# Glossary

# Chapter 1

## Context

This section establishes the foundation for the research project, starting with defining the context and framing the problem. It delves into the project's outline, illustrating the step by step process followed and the methods and tools used during each step of the way.

**"Even though we can see it from space, the garment graveyard is still a silent crisis. It is a huge pile of low-quality or damaged garments inherited from the fast-fashion market in the US, Europe and Asia. Most garments take up to 200 years to decompose. The emergency is also climate-related."**

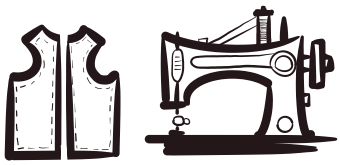
Ángela Astudillo,
co-founder of Desierto Vestido.

# 1.1 Fast fashion and its industry

Fast fashion is a business model that caters to the mass market, appealing to people of all ages, incomes, and cultures. It belongs to the fashion industry, which belongs to the clothing industry and the apparel industry.

Let's understand these different sectors:

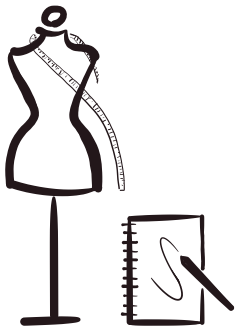
**Textile industry** focuses on the production of natural and synthetic fibers, spinning them into yarn, weaving or knitting them into fabrics, and finally finishing the fabrics for use. It includes apparel, home furnishings and industrial textiles. And provides materials needed for the other industries.



**Apparel industry** encompasses the manufacturing processes practical aspects involved in converting textiles and accessories into finished items, as well as their distribution and retail. It emphasizes the technical aspects of cutting, sewing, and assembling garments, with a focus on mass production.

**Clothing or garment industry** is often used interchangeably with the apparel industry as it also focuses on producing and selling, but encompasses only clothing. The term is often used more generally and can sometimes refer to the broader category of garments without emphasizing the operational or technical aspects.

**Fashion Industry** encompasses both the creative and production aspects of clothing. It is a subset of the broader clothing and apparel industries, centering on the design phase, which includes elements such as trend forecasting, market research, creativity, sketching, and marketing, among many other activities. It is characterized by its focus on aesthetics, style, and consumer preferences, and creative expression.



The fashion industry has a five-layered market segmentation (Fig.1), with the mass market being the one most at the bottom, intended to reach the maximum number of people by providing trendy fashion at affordable retail prices (fast fashion). **The unique selling point of fast fashion is the quick turnover**, bringing runway show outfits to stores for the general public in record time. This is **achieved through a decentralized supply chain**, with factories and manufacturers located worldwide, contributing to low production costs. The i**ndustry prioritizes quantity**, leading to diminished garment durability. As a result, clothing can be sold at the cheapest price when it reaches the store. This market segment (Fig.1) exponentially contributes to pollution, making the **fashion industry the third-largest pollutant globally** (Climate Trade, 2023), primarily due to its substantial greenhouse gas (GHG) emissions and its impact on the global carbon footprint (Climate Trade, 2023; Andreadakis et al., 2023). Climate Trade also mentions that this ranking reflects how the industry is responsible for 8-10% of humanity's carbon emissions – more than all international flights and maritime shipping combined. Besides that, it also causes water and land pollution.

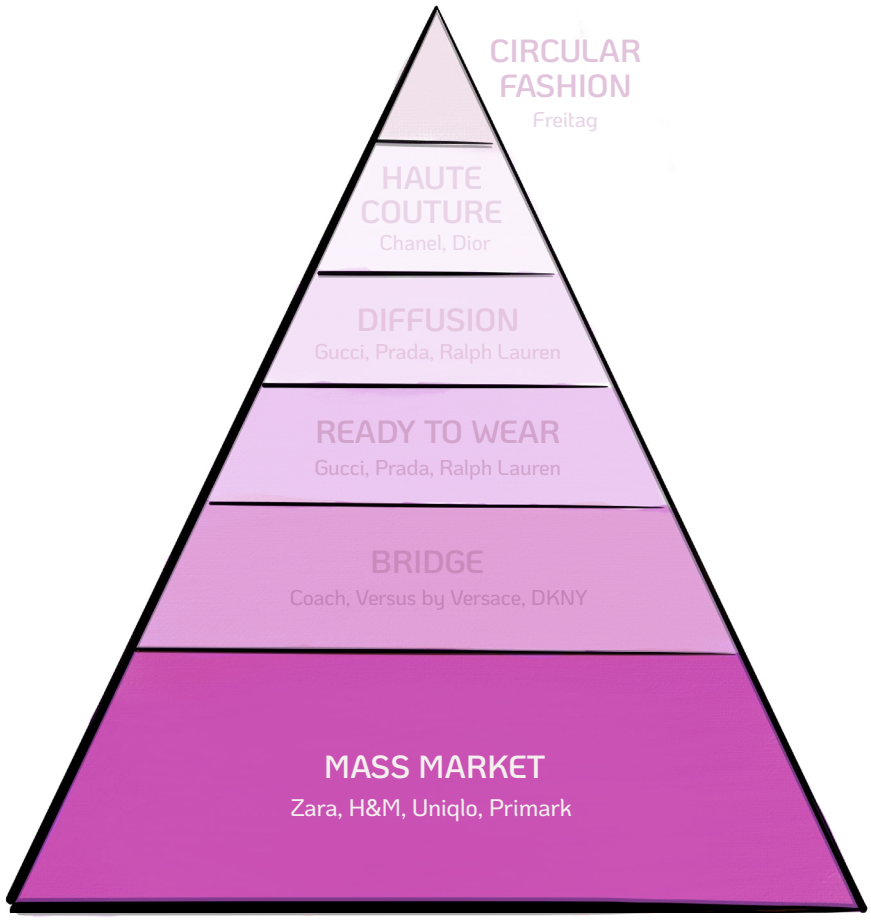



*Fig. 1. Market Segmentation with addition of the circular fashion market on the top. Adapted from Fashion Pyramid (Doeringer & Crean, 2005)*

The fast fashion business model emerged around the late 20th century and became widely recognized and popular in the early 2000s (Daystar, J. et al., 2019; Cachon, G. et al. 2011) with Zara, H&M, and Forever 21 leading the way. Today, fast fashion further capitalizes on collaborations with celebrities (Primark, 2024), to enhance the appeal of clothing offered, tapping into fans' desires to adopt the styles of their favorite stars. This aligns with Maslow's Hierarchy of Needs (see ***Appendix B*** for more details), addressing levels 3 to 5—belonging, esteem, and self-fulfillment. Within fast fashion, the pursuit of these needs drives individuals to connect with the community, social status, and identity associated with their admired figures. Regardless of cultural background, if individuals are fans of a celebrity or a trend, purchasing items in that style or color can fulfill their desire to belong and align with that group.

Our behaviors are deeply influenced by the narratives we construct from our sensory experiences, with **vision playing a significant role in shaping perceptions and interactions**. This dynamic is driven by marketing campaigns that disseminate information and encourage consumers to purchase more goods, establishing **a culture where overconsumption becomes the norm**. In Europe, these campaigns are strategically placed on billboards, public transport, and shopping centers, as well as through digital and print media, to maximize visibility and influence. The influence of compelling visuals and strategic messaging has perpetuated this trend over the years, increasing the demand for fast fashion clothing in Europe's millennials (Johnstone, L. et al., 2022). By **understanding how visual stimuli impact consumer perceptions, we can better address the issue of overconsumption, a critical focus of this project**.

# 1.2 Problem Framing

Known as the excessive purchase of goods, **overconsumption is closely linked to overproduction**, a phenomenon that originated with mass production during the Industrial Revolution. Following World War II, **rapid population growth and economic expansion led to a culture of buying more for less**. This **shift created a vicious cycle** (Fig. 2) within the fast fashion industry where increased consumer demand fuels higher exploitation of resources and production rates, which in turn drives even more consumption and quick discarding. The overproduction contributes to carbon emissions and different sorts of pollution, from air to chemicals to water and waste, which brings to the surface another major issue: **environmental degradation** (Grayce, 2021; Payne, 2022; Stein-Rachmil, 2024).

In Europe, around 26 kilograms of textiles are used and 11 kilograms of those are disposed of each year, with about 87% being either incinerated or sent to landfills (European Parliament, 2024). Less than half are collected for reuse or recycling, and only 1% of used are recycled into new clothes (European Environment Agency (EEA), 2024). EEA (2024) further emphasizes that an estimated 4-9% of all textile products put on the market in Europe are destroyed before use, amounting to between 264,000 and 594,000 tonnes of textiles destroyed each year. This is known as textile product destruction, the 'take-make-waste' approach, where consumer products are never used for their intended purpose (EC, 2022) and are willingly disposed of (Roberts et al. 2023), highlighting the **inefficiency of current linear production-consumption systems which cause air, land and water pollution**.


*Fig. 2. The vicious cycle of overproduction and overconsumption within the fast fashion industry, designed by author.*

The overestimation of consumer demands (Roberts et al., 2022) can be caused by not understanding what consumers desire. Since fast fashion brands have a diverse set of products ranging from styles, colors and sizes, and seasonal differences (Elia, 2019; Tanaka et al., 2019) to cater for the diverse set of audience and giving them freedom of choice, it is hard to predict how much quantity will be sold. Geographical variations in consumer behavior also make sales forecasting difficult. For physical stores, these challenges are compounded by space limitations, influencing brands to discard unsold items to make room for new merchandise (Tanaka et al., 2019). **With the lack of knowledge of consumer demands, fast fashion brands tend to prefer overstocking which takes a toll on unethical practices of labor and resources**, as garment workers work a lot in factories under pressure, to satisfy brand

demands. Specifically in developing countries, workshops face issues related to labor rights and occupational health, including low wages, long work hours, unsafe working conditions (Bray, 2009; Bianchi and Birtwistle, 2010; Blanchard, 2013; UNEP, 2018; WRI, 2019), and even instances of forced labor or child labor (Pathak et al., 2023), despite such practices being illegal in most countries (Project Cece, 2023). Workers often endure poor ventilation, exposure to hazardous chemicals, and inadequate safety protocols, leading to health risks and workplace accidents (Brick et al., 2018).

In parallel to the unethical practices to increase production, **information gets lost in the process**. With a number of factories globally producing garments for different fashion brands and extensive import-export activities (Fashion Week Online, 2024), the **decentralized production and international distribution network, makes it challenging to track and manage textile products throughout their entire lifecycle**. The geographical and emotional distance between consumers in Europe and garment workers in countries like China, Bangladesh, India, and Vietnam contributes to a sense of disconnect and othering. **While most people may have some awareness that cheap clothing comes at the expense of others, they often choose to ignore or distance themselves from this uncomfortable reality**. When perceiving others as part of our in-group, we are more capable of recognizing their humanity and individuality. Since Fashion Revolution, a not-for-profit organization, launched its inaugural Fashion Transparency Index in 2016, the number of brands lacking supply chain visibility in the Index has surged from 40 to 250 in less than 10 years (Fashion Revolution, 2023). While some brands are increasingly taking responsibility for managing their operational systems and improving transparency, many still lack the necessary oversight, influencing their selection of manufacturing partners (Wren, 2022).

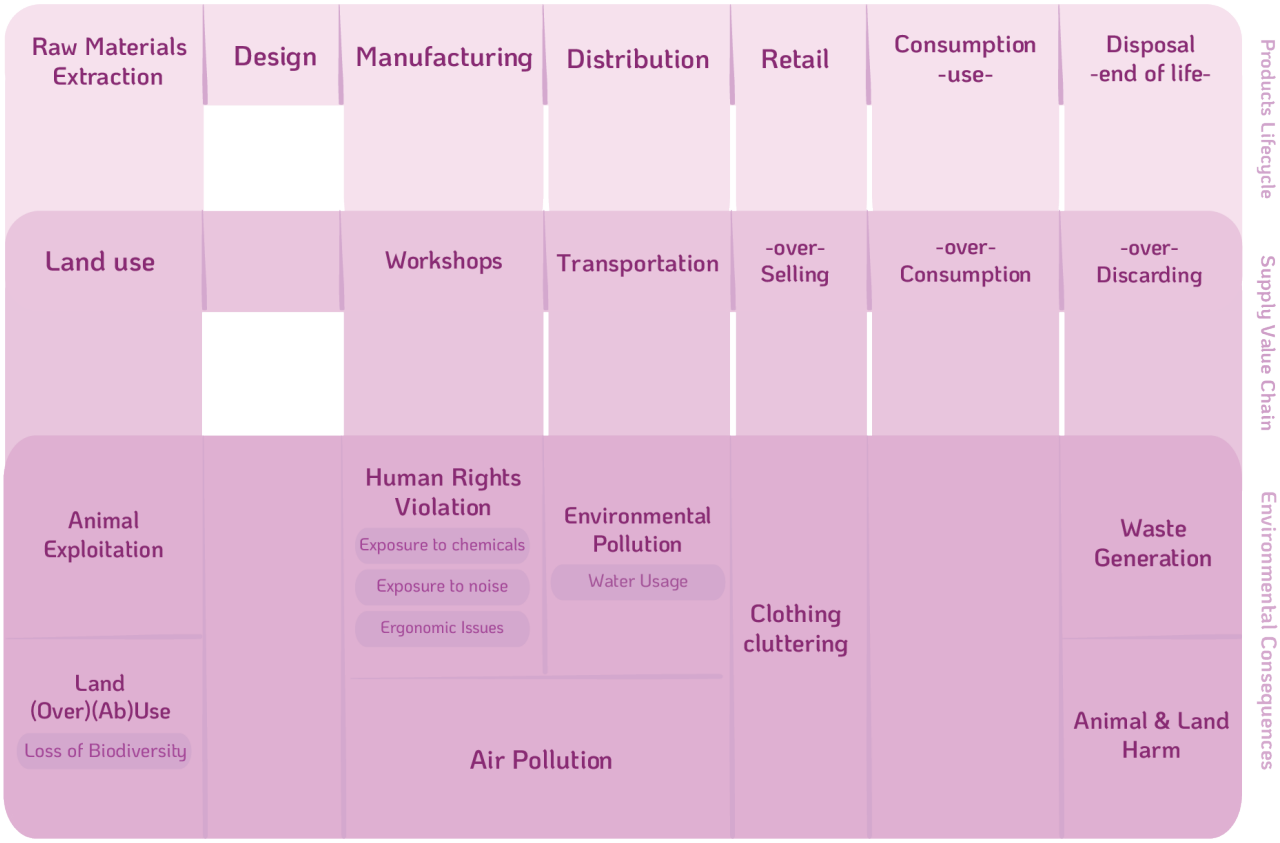



*Fig. 3. Supply chain vs. product lifecycle system, designed by author.*

From 2024, EU policymakers decided to introduce a direct ban on the destruction of textiles and footwear with exemptions of 6 years to medium-sized companies and complete exemption for small and micro-sized companies. Article 20 of the proposed Ecodesign for Sustainable Products Regulation (ESPR) mandates transparency in reporting discarded unsold products. This shows efforts of hard policy intervention to improve accountability and to stimulate change in the industry, but the effectiveness of this measure in reducing overall waste remains uncertain. **Increased operational transparency, as required by this regulation, can provide consumers with more information about the fashion industry's processes, potentially enhancing their awareness** of environmental impacts.

Research across various fields highlights the **importance of transparency in building trust and enhancing communication**. For instance, blockchain technology in banking shows that transparency through Distributed Ledger Technology (DLT) reduces fraud and builds customer trust (Udeh, E. 2024). Similarly, studies in corporate and science communication emphasize that message transparency boosts public trust and attitudes towards companies handling sensitive information. Similarly, in the fashion industry, transparency regarding labor practices, working conditions, and environmental impacts is vital. Such information is sensitive as it impacts workers' rights and environmental concerns directly. Increasing transparency in these areas can enhance consumer awareness, build trust, and encourage more responsible consumption practices.

**Lack of transparency can be associated with lack of awareness from consumers regarding the consequences of their consumption habits, preventing informed choices and perpetuating overconsumption.** Without clear information on the environmental impact of fast fashion, consumers may buy excessively without considering the broader effects of their purchases. Assisting to increase awareness of correlations between consumers' decisions and negative impacts on the environment, might help to recognize the need to change their buying behavior. According to Terrelonge (The Interline, 2023), confronting the human impact of purchasing decisions can be uncomfortable, as it challenges individuals to acknowledge their role in perpetuating injustices. This discomfort, whether from reluctance to change or feeling overwhelmed, is a crucial step toward making more conscientious choices and driving positive change in the fashion industry.

To contribute to transforming this vicious cycle, **this project was proposed to raise awareness about the true cost of fast fashion and trigger more responsible consumption**. The next section demonstrates how the thesis took its shape to enhance communication between fast fashion brands and their consumers towards triggering perception change of their purchases and the industry's consequences.

# 1.3 Project Outline

**This project aimed to develop a proof of concept to influence consumer perceptions within the fast fashion industry by evaluating the impact of AI-generated and traditional visual art images**. The core of the project was to assess how images prompt consumers to reflect on their purchasing choices. An integrated approach where artworks visually depict the interconnected stages of the fashion industry, emphasizing the socio-environmental consequences of overconsumption (see Fig. 5), prompt consumers to reflect on their purchasing choices. By highlighting these consequences, **the project aimed to encourage more responsible consumption and promote greater accountability** within the fast fashion sector, ultimately aiming to build trust between consumers and brands.

Given the complexity and opacity of the fast fashion supply chain, the **project focused on theoretically and conceptually designing an engaging experience to stimulate consumer awareness and perception.** By utilizing visual content to highlight the environmental impact of overconsumption, the project sought to bridge the communication gap and inspire a shift in consumer mindset toward more sustainable practices.

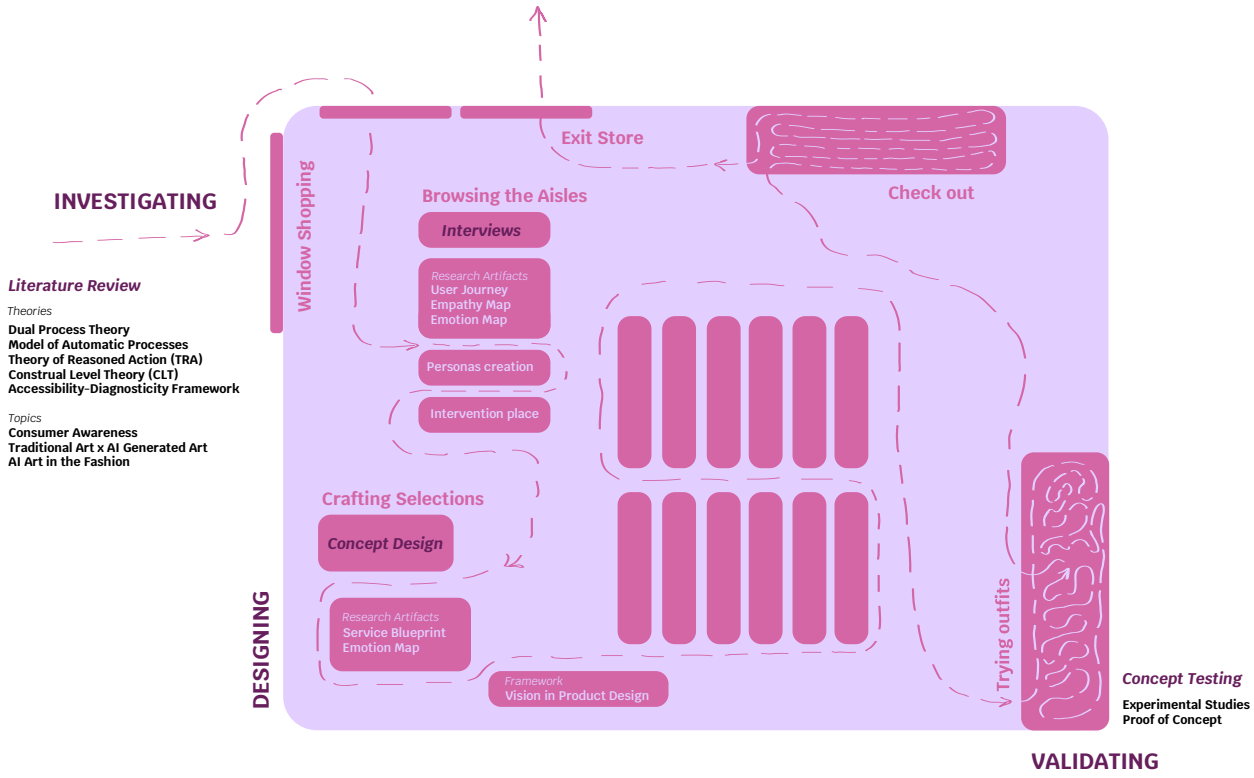



*Fig. 4. An overview of the research project pathways, designed by the author. Main stages comprising methods, highlighted in gray.*

The literature research aimed to understand previous studies on sustainable consumer behavior, visual art for socio-environmental impact, and artificial art. The goal was to comprehend consumer decision making, environmental consciousness related to the fashion industry, habits on clothing consumption, consumer attitudes in shaping intentions and behaviors, strategies used to influence consumer decision-making, aesthetic perception and emotion evoking of traditional and artificially generated artworks, visual art in stimulating consumer engagement, and applying the insights in the development of the design concept for this project.

The interviews served for identifying the target audience, understanding the users experience and creating the personas, for designing elements of the concept. The Designed Experience chapter was focused on designing the concept, guided by the framework ViP (Hekkert, P., 2011). Finally, the Validation stage consisted of quantitative experimental study to validate the concept and get proof of its components. This provided an iteration on the design solution to be performed. For detailed information on the methods and outcomes of these phases, refer to each of the chapters.

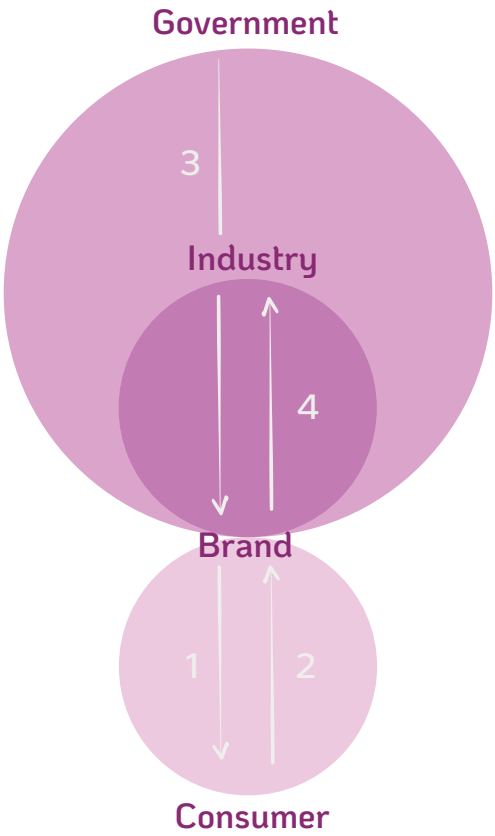



*Fig. 5. Proposed integrated approach towards moving to a more responsible fashion industry, designed by author.*

To tackle this project, **an integrated approach from top-down and bottom-up perspectives was proposed** (Fig.5), aiming to unite efforts that traditionally operate separately.

1. **Brand establishes a deeper connection with consumers** and within the store triggers consumers to become aware of reality. Brands communicate their own sustainability goals, achievements, and challenges transparently.
2. **Consumers become aware of purchase habits**, are triggered to making informed choices, changing consumption patterns, and may advocate for moving the industry towards sustainability.
3. **Brands become more aware of their own actions** as they comply with the government policies and regulations.
4. **Industry is influenced by brands adopting this movement**. Adoption of sustainable practices across the industry is accelerated.

# 1.4 Project Alignment With Society

This approach directly aligns with the increasing awareness towards the impact of fashion on the European market and the environment. This shift underscored the focus of the present research on altering consumption patterns. The importance and necessity of this project are evident from Figures 6 and 7, which illustrate its relevance. Figure 6, sourced from the 2023 United Nations Environment Programme (UNEP) report, identifies **three key priorities for driving systemic change in the textile value chain, with minimal focus on shifting consumption patterns**. This emphasizes the critical need for the current project. The UNEP report also delineates nine building blocks (Figure 7) essential for realizing the priorities, highlighting this study's alignment with addressing issues of textile overconsumption and overproduction (building block number 2). Furthermore, the project is closely aligned with SDG 12: Responsible Consumption and Production, emphasizing sustainable practices across the entire production and consumption cycle.

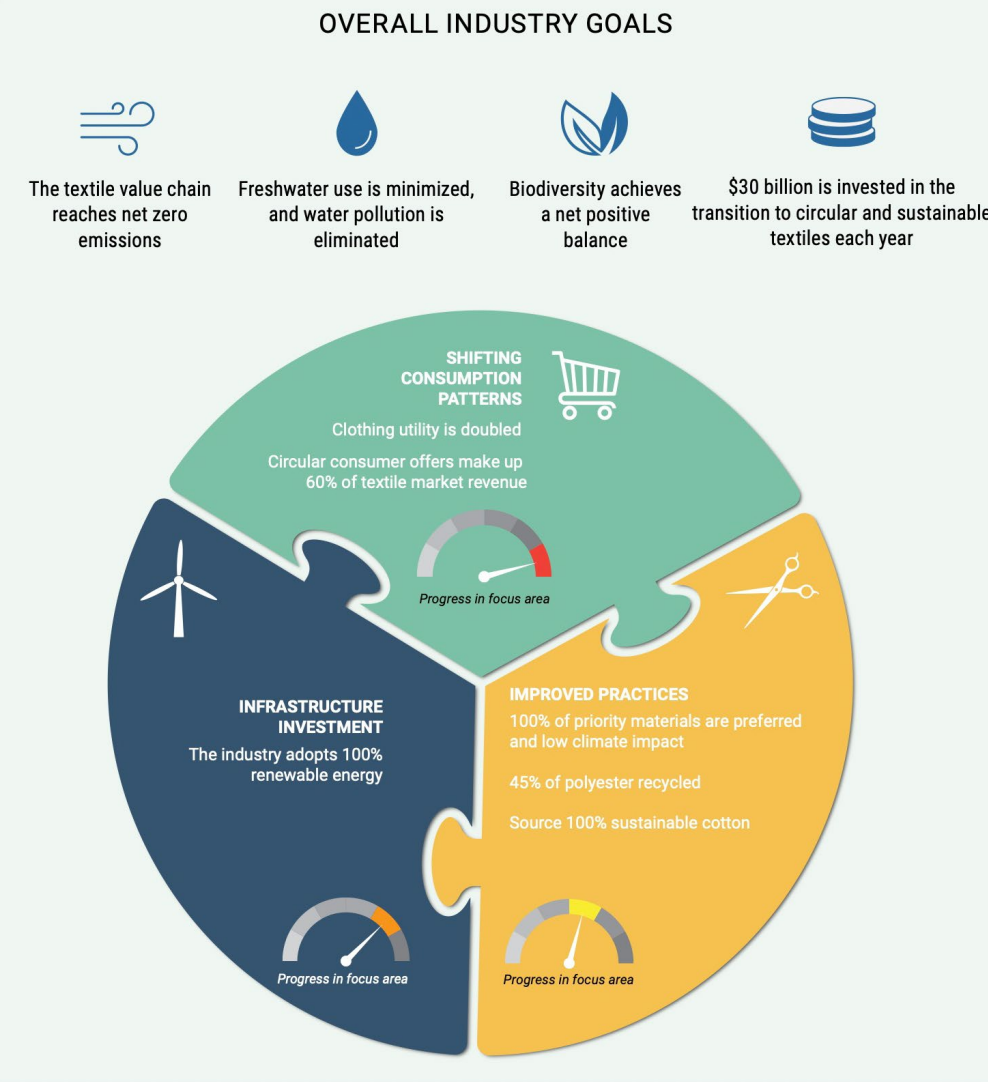
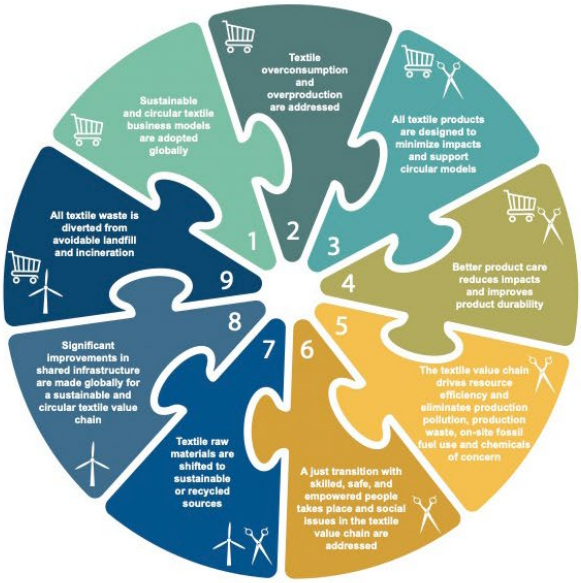



*Fig. 6. Quantified industry goals for a sustainable and circular value chain, taken from the United Nations Environment Programme (UNEP) report, 2023.*




**Executive Summary Figure 3:** Nine building blocks needed to deliver the three priorities

| | | |
|---|---|---|
| Shifting Consumption Patterns | 1 | **Sustainable and circular textile business models are adopted globally.** This requires a significant shift in perception of what 'value' means for consumers, brands and retailers. The focus must be placed on shifting the market and business revenue away from linear models towards circular models that have demonstrated impact reduction in both production and use phases, or focusing on selling experiences or other non-material goods rather than physical products. |
| | 2 | **Textile overconsumption and overproduction is addressed.** A significant decrease in unnecessary consumption is required, particularly in developed countries. This can be achieved through a combination of increased clothing utility (how long a product is used) and shifting consumer norms and aspirations towards lower consumption through engagement with the social and emotional aspects of behaviour. Reducing unnecessary production will be important for brands and retailers, and can be achieved through improved stock and demand management, as well as exploring new models such as on-demand production. |
| Shifting Consumption Patterns + Improved Practices | 3 | **All textile products are designed to minimize impacts and support circular models.** Design must be informed and intentional. Improved data and feedback loops will be critical to take into account knock-on effects of design at each stage of production, use and end of use. Products should be designed to consider the relevant circular business model (e.g. durability for rental), and with the assumption that they will be an input to closed loop recycling. |
| | 4 | **Better product care reduces impacts and improves product durability.** The consumer 'use' phase for textiles has chemical, energy, and water impacts, alongside microfibre and product durability issues. However, most textile brands do not include the consumer use phase in their impact evaluations and there are no large initiatives working on this phase. There is especially a need for more data on product care impacts and behaviour, also considering that consumers are diverse and global. |
| Improved Practices | 5 | **The textile value chain drives resource efficiency and eliminates production pollution, production waste, on-site fossil fuel use and chemicals of concern.** Textile production sites – especially wet processing sites – require major support and investment to substitute machinery and apply circular production methods. This is particularly important for sites beyond tiers 1 and 2 of large multinational brands, or production countries without strong policy enforcement on cleaner production. |
| | 6 | **A just transition with skilled, safe, and empowered people takes place and social issues in the textile value chain are addressed**. This includes collaborating with less-developed countries and previously marginalized communities, including – but not limited to – women, young people, indigenous and tribal peoples and persons with disabilities, which will help to avoid significant trade-offs and negative consequences. |
| Improved Practices + Infrastructure Investment | 7 | **Textile raw materials are shifted to sustainable or recycled sources**. There is a need to rapidly scale new and more sustainable production and cultivation practices for virgin raw materials, and to mainstream fibre-to-fibre recycling through improved practices as well as investment in waste management systems and infrastructure. |
| Infrastructure investment | 8 | **Significant improvements in shared infrastructure are made globally for a sustainable and circular textile value chain**. This includes renewable energy, waste management and water treatment, as investment in shared infrastructure is essential to unlock the potential of individual actors to make changes in their own systems. |
| Infrastructure Investment + Shifting Consumption Patterns | 9 | **All textile waste is diverted from avoidable landfill and incineration**. Shifting consumer behaviour and global dynamics are required to avoid the need for landfill and incineration; for example, through circular solutions that reduce waste outputs. Solutions are needed to avoid shifting responsibility for waste disposal, such as trade of used textiles to locations that cannot use them and lack the infrastructure to adequately process textile waste. |

*Fig. 7. Detail on nine building blocks for delivering three priorities for developing a sustainable and circular value chain, taken from the UNEP report.*

Collecting and disclosing impact data is a powerful action that can serve as a benchmark for the future, allowing brands to set goals, design strategies, and make public commitments to improve over time. Every brand that ameliorates its transparency also raises the standards for the fashion industry as a whole. From the 2021 Fashion Transparency Index: "The public disclosure of credible, comprehensive and comparable information about fashion's supply chains, business practices and impacts on workers, communities and the environment is crucial to driving systemic change. Transparency enables investors, lawmakers, journalists, NGOs, trade unions, workers and their representatives to hold brands and retailers to account."

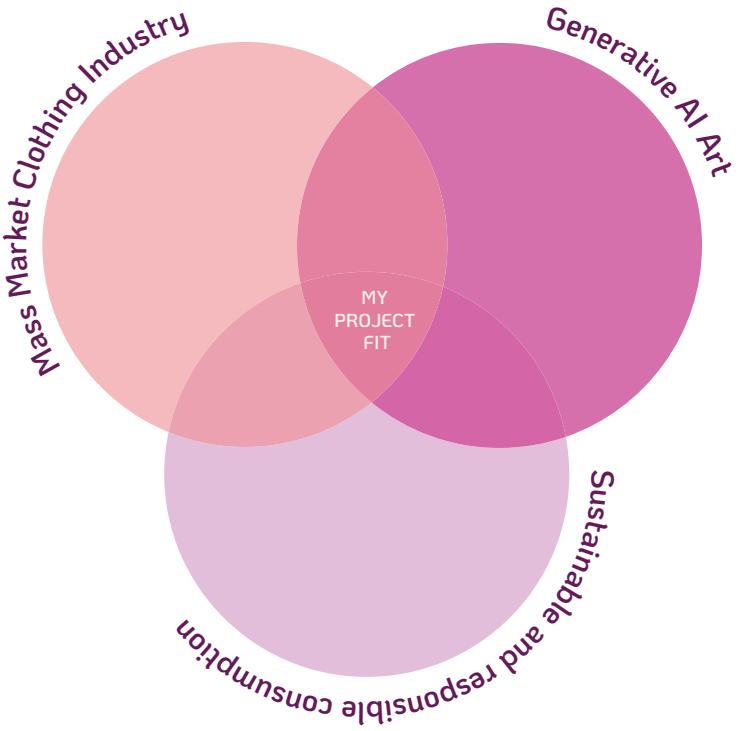



*Fig. 8. The fit of disciplines in this project, designed by author.*

The core essence of this project—the ambition to transform people's perceptions of the mass market clothing industry through generative AI art and promote sustainable and responsible consumption—is demonstrated in Figure 8. **Aiming to reconcile the divergent forces of consumer demand, environmental responsibility, and artistic expression, the project embarks on a journey to foster a relationship between aesthetics, socio-environmental ethics, and innovation**. The project discourages impulse purchases by fostering awareness around the consequences of unnecessary buying, aiming to shift consumer habits towards more thoughtful and intentional shopping.

INVESTI

# IGATING

In this section, you will dive into two parts:

**Part 1: Window Shopping**
Here, you will explore the related works that were studied for this project. You will gain perspective on the broad context and discover the gaps within the existing knowledge fields. You will be introduced to theories from various authors, which were used to develop the concept and later applied in the composition of the experiments.

**Part 2: Browsing the Aisles**
This part is designed to help you understand the people targeted by this project. You will learn about the main fast fashion consumers, their behaviors and motivations, and the specific user group the concept aimed to reach.

# Chapter 2

# Related Works

Time to go window shopping! Whenever people are out on the streets, they involuntarily glance at the windows of shops. It doesn't matter the industry or type of building; people even take a peek into homes. This is an inevitable part of daily human life. Within the scope of this project, metaphorically translating the meaning of window shopping into design research involved conducting literature research in order to understand what works exist on the subject.

# 2.1 Method

The literature research conducted involved reviewing studies based on experiments, surveys, and observations regarding this research thematic field. A total of six databases were utilized to collect relevant research: ResearchGate, Elsevier, Wiley Online Library, JSTOR, Emerald Insight, and NIH PubMed.

The research queries used in each repository comprised thematic interfaces between the subjects researched consisting on the following ones:

"sustainable fashion" AND "ethical fashion"
"responsible consumption" OR "sustainable consumption"
"sufficient lifestyle" AND "sufficiency" AND "environment"
"environmental impact" OR "environmental sustainability"
"environmental impact" AND "visual art"
"environmental impact" AND "generative ai"
"generative ai" AND "neuroaesthetics"
"environmental impact" AND "neuroaesthetics"
"environmental impact" AND "sufficiency"
"AI art" AND "fashion"

For further view on themes identified for the research, visit *Appendix B*.

While searching for these terms in each database, there were fields to select language, open access, and document type. Studies were excluded using the following exclusion criteria: publication date before 1900; published in languages other than English or Portuguese; having only qualitative study designs; conducted outside of Europe unless they offer highly relevant insights or methodologies that can be adapted to the European context; where the full article is not publicly available or accessible through TU Delft; book chapters and dissertations were also excluded, unless they provided critical information for the current research; and present in non-academic sources, specifically opinion pieces, and blog posts. News articles, executive reports were prioritized.

For a detailed view of the exclusion criteria, the reasons for including specific documents, and the number of records collected per database, please refer to Figure 9. The PRISMA framework was utilized to mitigate bias and ensure the reproducibility and transparency of the research process.

The exploration extended beyond the fashion industry to other sectors, using fast fashion as a lens to draw insights for the next chapters. **Given the frequent clash between impulse buying and environmental concerns in fashion, it's crucial to first understand consumer behavior**. To design effective interventions, let's dive into how we can prompt perception change among consumers.

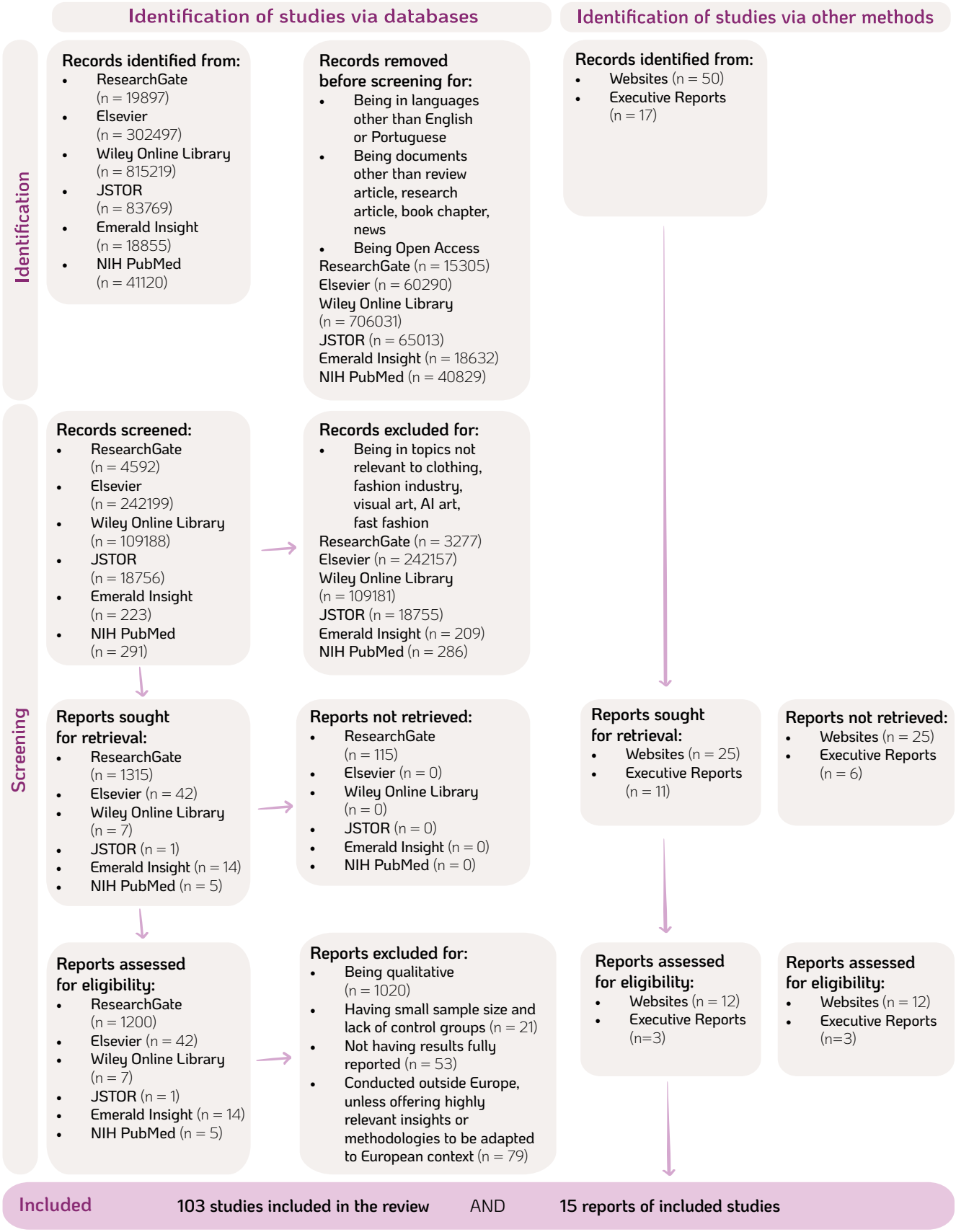



*Fig. 9. Exclusion criteria used to select the studies for the project, using PRISMA. Total amount of articles retrieved 13th May 2024.*

# 2.2 How to Prompt Perception Change

## 2.2.1 Decoding Fashion Decisions

The consumer mind behavior related to apparel products is associated with acquisition (purchasing), maintenance (keeping, using, and care) and disposition of clothes (everything after the primary owner's use) (Jacoby, 1976). **This project focused on the consumption stage** (Fig. 10), specifically addressing the decision-making process involved in buying clothing items. Previous studies focused on acquisition, include insights on consumer preferences, motivations, and decision-making processes, such as brand loyalty, product attributes, pricing strategies, and the influence of marketing and advertising. Acquisition stage insights on consumer preferences involve understanding what types of products, styles, or features consumers prefer to tailor offerings for achieving their needs. Motivations can range from functional needs (e.g., durability, comfort) to emotional desires (e.g., status, self-expression). **Decision making processes depend on how consumers identify what they want**. Within emotional desires, it is also necessary to study the relationship with the values of the product, which include environmental impact, ethics in production, and company values. This study focuses on these aspects that also influence the decision-making process.

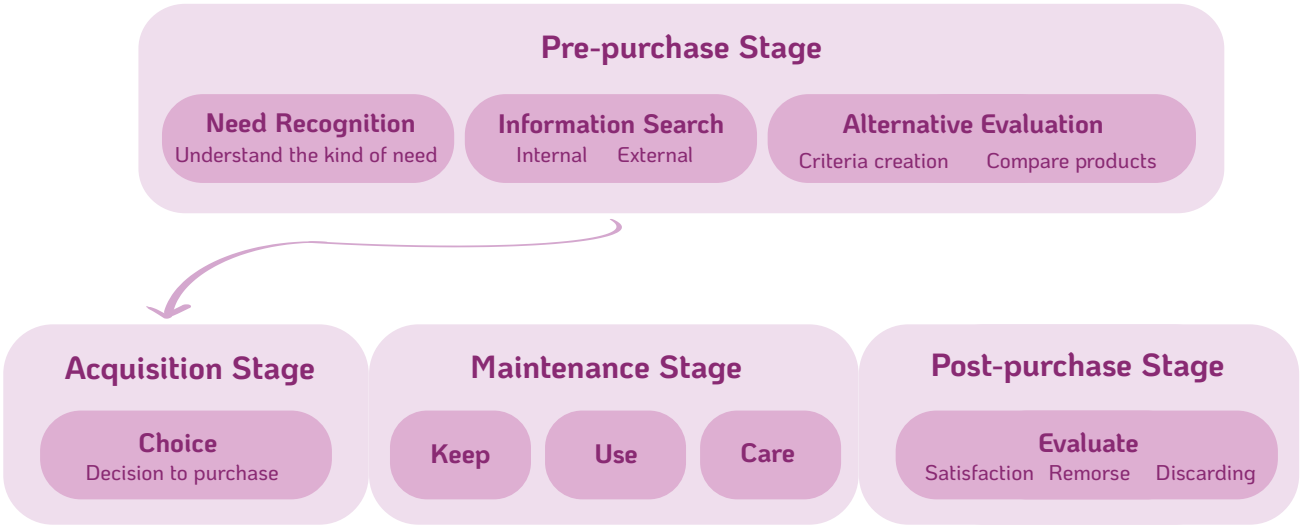



*Fig. 10. Overview of project focus on consumer's traditional decision-making process and apparel, adapted from Kotler and Armstrong, 2012.*

**Key insight**

*The acquisition stage is when the consumer makes the action relative to the selection decision. The pre-stage is equally important. When purchasing, people carry their values and needs to decide what to take. This project focuses on the acquisition stage, examining how people make purchasing decisions. To understand these decisions better, we will now explore the role of consciousness and awareness in shaping consumer choices.*

## 2.2.2 The role of consumer awareness

Consciousness encompasses both the ability to be aware of and the level of mental engagement with one's own existence, thoughts, and surroundings. It often involves System 2 processes such as deliberation, control, and effort (Williams & Poehlman, 2016). **While consciousness usually involves careful thought, research indicates that it can sometimes operate independently** of deliberate processes. For instance, individuals may make decisions with minimal awareness or face self-control conflicts, such as the tension between a desire to buy less and the impulse to make purchases (Fishbach et al., 2003; Loewenstein, 1996). **While individuals possess both automatic and deliberate decision-making processes, they may activate one of them more than the other** depending on the situation. For a clearer understanding, refer to Fig. 11, which illustrates how different processing systems influence a consumer's shopping experience.

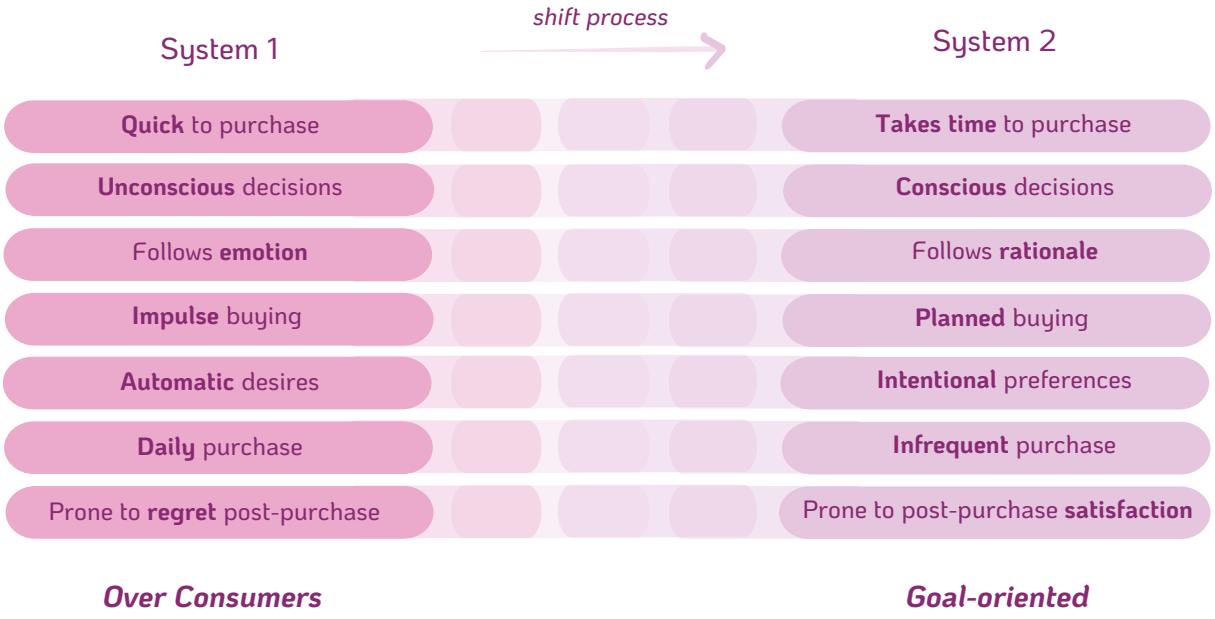



*Fig. 11. Clothing consumers cognitive processes and actions in System 1 and System 2, adapted from the Dual Process Theory.*

**To elevate consciousness and move away from this "out of control" dynamic, the initial step is raising awareness**, where individuals recognize and understand the impacts of their behavior. Awareness is crucial for fostering environmental consciousness, which significantly influences consumer decision-making regarding sustainable fashion choices (Gericke et al., 2019; Hasan et al., 2022; Kautish & Sharma, 2021; Prados-Peña et al., 2023; Seok et al., 2024). Environmental consciousness involves understanding and being concerned about the environmental impact of one's actions, and it plays a critical role in promoting sustainable behavior across various aspects of life (Jiménez-Sánchez et al., 2010; Seock, 2024). **A person's awareness and understanding of sustainability deeply affect how they view and react to environmental issues in fashion** and shape their values, attitudes, intentions, and behaviors regarding responsible consumption.

Consumers often construct their preferences on the go, during the moment of acquisition, making them vulnerable to various influences, both conscious and unconscious. Research by Souza et al. (2020) identifies environmental consciousness, perceived values, and risk factors as crucial factors

that influence consumers to make more environmentally responsible purchasing choices. Seock (2024) confirmed that **increased awareness of environmental sustainability—through knowledge and changes in attitudes and behaviors—acts as a catalyst for encouraging sustainable fashion behavior**. This includes preferring handcrafted items over mass-produced ones, looking for authenticity and supporting local brands. Environmentally conscious consumers prioritize environmental stewardship, social responsibility, and ethical governance of the brands when making purchasing decisions, reflecting a holistic approach to sustainable consumption. While existing studies on environmental consciousness primarily examine eco-friendly actions (Kim et al., 2023), there is limited exploration into how these attitudes directly influence consumer purchasing decisions, emphasizing the relevance of this project.

**Key insight**

*Consumer decision-making is complex, involving both deliberate thoughtful engagement and automatic processes, often subconscious responses. Research studies show that individuals may make decisions with minimal awareness or face conflicts between their conscious desires and impulsive behaviors, such as the tension between reducing consumption and impulse buying in fashion. Studies also show that when consumers become more aware of how their purchasing decisions impact the planet, they tend to choose products that have less impact. This includes avoiding fast fashion, which perpetuates unsustainable and unethical practices. Despite extensive research on eco-friendly actions, there is a research gap on detailed understanding of how environmentally conscious attitudes specifically influence consumers' purchasing decisions in the fashion industry. To bridge this gap, this project aims to impact consumers who predominantly engage in System 1 processes—automatic, fast, and intuitive decision-making—by encouraging a shift towards System 2 processes, which involve more deliberate, controlled, and reflective thinking.*

## 2.2.3 How Habits Shape Your Shopping

Scholars in consumer research are increasingly acknowledging the importance of comprehending how unconscious, automatic processes might impact consumer decision-making. While people may think they are making decisions based on careful thought and deliberate reasoning, many of their choices are actually shaped by unconscious factors and habits that they may not be fully aware of. Figure 12 illustrates the various influences affecting both processing systems in fast fashion purchases, highlighting different levels of environmental impact, automatic processes, and outcomes.

Some theoretical models elucidate how these processes occur.

The Model of Automatic Processes (Fig. 12) suggests that:
(A) The environment consists of another person's behavior, including mannerisms, posture, gestures, speech patterns;
(B) A person has automatic actions which are driven by habitual preferences;
(C) The behavior or habit comes to place.

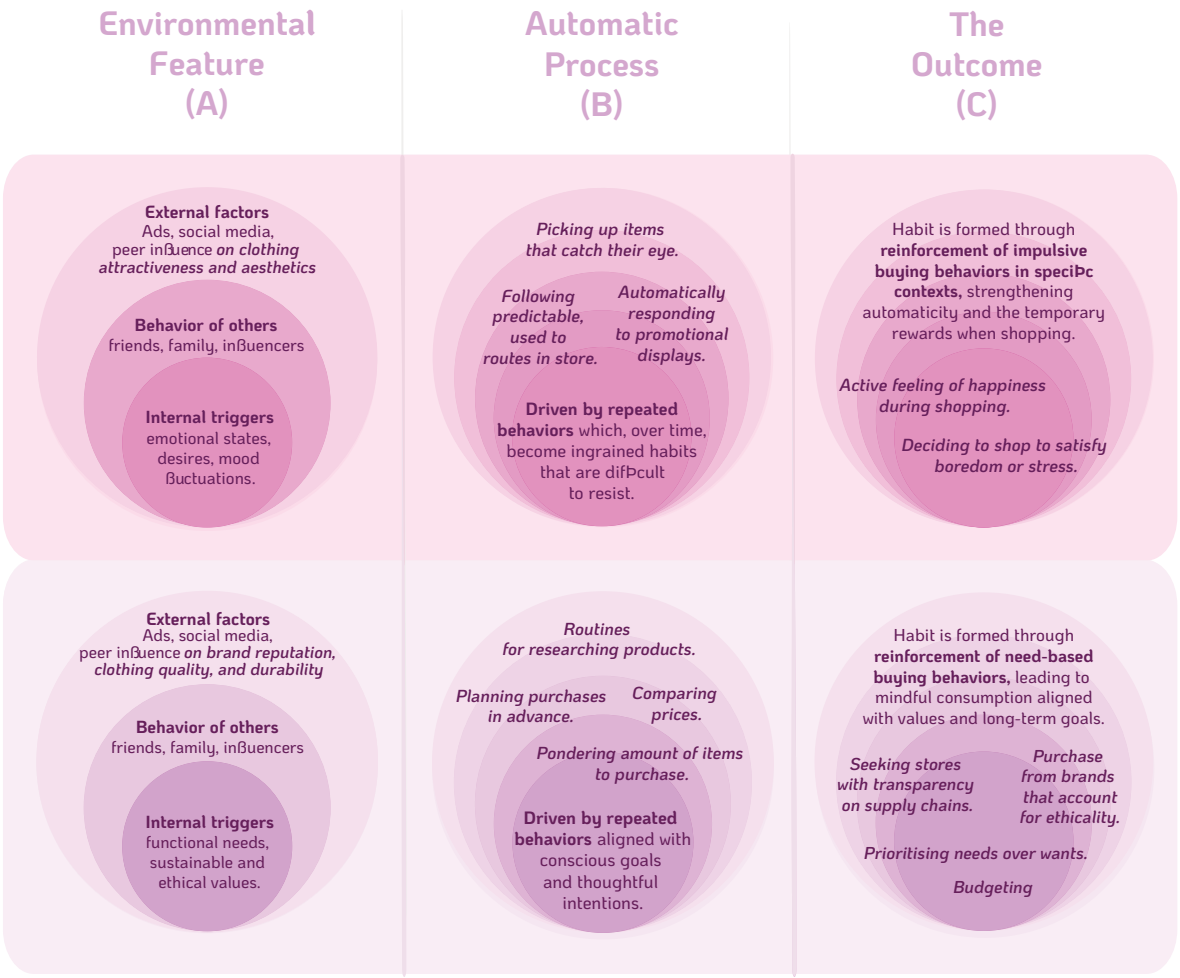



*Fig.12. Clothing consumer automatic processes developed by the author. Adapted from Model of Automatic Processes.*

Within the habitual nature of fashion shopping, individuals often make routine purchases to update their wardrobes or replace worn-out items, or keep up with seasonal trends. Habits, as described by Wood and Neal (2009), are automatic behaviors driven by repeated actions in specific contexts, often overriding personal goals and intentions. Ajzen (2000) emphasizes that **while knowledge about self-awareness and perceived behavioral control are crucial for decision-making, everyday life's demands, time constraints, and distractions can lead to habit-based choices** rather than deliberate actions. Seock (2024) extends this by showing that even when consumers are aware of sustainability issues, translating this awareness into behavior change remains challenging, underscoring the **need for effective educational and awareness campaigns present in the routine of someone going to shop**.

Self-Perception Theory (Bem, 1972) and the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) reveal that consumer behavior and attitudes towards brands and products are shaped by past actions and intentions. Nishino (2007) found that **awareness of resource scarcity encourages environmentally friendly choices**, indicating that informing consumers about sustainability can drive more conscious decisions. Integrating these insights, TRA shows that **positive attitudes towards behaviors enhance the likelihood of engagement** (Coleman et al., 2011; Shaw & Shiu, 2003). Thus, understanding how habitual behaviors interact with consumer attitudes and sustainability awareness can help design more effective interventions to promote sustainable fashion choices.

Incorporating insights from the Theory of Reasoned Action (TRA), Figure 13 illustrates what leads to influencing sustainable behavioral change within the fast fashion industry. The main factor is Knowledge-based consuming, represented in Figure 13 as Challenge Belief. Through bringing information on the environmental and social impact of fast fashion to the world, status-based consuming and social-based consuming, respectively behavioral and normative beliefs are challenged. **Through confronting these beliefs, the consumers may take action to critically assess their attitudes and beliefs in light of new information**, and then they may realize that their current behaviors are incongruent with their values or goals. This reflection can motivate them to form new intentions aligned with their revised attitudes, such as adopting more sustainable consumption practices related to fast fashion. Over time, these intentions can translate into actual changes in behavior as individuals actively strive to align their actions with their newly formed attitudes and intentions.

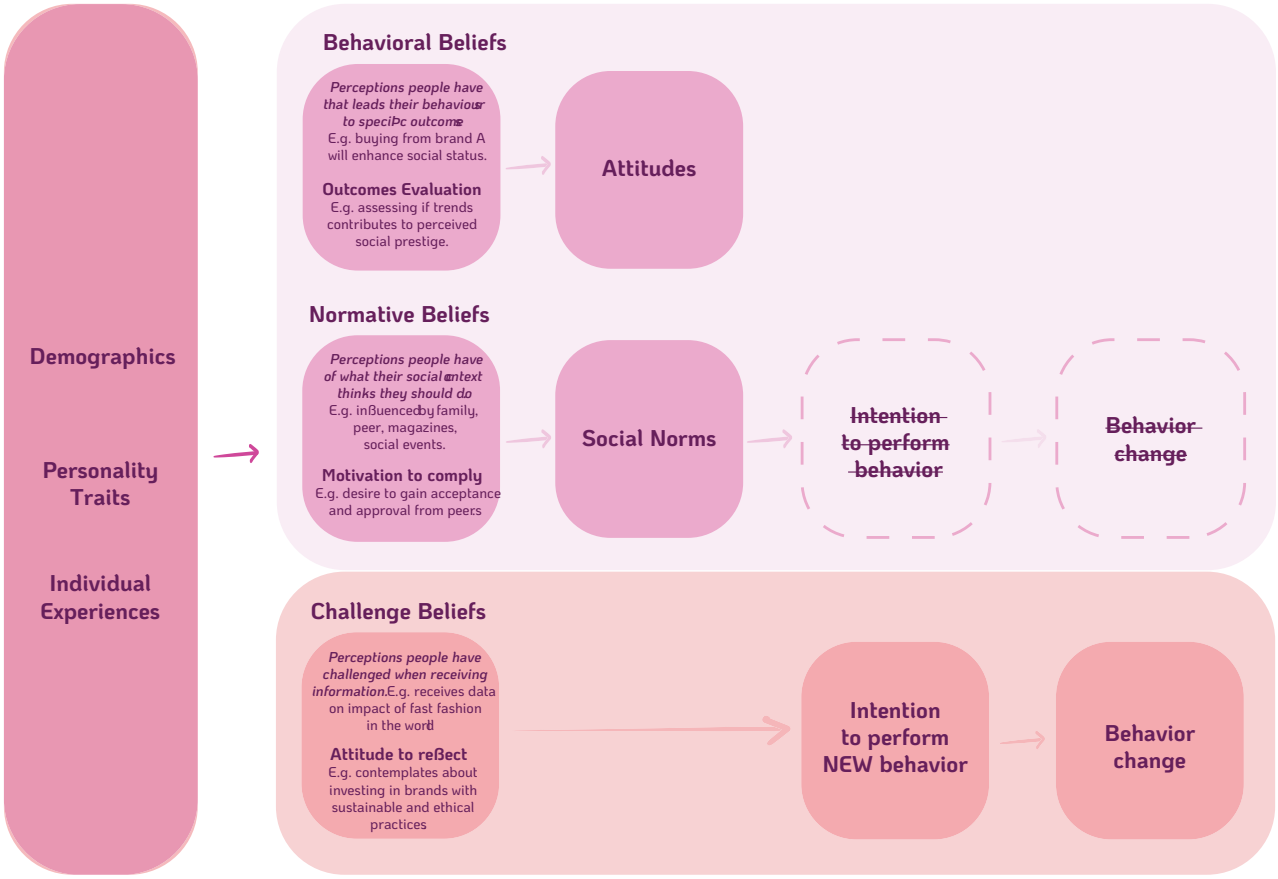



*Fig. 13. Factors that influence behavioral change in the fashion industry, adapted from TRA*

As a researcher, it is crucial to identify and describe the processes that individuals are not always aware of when making decisions or taking actions (A, B, C). This approach helps advance a model of non-conscious processes in consumer behavior, as validated by quantitative modeling research (Erdem, 1996; Roy, Chintagunta & Haldar, 1996; Seetharaman, 2004). Understanding how habitual behaviors impact fashion consumption is essential for facilitating more deliberate and mindful choices in a dynamic market. **Confronting existing normative and behavioral beliefs can be done by encouraging reflection and challenging ingrained habits**. This can potentially prompt consumers to align their values with more conscientious consumption practices, as illustrated in Fig. 13.

Key insight

*Consumer decision-making is heavily shaped by unconscious, automatic processes that often drive habitual choices. Many consumers purchase fast fashion impulsively, guided by these automatic behaviors, without fully considering the environmental impact. To address the issue that Seock (2024) identifies—consumers often struggle to translate awareness into behavior change, the project addresses this by using images that vividly depict the environmental consequences of fast fashion and that are thought out to be placed as part of the routine of individuals when shopping, a distraction. The images aim to address the automatic actions (B) driven by habitual preferences and influence the behavior (C) that stem from these habits. By focusing on how the environment (A) and automatic behaviors affect decision-making, the project seeks to disrupt habitual consumption patterns and encourage consumers to move from routine, unconscious decisions towards more reflective and deliberate choices.*

For this project, identifying which parts of the decision-making process lie outside of conscious awareness is crucial because it helps in evaluating how effectively the images depicting the environmental impact of fast fashion might influence consumer behavior. By focusing on these automatic processes, the researcher can better tailor the images to raise awareness, encouraging reflection and inspiring action to promote sustainable fashion purchasing practices. To further enhance this impact, **it's essential to explore how messages can be crafted to reduce the psychological distance between consumers and the data presented**, making the environmental consequences of fast fashion more salient and immediate in the images.

## 2.2.4 Bringing a Closer Focus to Issues

Strategies for crafting messages that bridge the psychological gap between consumers and abstract data can be guided by Construal Level Theory (CLT; Trope & Liberman, 2003). This framework provides insights into how psychological distance from the environmental impact of the actual situation influences the consumer perception and processing of information. Applied across various fields, including psychology, marketing, decision-making, communication (Fiedler, 2007), and sustainable behaviors (e.g. Bartikowski and Berens, 2021; Ryoo et al., 2017; Schill and Shaw, 2016; Yang et al., 2015; Wei and Jung, 2021), CLT highlights that when something feels psychologically distant, individuals tend to view it in abstract, simplified, and prototypical terms (Liberman, Trope & Stephan, 2007), focusing on the total picture, which is perceived as either desirable or undesirable (Trope & Liberman, 2010). Conversely, when the issue is perceived as closer, people evaluate it in more concrete, detailed, and contextualized terms. Then the focus will be on the feasibility of the event or object and the path in which to reach the event (Trope & Liberman, 2010).

Research has shown that consumers with a high (vs. low) construal level rely more on intangible (vs. tangible) attributes for product evaluation (Ding and Keh, 2017). Higgins et al., 2003 highlighted that when sensory information matches the psychological distance of a brand, it is more effective and valuable in conveying the message. De Vries & Fennis (2019) demonstrated that **when sensory imagery** (such as visuals, sounds, or other sensory experiences) **aligns well with the psychological distance associated with**

| | High Psychological distance | Low Psychological distance |
|---|---|---|
| **Temporal** | Transcending from the future or from the past... | To the 'now' (Henderson, Fujita, Trope & Liberman, 2006).<br><br>**Image content:** visuals of detailed imagery, concrete examples of now.<br>**Intervention:** placing the experience in the center of action - where individuals make decisions. |
| **Spatial** | Transcending from perceived 'distance' in physical space... | To the 'here' (Henderson, Fujita, Trope & Liberman, 2006).<br><br>**Image content:** visuals having local relevance.<br>**Intervention:** placing the experience inside the fast fashion store - where purchasing happens. |
| **Social Distance** (ego centric perspective) | People distant to the self, with a more abstract representation lead to high-level construals in mental processing. | People who share common traits, behaviors, values, or experiences with each other or in groups are perceived as socially closer (Prentice, 1990).<br><br>**Image content:** visuals targeted to a specific group of shoppers.<br>**Intervention:** UX messaging structured specifically to connect with target group, interactive features. |
| **Hypothetical Probability** | Unlikely events are further away from the now, leading them to be processed with a focus on more abstract processing and high-level construals (Wakslak et al., 2003). | When an event is likely to happen, people approach it with more concrete representations (Wakslak et al., 2003).<br><br>**Image content:** environmental degradation, it is already happening. |

*Table 1. Construal level theory and examples of how it can be applied in intervention.*

**the brand's country of origin (COO), it makes it easier for consumers to process** and understand the information (Alter & Oppenheimer, 2009). Bridging the psychological gap between consumers shopping choices and the consequences of their consuming decisions can be adjusted by manipulating aspects such as time, space, social connection, or probability (Liberman et al., 2007), which are correlated (Bar-Anan, Liberman & Trope, 2006). Table 1 illustrates these levels and how each was used in the project.

Exploring spatial distance through the five senses helps define physical proximity. **Tasting, touching, and smelling are associated with psychological closeness**, while seeing and hearing increase psychological distance (Trope & Liberman, 2010). For more immediate relevance, adopting an egocentric perspective, either to the self or having a similar interpersonal relationship with people from the ingroup, leads to being more familiar to the self, being socially closer (Liviatan, Trope & Liberman, 2008), is crucial (Trope & Liberman, 2010).

**Key insight**

*Research has demonstrated that psychological distance significantly influences consumer perception and evaluation of information. Much of the existing literature, however, has concentrated on psychological distance related to a brand's country of origin, rather than the physical location of the store. To address this gap, this project uses relevant and immediate visuals tailored to consumers' local contexts. By focusing on consumers' residency, the project aims to make the environmental impact of fast fashion more relatable and actionable. The project incorporates lower construal levels related to time, space, social distance, and likelihood, to effectively enhance the consumer experience. To further refine this approach, we now turn our attention to how message communication must be strategically designed to deeply resonate with the target audience and drive meaningful engagement.*

## 2.2.5 Crafting Messages for Responsible Shopping

To reduce consumption, the strategic approach of Green Demarketing (Soule et al., 2015) is employed across various industries, including fashion, using Prospect Theory (Kahneman and Tversky, 1979) to structure messages as either loss- or gain-framed. Research indicates that **loss-framed messages, which emphasize the negative consequences of specific actions or inactions, are generally more effective in influencing consumer decision-making**, especially in situations where the goal is to prompt immediate action. This can be effectively conveyed through visuals that highlight potential drawbacks or negative outcomes, such as cost, time, comfort, or environmental impact. The use of loss-framed messages highlighting the negative environmental impact has been utilized by some fashion brands (Patagonia, 2011; Freitag 2019) to provoke their consumers and the broader industry. Brands in other sectors, like DataWagashi (2024) in the food industry, have also employed these strategies. However, there is a gap in research and societal application of these strategies specifically within the fast fashion context.

To further enhance the impact of content to raise awareness and prompt perception change, it is essential to explore the Accessibility-Diagnosticity Framework (Feldman and Lynch, 1988). This framework

assesses how conscious and unconscious elements affect decision-making by making information easier to remember and evaluating how well it helps differentiate between alternatives, as illustrated in Fig. 14. **For the fast fashion industry, Selective Attention and Stimulus Salience can be used together to enhance the accessibility of information in the consumer's mind** during subsequent encounters. When information is specific to what consumers want (selective attention) and is attention-grabbing (stimuli salience), it can lead them to contemplate and adopt new behaviors, particularly when shopping for clothing. The other three factors—specific training, associative activation, and priming—can also impact consumers' decision-making and experience to other degrees. These factors are considered at secondary and tertiary levels, as their influence depends on the individual's background, experience, and exposure to advertisements on similar themes. **Through the diagnosticity aspect of the framework, brands can enhance awareness of consumers by selecting information that is most pertinent and informative for consumers' decision-making needs**, streamlining the process.

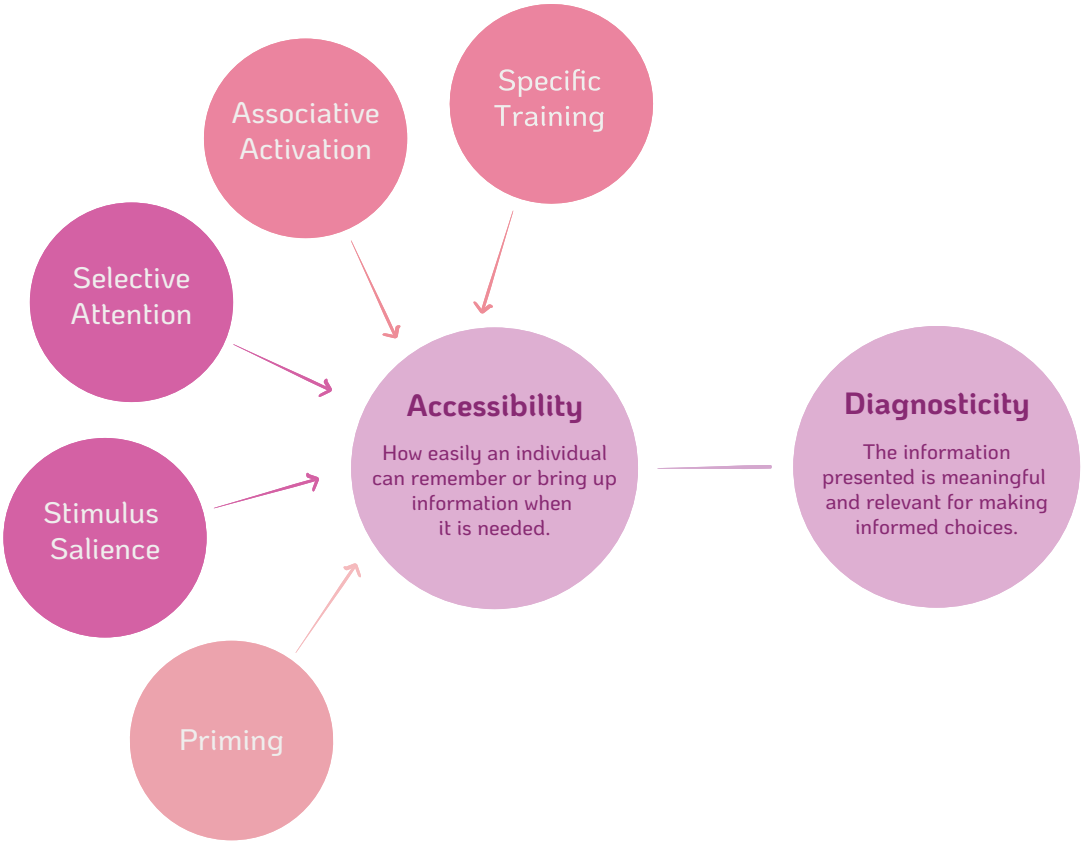



*Fig. 14. Flowchart of Accessibility-Diagnosticity Framework, highlighting factors that will most influence consumers towards behavioral change when interacting with generative AI art experience.*

Effective messaging can significantly influence consumers' perception of a brand. Research shows that **loyalty is closely tied to honesty** (Shao et al., 2023). When a brand demonstrates transparency by sharing specific details about its activities, it fosters trust and a sense of security among consumers, as illustrated in Fig. 15. This openness reassures consumers that the brand is genuine and trustworthy. Furthermore, **when consumers perceive that a brand's values align with their own, it enhances their confidence in the brand, leading to a sense of self-empowerment**. This alignment of values not only strengthens loyalty but also creates a reinforcing loop where consumers feel a deeper connection to the brand, driven by shared principles.

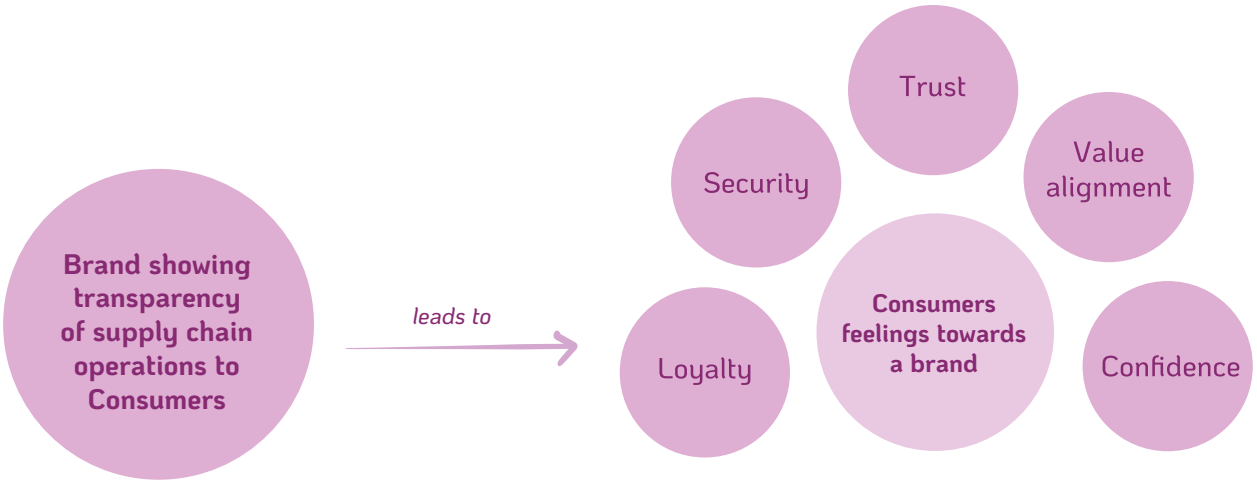



*Fig. 15. Impact of knowledge sharing on clothing consumers feelings, designed by author.*

Consequently, even fast fashion brands that traditionally focus on high-volume sales can leverage such transparency to differentiate themselves, build consumer trust, and foster long-term loyalty.

**Key insight**

*While loss-framed messaging has been effectively implemented in various industries to influence consumer behavior, there is a significant research and application gap in applying these strategies specifically within the fast fashion sector to address and reduce consumption. Leveraging Selective Attention and Stimulus Salience can enhance the impact of such messaging by ensuring that it captures consumer focus and emphasizes key aspects of the environmental impact.*

Having explored the mechanisms of consumer awareness and decision-making processes, we now turn our attention to the practical application of these theories. The next chapter delves into how both traditional and generative visual art can be strategically used to engage consumers and promote socio-environmental consciousness within the fast fashion industry.

# 2.3 Using Visual Art as a Strategy for Socio-Environmental Impact in Fashion

## 2.3.1 Aesthetic features for image composition

To understand how visual arts can drive socio-environmental impact, we first examine aesthetics, the commonly recognized characteristics or qualities observed when people engage with art. Visual arts, including painting, drawing, sculpture, and photography, play with two key properties: formal-perceptual properties and conceptual-representational properties. Formal-perceptual properties such as shape, line, and **color evoke immediate emotional responses** (Rosenberg et al., 2018; Zwaan et al., 2018). **Visual framing, such as zoom-in and zoom-out, further influence emotion** by directing attention and altering the viewer's engagement with the artwork. **Zoom-in, for instance, intensifies focus on specific details, heightening emotional impact, while zoom-out offers broader context, affecting how the viewer interprets and connects with the piece**. Additionally, conceptual-representational properties use language and imagery to convey abstract ideas (Leder et al., 2004; Pelowski et al., 2017). These shape how individuals appreciate ideas (International Encyclopedia of Education, 2023), engaging the intellect and understanding (Chatterjee et al., 2010).

Studies demonstrate that composition, often described as the "science of combination," involves aspects like the spatial relationships of elements, which contribute to aesthetic quality. It encompasses principles such as balance, movement, color, and contrast, among others (Beelder, 2020). Over time, the concept of composition has evolved to include perspective, geometric shapes, and the placement of elements within the artwork, as well as an understanding of the physical positioning of the original piece. Therefore, **examining the use of color, composition (including zoom-in and zoom-out techniques), and imagery is crucial for altering perceptions and enhancing awareness**. This is the primary focus of this section.

**Key insight**

*Analyzing how formal-perceptual properties (such as shape and color) and conceptual-representational properties (such as ideas through imagery and framing) affect emotional responses and intellectual engagement is key to understanding how art can shift perceptions and enhance awareness.*

### *2.3.1.1 Use of saturation*

Colors encompass chromatic colors (with hue and high saturation) and those with achromatic or neutral colors (no hue and saturation, only shades of gray) (Caivano, J. 2022). Hue and saturation affect emotions and psychological states. Valdez and Mehrabian (1994) found that these **color properties are linked to emotions**, specifically described in terms of valence (pleasantness), arousal (excitement), and dominance (control). **Valence and arousal are particularly important in the context of art, as they influence how viewers perceive and emotionally respond to visual stimuli**. Recent studies suggest that color in art, both in-person and online, activates brain structures associated with reward (Trupp, 2023) and can enhance memory and stimulate associative thinking processes. Trupp (2023) discusses that these engagements are linked to positive outcomes, such as appreciating the art more (attraction),

finding it personally significant, and wanting to experience it again. The study by Pelowski et al. (2017) supports these connections, showing that deeper processing, which involves more thorough engagement and reflection, often leads to a more profound and meaningful experience. Thus, the **use of color in art not only affects immediate emotional responses, such as valence and arousal but also promotes deeper reflection and long-term engagement**, enhancing the overall aesthetic experience. These aesthetic elements are important in research due to their ability to influence consumer interaction with the images that serve as stimuli in the experiments.

Colors or no colors have the characteristics of changing the visual size, weight and focus of the subject (Zhang, 2011). It can be used to evoke specific emotions and create a certain atmosphere (Li, 2022). Li states that the thoughtful use of color can enhance the audience's emotional engagement with the scene, making it easier for individuals to immerse themselves in the experience and connect with the story being told. Palmer et al. (2013) found that higher saturation and brightness are associated with happiness. Emotional responses to color or the lack thereof can be influenced by new combinations of color that distance from what people are used to, capturing attention and provoking curiosity or surprise (Baumberger, 2013; Goodman, 1968). Conversely, familiar uses of color similar to everyday experiences, can evoke feelings of comfort or nostalgia (Skov & Nadal, 2020; Stolnitz, 1992). For instance, the traditional colors of nature can create a sense of familiarity and emotional connection.

**Key insight**

*The manipulation of color and framing can significantly affect emotional responses and viewer engagement. Employing vibrant or novel color schemes can stimulate viewer interest. Neutral colors or grayscale can be used to evoke different emotional responses and create specific atmospheres.*

### *2.3.1.2 Framing visuals*

Successful visual communication relies not only on capturing initial attention through saliency—emphasizing certain features to stand out—but also on a carefully orchestrated arrangement of visual elements, which directs the viewer's gaze and maintains interest throughout the viewing experience. According to Langacker (2008), achieving a coherent and compelling visual narrative requires a strategic composition that thoughtfully integrates these elements. Beelders et al. (2020) further highlight that **successful composition involves directing the viewer's eye through various aspects of the image**, through framing techniques such as zoom-in and zoom-out.

### *2.3.1.3 Use of visual imagery (elements)*

From the classical saying "an image is worth a 1000 words" by Henrik Ibsen in 1906, images have the ability to transcend language barriers, conveying stories and scenes that connect people from different cultures and backgrounds, serving as an expression tool for communication. Visual art has the power to be transformative, since through conveying simple to complex ideas, it can be addressed to challenging societal norms, provoking discussions on relevant issues; **the power of a visual image is essential for emotion building and influencing conscious thoughts**. Bodily reactions depicted in visual imagery, which are typically thought to be caused by emotions, might actually trigger the experience of those emotions. Serrao et al. (2024) emphasizes that engaging with art vicariously can enhance one's ability to recognize and differentiate his/her own emotions more precisely. In particular, experiencing

negative emotions through art provides a safe context without immediate risk.

Within image content, research has emphasized that images with apocalyptic themes can distance viewers from reality, potentially undermining the goal of enhancing awareness. Instead of fostering a deeper understanding, such imagery may have the opposite effect, leading to disengagement. Therefore, **images that closely reflect real-life aspects are preferable for effectively communicating messages and raising awareness**.

**Key insight**

*Visual images surpass the limitations of verbal language, bridging cultural gaps, and convey messages with just a single frame, connecting individuals on a deep, intuitive level. To be most effective, images should reflect real-life aspects.*

## 2.3.2 Engaging emotions with art

Visual art has the ability to inspire change. Researchers contend that art's value can be examined by the impacts that it produces. Appraisals offer an opportunity to delve deeper into how art affects people beyond simply stating whether we like it or not. The theory of appraisal in psychology proposes that individuals assess and make sense of events or stimuli in their surroundings, which then triggers emotional reactions and behavioral responses. **When people come across artwork that has visual appeal and that evokes a strong emotional reaction, it subsequently impacts their actions**. This highlights their engagement in the process of appraising the artwork and determining its significance to them. Understanding how an artwork makes people think or feel provides valuable insights into the diverse impacts of art (Christensen et al., 2022; Wassiliwizky et al., 2021). For example, feeling curious about an artwork indicates a desire to learn more about the artist or the piece itself (Silvia, 2010; Vogl et al., 2020). Similarly, experiencing an insight or 'aha' moment suggests that the artwork has led to a new understanding or perspective (Muth et al., 2015; Pelowski, 2015). Profound emotions such as the sublime can signal a profound transformation in our thinking and perception (Pelowski et al., 2020).

Visual art can be strategically used to influence consumer behavior. Studies show that involvement with arts, music, and poetry helps individuals develop emotional intelligence, leading to improved self-awareness and communication skills (Wassiliwizky et al., 2017; Váradi, 2022; Syrotkina et al., 2022). Specific to art, Syrotkina et al. (2022) argues that individuals with high EQ understand their emotions deeply and exhibit strong empathy. This emotional understanding enables more adaptive behavior and better interactions with others (O'Connor et al., 2019). According to Goleman (1995), emotional intelligence (EQ) encompasses five core abilities - self-awareness, emotional control, self-motivation, empathy, and handling relationships - which collectively facilitate social communication and personal development (Goleman, 2021). **Increasing these EQ abilities can reduce overconsumption**.

Emotional engagement can be particularly effective when visual art is used strategically. The focus on imagery can trigger consumers' empathy, helping individuals to understand broader environmental and social impacts, guiding more responsible choices. Individuals can develop stronger self-awareness and emotional control (Goleman, 1995), helping to recognize the underlying emotional triggers that drive consumption and developing strategies to cope with the triggers, leading to a decrease in unnecessary purchases. Developing inspiring visuals can also boost self-motivation by reminding consumers of their sustainability goals and the positive impact of their actions (Goleman, 2021). "By teaching people

to tune in to their emotions with intelligence and expand their care, we can transform organizations from within and bring a positive effect to our world" (Goleman, 2021).

Experience of art activates perspective-taking and empathy (Adamaszek et al., 2022), and visual images have significantly positive impacts on consumer emotions and judgments (Lang Barton, 2015; Schlosser, & 2003; Sherman Greenfield, 2013). Truppe et al. (2022) suggest that **emotional enhancement can be achieved by self-selection of artwork**. Implemented in art research (Cotter et al., 2022) and music interventions (Howlin & Rooney, 2022), the authors recommend its use in future studies. Studies have demonstrated that art perception and the experiences and appraisals that follow are susceptible to priming (Brieber, Nadal, Leder, & Rosenberg, 2014; Cupchik, Vartanian, Crawley, & Mikulis, 2009). Using a pragmatic versus aesthetic viewing condition, the aesthetic condition can lead to stronger feelings of pleasure (Cupchik et al., 2009). Similarly, a recent study has also attempted to increase immersion through viewing behavior instructions (Cotter et al., 2022), finding potential impacts and offering exciting new design applications.

**Key insight**

*While Valdez and Mehrabian (1994) explores how color influences emotional responses and cognitive processing, there remains a research gap on the interplay between color/no color and zoom-in/zoom-out composition.*

## 2.3.3 Appraising Traditional vs. Generative Art for Changing Perceptions

### *2.3.3.1 Traditional Art: Environmental Messages in Fashion*

Climate change urgency (Duxubry, 2010; Galafassi et al., 2018; Rice et al., 2019) has sparked interest in understanding the role of the arts in engaging emotionally (Brooke, 2022) and promoting behavior change (Sommer et al., 2019). **Influencing engagement can be done by representing positive and negative emotions in visuals** (Klöckner et al., 2018). While negative emotions may initially capture attention, it can lead to distancing individuals from taking action, due to fear, with feelings of helplessness and overwhelm. Emotional engagement through art exhibitions focusing on human impacts on the environment has been explored in research by Luna-Jiménez, C. et al., (2024). Further research is needed to fully understand the extent of art's potential in fostering behavioral change and its broader impact on society. The provision of factual information alone has proven inadequate in driving widespread behavior change regarding climate change and its environmental impacts. Pathak et al. (2024) analyzed fast fashion brands' reports from 2019 to 2022, showing that financial success and sustainability are achievable. However, challenges persist, such as incomplete supply chain transparency and the risk of 'greenwashing,' where brands mislead consumers on how environmentally friendly they are. However, visual arts may serve as a powerful tool in engaging people and influencing behaviors to mitigate the effects (Table 2).

Works of art can also be considered a means of social learning, which involves observing others' behavior (Grusec, 1994; Yılmaz et al., 2019). Research by Das (2020) indicates that **integrating images and text with sentiment in social campaigns enhances acceptance and engagement.** Social media platforms like Instagram have revolutionized photography by democratizing it, allowing for widespread personal

| Representation of the art | Art details | Concept(s) addressed |
|---|---|---|
|  | **Atacama Fashion Week - Turning Trash into Fashion (2024)**, campaign created by NGO Desierto Vestido Chile, Fashion Revolution, and Instituto Febre. Production: Sugarcane Filmes and ad agency Artplan - Brazil. | **Dangers of overconsumption and production of items for fashion trends:** becoming aware of the reality of fast fashion end of-life clothing consequences of overdiscarding and clandestine burning of large amounts of clothing. Models had outfits crafted by fashion designers from discarded garments on Atacama desert. |
|  | **Dead White Man (2022-2023),** by Jeremy Hutchison. Part of Speak Volumes campaign (2023), initiated by the Or Foundation. Visual art in form of photography. | **Overproduction of clothing:** reflecting on wastefulness and consumerism in the fashion industry. **False reality of the second hand market:** offering Western consumers a feel-good pretext for creating a sense of sustainability without challenging underlying behaviors of excessive consumption and disposal. |
|  | **Long Live Fashion (2022)** campaign from Vestiaire Collection platform. Puppets in the image are human-sized, crafted by the Puppets Magic Studio. Photographs are taken by Campbell Addy. | **Connecting consumers to pre-loved clothes and to high-end fashion reselling (brand's philosophy):** environmental sustainable practices brought to the streets. The campaign as a form of visual art made into strategy to connect individuals with different style tribe puppets, from the brand's community. |
|  | **Don't Buy This Jacket (2011)** campaign poster, by brand Patagonia. | **Reflecting on purchasing decisions and questioning the reasons and the context behind the decisions:** challenging consumers' beliefs and disrupting their automatic processing of information, through campaign's negative message (loss-framed). The explicit message through a loss-framed approach shows that there needs to be a stop in consumption. |

*Table 2. Examples of artworks used to raise awareness of the consequences of fashion in the world*

expression and community building. High-quality images significantly influence consumer behavior and environmental advocacy, highlighting socio-environmental issues and fostering social emotions through realistic depictions of people, environments, and animals. As seen in Table 2, **photography is widely used in commerce through advertising and marketing to more closely depict aspects of reality**. Farnsworth (2011) further demonstrated that photographic approach makes the target audience aware of natural or any other social issues experienced, enhances social emotion.

*"Systemic change in the fashion industry is critical, and as citizens we all have a role to play. From brands, we want accountability and robust commitments. From governments, we need to demand public policies and oversight. With civil society, our role is to disseminate information and drive mobilization actions," states Fernanda Simon, Executive Director of Fashion Revolution Brasil - the Brazilian organization of the largest fashion activist movement in the world*

**Key insight**

*Traditional campaigns often highlight the negative consequences of overconsumption and waste, fostering reflection and encouraging behavior change, as supported by studies from Luna-Jiménez et al. (2024) and Klöckner et al. (2018). However there remains a gap in the use of AI-generated art for this purpose. Exploring the current use and potential of generative art in this context opens new avenues for creating impactful and engaging content.*

### *2.3.3.2 Generative Art: Current Use and Potential*

Evolving from traditional visual art, from paper to digital, generative AI art is now out there to the public. It involves the use of algorithms to create new uses including images, installations, and experiences. These AI models are Generative Adversarial Networks (GANs) that have revolutionized the field of generative modeling (Theis, L. 2015; Song, Y. 2019; Ruhoto, L. 2021). Trained on vast datasets, they can generate unique pieces by learning patterns, styles, and techniques from this data.

Becoming public makes it accessible to the mass market, allowing people to use it from their homes with AI online tools such as MidJourney, Dall-E and DreamGen, and enjoy these in different locations as a public experience of art offered by existing companies who are trying to revolutionize their industry by using this technology. Artists also have been using this type of art, but more specifically to create projects that are critical to society and stimulate dialogue (see more in ***Appendix C*** how AI is used for dialogue). Artists like Petrić (2016), who connect ecological consciousness with their work, and Chung (2023), who explore themes of artificialness, demonstrate how AI opens new paths for the future. Table 3 shows these different artists, their artworks and concepts addressed.

A study by Demmer et al. (2023) found that **participants reported experiencing emotions and attributing intentions to artworks, regardless of whether they believed these were created by a computer or a human artist**. Interestingly, such responses to computer-generated images challenge the notion that AI art cannot evoke emotional and intentional human elements. However, it also found that participants reported stronger emotions when they knew the artwork was made by a human.

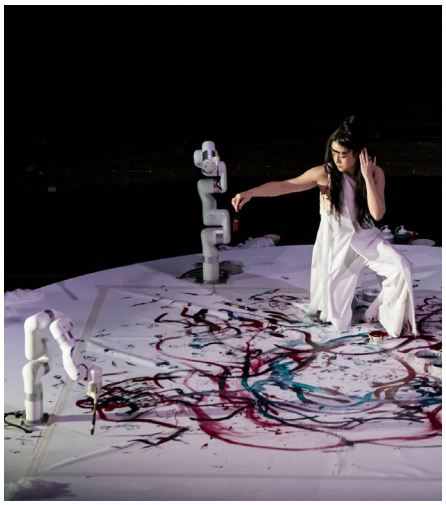
| Representation of the art | Art details | Concept(s) addressed |
|---|---|---|
|  | **Realm of Silk (2023)**, by Sougwen Chung | **Technology embodying the potential for evolution and change through artificial consciousness:** Drawing inspiration from both nature and technology to investigate the encounter of computers – particularly artificial intelligence and robots – and humans, Chung hand-drew lines with various algorithms, mirroring silk's beauty and complexity and the natural processes of silkworms, through its transformation and metamorphosis symbolism. |
|  *Lost skies - Air Pollution Through the Eyes of a Believer*  *Lost skies - Arctic Habitat Disappearing Through the Eyes of a Believer* | **AIEye (2016)**, by Maja Petrić | **AI as a tool to engage audiences emotionally in climate change issues:** Through a custom AI system developed by the artist, inspired by impressionist landscape painting, numerous images were processed. The images document people's visions of nature into a single representation, fostering dialogue and reflection on environmental challenges. |
|  *One of the multitude of images, part of the artwork Human Cell Atlas.*  *Demonstration of different tools used for creating the artwork.* | **HUMAN CELL ATLAS_ Neuroorganismic AI Data Spatial Painting of Humanity (2024)**, developed by the OUCHHH studio.<br><br>Partnership with CERN | **AI-generated art versatility:** Marking a historic moment in art history, the digital version of the artwork made its way to the moon, through Odysseus mission's moon lander. Data was collected from the Human Cell Atlas database and images were created and presented in both large-scale installation and as a one-of-a-kind collector format. |

*Table 3. Overview of AI-generated artworks towards climate and society concepts.*

In the fashion field, more and more AI art has become a medium for retail brands to promote customer wellness and sensory appeal (Arigami, 2023) that extends beyond the shopping experience. **Brands are exploring using user interactivity for in store experiences, creating aesthetic pleasing environments** (Adidas, 2022). News outlets (Forbes, 2024) state that these interventions are AI-generated however are using motion technology for creating moving arts. It is being used by big brands like Adidas to keep users longer in stores by having engaging screens that make users focus on the art displayed. Additionally, existing research focuses on how generative AI assists consumers with selecting outfits, colors, and sizes (Zhang, Y. 2024). Building upon these developments, **there remains a gap in understanding how generative AI art can be utilized inside fashion stores to support sustainable decision-making**. Specifically, there is a lack of research on how AI can be integrated into the process to enhance awareness of consumers towards more sustainable choices, such as evaluating the environmental impact of their purchases.

| | Brand | Goal of experience |
|---|---|---|
|   | **Adidas and design partner YSP (2023)** in flagship store - Beijing. | **Customer retention in store:** Customers' feet were scanned and the AI software generated a custom sneaker design based on their biometric data. Design (color, details) could be adjusted. Shoes were sent to an on-site factory for production. Customers were encouraged to take photos and share their designs on social media, creating a buzz around the brand and driving more traffic to the physical store. |
|  | **H&M partnered with design agency Hirsh & Mann** in flagship store - London.<br><br>Red Dot Award **(2023)** | **Customer retention in store:** Large-scale generative artwork called H&M Infinite Dreams evolves in response to customer movements. The color changes in line with the time of day, seasonal campaigns and with upcoming collections. |
|  | **Bvlgari and Refik Anadol (2023)** in Milan. | **Sensory appeal:** Serpenti Metamorphosis is a multimedia artwork generated by artificial intelligence: the algorithms trained on more than 200 million images of nature design sculptures of data to transform natural phenomena into poetic images. |

*Table 4. Examples of AI used in fashion stores*

More studies demonstrate that **digital art viewing is occurring to such an extent that it has been called the most common means of 'real life' art engagement** (Leder et al., 2022). This rise in digital art engagement can also provide new avenues for designing and implementing environmental awareness interventions with generative AI. Extant studies confirm though that a multi-sensory approach generates multiple perceptions for consumers and influences brand equity (Cho et al., 2015; Streicher Estes, 2016). Behavioral evidence strongly supports the importance of other sensory stimuli over visual imagery.

**Key insight**

*Generative AI art is increasingly being integrated into various sectors, including fashion, to enhance customer engagement and sensory experiences. While current research shows that AI-generated art can evoke emotions and intentions similar to traditional art, there is a notable gap in leveraging this technology to promote sustainable decision-making in fashion.*

The extensive research on visual art and generative AI art provides valuable insights into their impact on emotional engagement and perception. Studies reveal that **combining aesthetic elements such as color, shape, and framing in visual art has the potential to forge deep emotional connections and shift perceptions.**

Traditional advertisements have effectively used visual art to promote environmental awareness, while the emerging use of AI-generated art in interactive experiences, particularly in the fashion industry, highlights its potential to engage audiences in novel ways. **Bridging these approaches: ads and experiences in fashion, by integrating AI with environmental consciousness can enhance both the emotional and intellectual impact of art,** paving the way for innovative strategies that foster sustainable practices and drive meaningful change.

**Major takeaway** from Related Works

# 2.4 Research Questions and Bridging the Gap

Building on the context presented in Chapter 1 and the literature addressed in this Chapter 2, **this project identifies and addresses significant research gaps related to how environmentally conscious attitudes influence consumer perspectives and actions within the fashion industry**. By focusing on interactive and extended consumer experiences during purchasing actions, **this project seeks to explore new methods for disrupting habitual automaticity**. This approach underscores the **potential of visual art to drive consumer engagement and change perceptions**, ultimately contributing to systemic change in fashion industry practices.

Despite extensive research on environmentally conscious attitudes, **there remains a gap in understanding how these attitudes specifically influence purchasing awareness and intentions.** This project aims to address this gap by **using impactful, personalized AI-generated images that depict the environmental consequences of fast fashion.** Each image is customized to be recognizable to the viewer, thereby increasing its overall impact. The AI images are designed to promote reflection and encourage action, by providing a visual and emotional stimulus that provokes a dual response (emotional and cognitive) that may bridge the gap between awareness and behavior. The AI images have the potential to change the valence of values and meanings associated with fast fashion, causally linking the action of purchasing fast fashion to negative environmental consequences. Through evaluating whether these images effectively inspire more sustainable purchasing intentions, t**he project seeks to offer insights into how heightened environmental consciousness can be induced by AI images**, in order to lead to facilitate actionable changes in consumer behavior, contributing to more sustainable fashion practices. As highlighted in Seock's research (2024) reviewed in this chapter, mere awareness is insufficient for behavior change; thus, **the present study investigated how images that evoke emotional responses or provide concrete, relatable information about the environmental impact of fast fashion can effectively bridge the gap between raising awareness and stimulating actionable behavior**.

In the context of this project, which utilizes images to illustrate the environmental impact of fast fashion, the type of awareness being addressed is primarily self-awareness (Ajzen, 2000) discussed in Section 2.2. By increasing people's awareness of how their choices affect the environment, the project encourages consumers to reflect on their own consumption habits and recognize the gap incongruence between their current behaviors and their desired sustainable practices.

Furthermore, as suggested by recent studies reviewed in this Chapter 2 advocating for localized approaches (e.g., Ding and Keh, 2017; De Vries & Fennis, 2019), **this research aims to address the gap by utilizing AI technology to align psychological distance with the physical location of the store itself, specifically within the context of fast fashion.** AI facilitates this alignment through dynamic adaptation, generating personalized content that makes the visual stimuli and its messages more relevant to the local audience, thereby enhancing proximity of the cause (consumer behavior) and consequence (environmental damage) relation, to influence consumer behavior in a specific country or city. In this study, AI's capability to customize and adapt content dynamically was employed to address psychological distance in various aspects of the intervention, including the visuals portrayed, the placement of the intervention, and its user experience (UX). The AI-generated images were designed to have concrete examples, familiar associations, geographical proximity, and communal connectivity.

Reviewed in section 2.3, companies such as Patagonia (2011), Freitag (2019), and DataWagashi (2024) have utilized loss-framed messages to engage consumers in the fashion industry. However, **there is a research gap regarding the application of these strategies specifically within the fast fashion context.**

This study aims to **bridge this gap by exploring how loss-framed visual messages through AI images can be adapted to fast fashion consumption behaviors.** While this research does not focus on a specific fast fashion brand, it provides insights into how AI can enhance the practical application of loss-framed strategies, offering a more dynamic and personalized approach to influencing consumer awareness.
The literature indicates that color saturation and hue can evoke immediate emotional responses and influence aesthetic appreciation (Chatterjee et al., 2010). However, there is a lack of specific research on how these properties, compared to colorless imagery, affect emotional responses in the context of socio-environmental messaging. This is crucial for evaluating which visual strategy better communicates the urgency of environmental issues.

Existing studies show that multi-sensory approaches can enhance consumer perceptions and brand equity (Cho et al., 2015; Streicher & Estes, 2016). While visual stimuli are well-studied, **integrating specific visual strategies, such as color use and perspective, into multi-sensory frameworks for socio-environmental impact remains underexplored**. This gap highlights the need for research into **how these visual factors can be optimized within sensory experiences to drive more effective consumer engagement**. Adding to this, a gap to address the interplay between color/no color and zoom-in/zoom-out composition on influencing emotional responses and cognitive processing (Valdez and Mehrabian, 1994), also exists. Exploring this aspect presents a promising opportunity for further investigation within this project.

Current applications of AI in the fashion industry primarily focus on enhancing sensory appeal and boosting consumer retention. However, **there is an opportunity to explore how generative AI art interventions can be leveraged to address environmental issues** within this sector. Therefore this gap brings potential of investigation towards generative art to address environmental issues for connecting emotionally with audiences and driving responsible decision-making.

**The ultimate aim of this project was to create a proof of concept for an AI-driven interactive display that encourages consumers in fast fashion stores to recognize their behaviors and motivates them to consider alternative actions**. The primary contribution of this study lies in leveraging AI to enhance the effectiveness of the intervention. The other effects mentioned above are enhanced by the AI, which can be used to refine and improve the design of future interventions. From all the data presented and in alignment with Warburton's perspective, **this research aimed to answer the main research question on:**

**How can generative AI art in image form stimulate fast fashion consumers in stores to raise awareness about consumption consequences?**

From this main question, two sub-questions were formulated:

What are the most impactful aesthetic element combinations (saturation: color; black and white / perspective distance: zoom-in; zoom-out) that contribute to capturing consumer attention?

How do AI generated images compare to traditional images in terms of capturing attention and prompting reflection towards more environmentally mindful clothing consumption?

The first subquestion addresses the relationship between AI generated art in the form of images and increasing attention and awareness. The second subquestion addresses the relationship between

increasing attention and awareness through AI generated art and raising reflection.

Given the growing urgency for enhanced accountability and ethical practices across the supply chain, alongside the EU's climate neutrality goal for 2050 (European Green Deal, 2020), raising consumer awareness has become essential. The increasing implementation of government policies further underscores the need for action. In light of these developments, **the research questions formulated aimed to investigate two sets of experimental hypotheses through two studies: one central to this research and the other subsidiary.**

To standardize the specific aesthetic qualities of saturation and framing for use in the main study, a **pre-study was conducted to evaluate the capacity of the images to capture attention from participants.** Based on this, these images were used in the main study of the research, which seeked to compare AI-generated images with traditional images. Therefore, **Study 1 was conducted to ensure the absence of biases**. The same aesthetic qualities were to be used in both treatment types of Study 2, concerning saturation and framing, providing participants with images that had the same aesthetic elements, regardless of the mode of production (AI or traditional). Therefore, the hypotheses for experimental study 1 were:

**Experimental Study 1**

**H1** Color images capture people's attention more than Black and White images.
**H2** Zoom-in images capture people's attention more than Zoom-out images.

The main study (experimental study 2) builds on the foundation established by Demmer et al. (2023), as previously discussed, which suggests that computer-generated images evoke emotions and intentions in the same way as traditional art forms and participants do not notice the difference. Given that the mode of production is not the primary factor, it is plausible to consider that, since AI enhances computational capabilities, AI-generated images could potentially provoke a greater effect—such as inducing more reflection and capturing more emotion—compared to traditional images. Therefore, **this study aims to compare AI-derived images with traditional images to assess their relative potential to inspire societal change**. Therefore, following this rationale the hypotheses for this study were:

**Experimental Study 2**

**H1** Generative AI images capture people's attention more than traditional images.
**H2** Generative AI images induce more reflection than traditional images.

The detailed description and results of these studies can be found in Chapters 5 and 6.

After reviewing and analyzing previous studies, it is time to explore the behaviors of consumers targeted in this project, identifying the audience for future developments.

# Chapter 3

# The Consumers

In this chapter, discover the three distinct consumer typologies developed from insights gained through interviews conducted as part of the research. These typologies serve as a foundational framework for understanding how different consumer behaviors and mindsets shape the design concept presented in Chapter 5 and its societal implementation, discussed in Chapter 6. By delineating these consumer typologies, the chapter explores how different perspectives and behaviors influence the acceptance and integration of new design concepts within the fast fashion industry.

# 3.1 Method

## 3.1.1 Data Collection

### Participants

Building upon the foundational understanding of how individuals navigate their choices and the diverse strategies prevalent in the market towards more sustainable behaviors, eleven (11) in-depth semi-structured interviews were conducted. All interviews were in-person and in English. Fast fashion physical shoppers aged 24-30, evenly split between genders, all of whom were Master of Science students were chosen as the sample. This demographic was chosen due to the following reasons:

- age range: behavioral focus as fast fashion is often associated with younger demographics
- educational background: are more likely to be familiar with the term and actively participate in fast fashion consumption as fast fashion is catered to people of all backgrounds.
- gender representation: ensuring a balanced capture in potential differences of shopping behaviors and preferences

The recruitment followed a network sampling strategy where the participants were contacted via suggestions from the researcher's own personal network. Qualitative interviews were chosen at this first stage of the research as this methodological approach is more suited for collecting rich, detailed information about the subject.

### Procedure

The interviews aimed to achieve three main goals:

- Developing personas, for guiding the decision-making and comparison of the experience and its effects throughout the project.
- Identifying the target audience, as knowing who the key consumers are, that need more triggers to change, will ensure a more effective tailoring of the sustainable fashion experience.
- And identifying the store placement for the experience to be designed, in order to define which is the optimal location to have maximum visibility and engagement from consumers.

The interviews were recorded and had a duration of around 20 minutes and participants followed a 3-step process. Firstly they were asked to share their preferences in shopping for clothing, e.g., how often they shop, if they have pleasure in shopping, and what stores they usually go to. Then, they were given a paper and pen and were asked to draw their experience within a fashion store. In parallel with drawing, they were asked to guide their journey verbally to the researcher. Finally, they received another paper and were tasked to draw their emotions journey map, from arriving to leaving the store. Again they were requested to indicate their thought process as they drew the graph and what were the critical moments of that journey. In both drawing tasks, follow-up questions were asked, e.g., if they went to try the clothes but encountered a queue at the entrance of the fitting room, how would they react to it.

## 3.1.2 Data Analysis

The interviews were all transcribed *verbatim*, then replayed and checked manually for grammatical errors. Participants identities were anonymized by giving them numeric code pseudonyms, e.g., Participant #1, Participant #2, etc. After each interview was transcribed, the recordings were deleted.

The data was guided by thematic analysis (Braun et.al, 2023), where themes specific to the objectives of this study were developed. The visualization tool used for organization and coding of the interviews was Figma. The step by step process for the analysis went as follows:

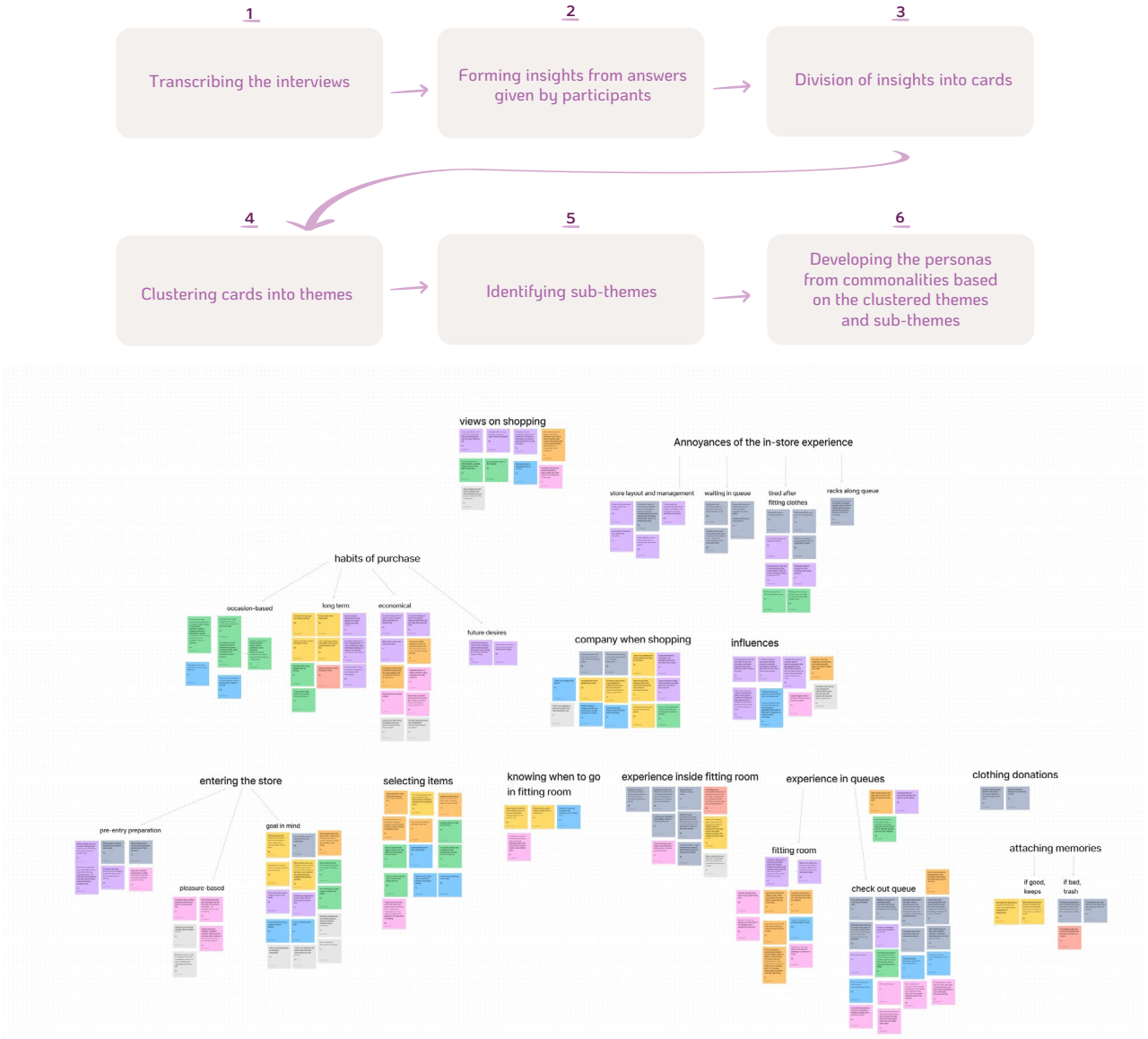



*Fig. 16. Top-center: step by step process for data analysis method of interviews. Bottom-center: Overview of the clusters developed during the thematic analysis.*

The insights and themes from the interviews, used in developing the personas characterization, lead to the development of elements for visualizing the personas identity. Firstly, a user journey (McKinsey Quarterly, 2015) was developed for each persona. Then, an in-store service blueprint (Bitner, MJ. et al., 2015; Yong, K. et al., 2024), presented in Chapter 4, was visualized containing the elements of the user journey from each persona. Thirdly, an empathy map (Bland, D., 2012; Ferreira, B. et al., 2015) was created to visualize how each persona felt, said, thought and did. In addition to those, shopping behavior insights and values were added to the map. And finally, an emotion map (Sykora, M. et al., 2022) for each persona was created, from insights of the maps drawn by the interviewees.

# 3.2 Persona Development

Based on insights extracted from interviews, **three distinct types of fast fashion consumers were developed**. The Dual Processing theory guided this categorization process, recognizing the varying cognitive approaches individuals employ when shopping for clothing.

To define the traces of each persona, the characteristics obtained through the answers were grouped by criteria such as their cooccurrence, answer contrast, and frequency. For instance, participants that answered that they went inside the store with a goal in mind, also answered that they continued to queue in both the fitting room and check out. People that answered that they love shopping, didn't answer that they planned a day for it, and vice versa. According to this grouping, three patterns emerged, giving rise to the corresponding personas.

## The Endless Fashion Hunters (EFH)

*Persona 1 – The Embodiment of System 1 Processing*


*Fig. 17. AI-generated image by DreamGen using prompt "Overconsumer, Rotterdam-based girl, Lifestyle Influencer, does impulse buying, driven by trends".*

22 years old
Lives in Rotterdam
Works as a Lifestyle Influencer

*Meet Riley!* She is an example of a EFH, driven by the thrill of the hunt and the desire to acquire a large quantity of fashion items. Commonly known as overconsumers and shopaholics, she views shopping as an obsession. If she goes to a store, she needs to buy, it does not matter if she already has a similar item. She adores being on the lookout for the latest trends and must-have items, like seeking new treasures to add to their ever-expanding collection. Just as a hunter relentlessly pursues their prey, this persona shows a similar determination and dedication to the pursuit of fashion excellence.

### Reaction to queues:

If confronted by a long wait to enter the fitting room, they might not wait and instead try the item outside the fitting area. However, if they love the item, they will wait. At the checkout, if the queue is long, they will evaluate whether it makes sense to buy the item. They will probably either wait or decide to purchase the item online.

### Decision-making process of purchase:

Making the decision to purchase item(s) often happens spontaneously. This persona frequently makes spur-of-the-moment purchases without a clear plan or intention beforehand, deciding on the go. Sometimes they don't even try the items in the fitting room, opting instead to get the items and proceed directly to checkout.

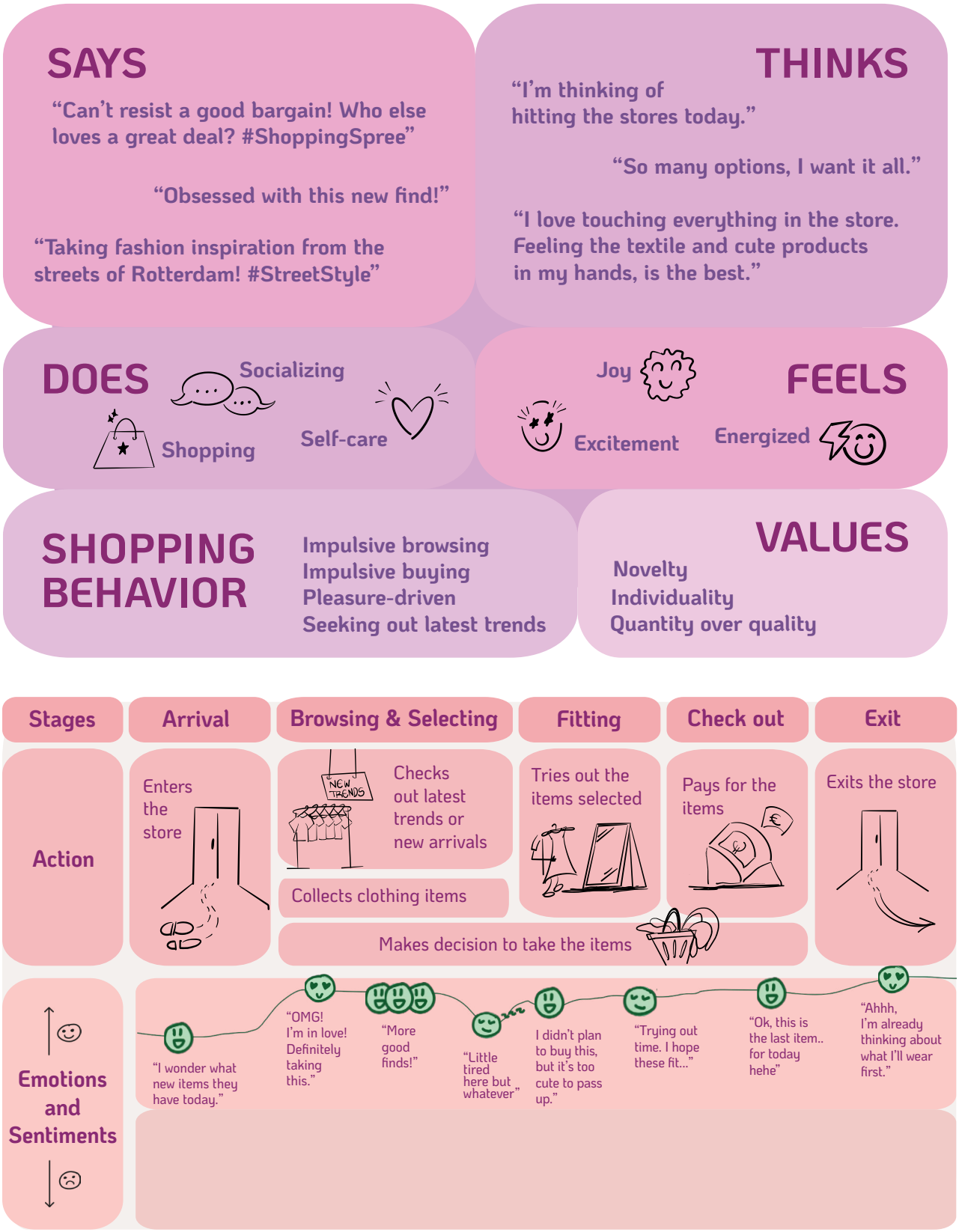



*Fig. 18. Overview of persona 1 characteristics.*

*Top image: Empathy map, adapted by the author. Bottom image: customer journey map and emotion journey.*

## The Shopper for Experience (S4E)

*Persona 2 – Bridging the Gap Between System 1 and System 2 Processing*


*Fig. 19. AI-generated image by DreamGen using prompt "Clothing experience consumer, based in Haarlem, Data Scientist, late 30's, enjoys traveling, values quality over quantity when shopping."*

35 years old
Lives in Haarlem
Works as a Data Scientist

*Meet Taylor!* Going shopping with something in mind but viewing shopping as an experience, she is open to exploring the store and seeks to go around its every corner. This user is pleasure-based, values the experiential aspect of shopping and enjoys exploring different options. They approach shopping with a critical mindset, carefully considering whether each potential purchase aligns with their personal style, needs, and budget. They strive to maintain a balance between indulgence and practicality, making thoughtful decisions about what they truly need and avoiding excessive or impulsive purchases. They value shopping experiences that create lasting memories, especially when shopping in other cities or countries, viewing their clothing purchases as souvenirs of their travels.

### Reaction to queues:

When faced with long queues or crowded stores, Taylor prioritizes their time by choosing to return later or extending their visit to avoid rush hours, ensuring a more relaxed shopping experience. If they select an item for fitting, they tend to wait in the queue. After deciding which items to purchase, they proceed to the checkout. If the queue is long, they might walk around or visit other fast fashion stores to compare similar items and prices.

### Decision-making process of purchase:

#### *Inside the fitting room:*

While trying on clothes, this persona takes time to evaluate their options. They tend to take a pile of clothes and spend a significant amount of time deciding which items to keep.

#### *After the fitting room and before checkout:*

If still unsure about the items, they walk around the shop to make a final decision. They find that "walking helps me think."

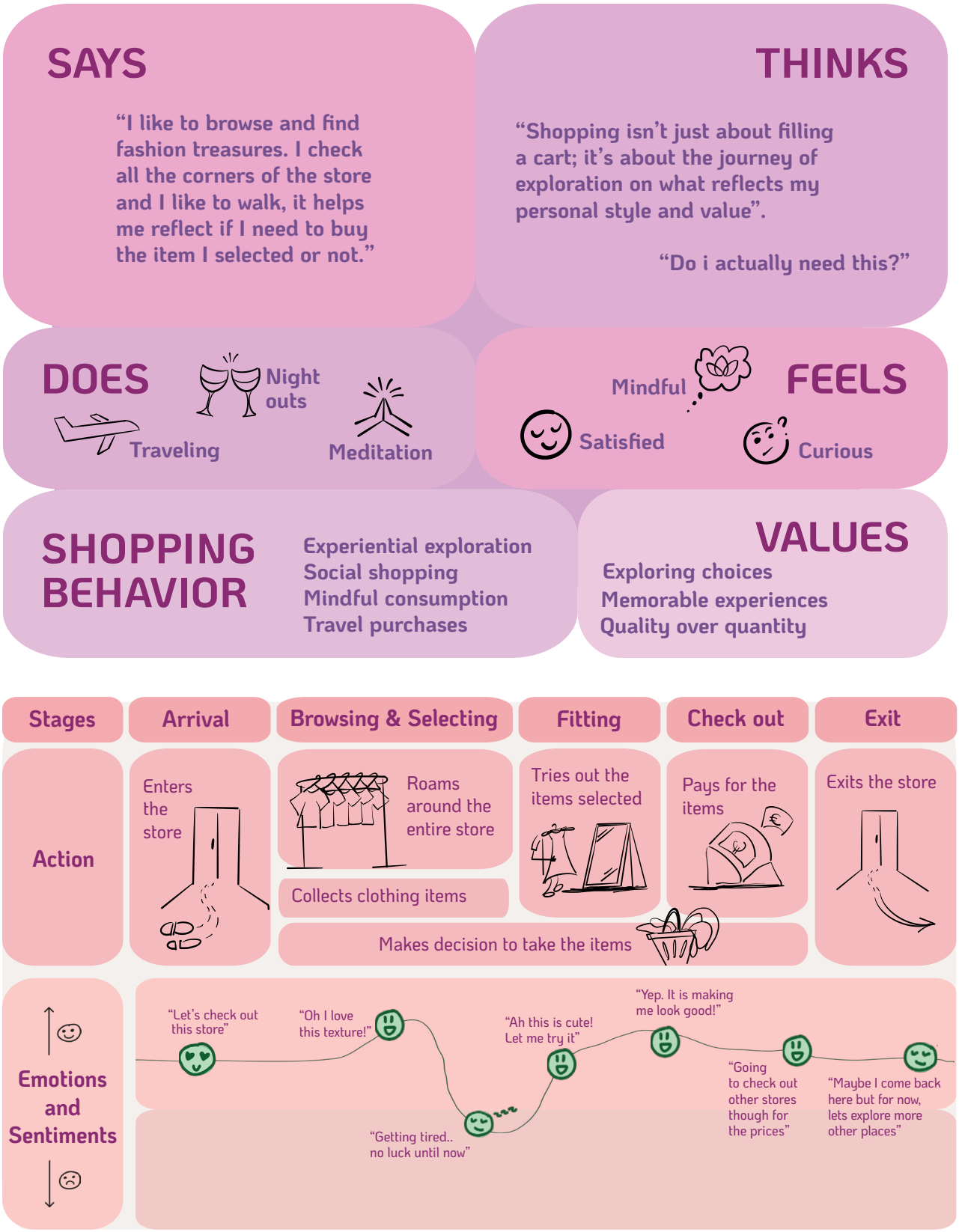



*Fig. 20. Overview of persona 2 characteristics.*

*Top image: Empathy map, adapted by the author. Bottom image: customer journey map and emotion journey.*

## The Mission Minded Matchmaker

*Persona 3 – Driven by System 2 Processing*


*Fig. 21. AI-generated image by DreamGen using prompt: AI-generated image by DreamGen using prompt "Goal oriented shopper, lives in Leiden, Project Manager professional, methodological thinker, active on sports".*

29 years old
Lives in Leiden
Works as a Project Manager

*Meet Cameron!* A goal-oriented, determined and need-based consumer. He is the type of user that buys only what he/she needs, and seeks efficiency and practicality in their shopping experience but is open to browsing for finding the best match. From Maslow's hierarchy of needs it is evident that this persona is already on the top of the pyramid in terms of being self-aware and weighing their options when making decisions. May welcome assistance from knowledgeable staff to expedite their shopping trip and may shop with a company who knows their style and that can help them find the right items, efficiently.

### Reaction to queues:

Cameron tends to shop with determination. If he/she selects an item they like, he/she will proceed to the fitting room to try it on. If there is a long queue, he/she will wait patiently. The same applies to the checkout process. Having gone to the shop with a specific intention, Cameron feels that his time would be wasted if he does not purchase the item he came for.

### Decision-making process of purchase:

When collecting the clothes in their hands, this persona only gets what he/she needs. In the fitting room, he/she officializes his/her decision but wants to be quick in deciding.

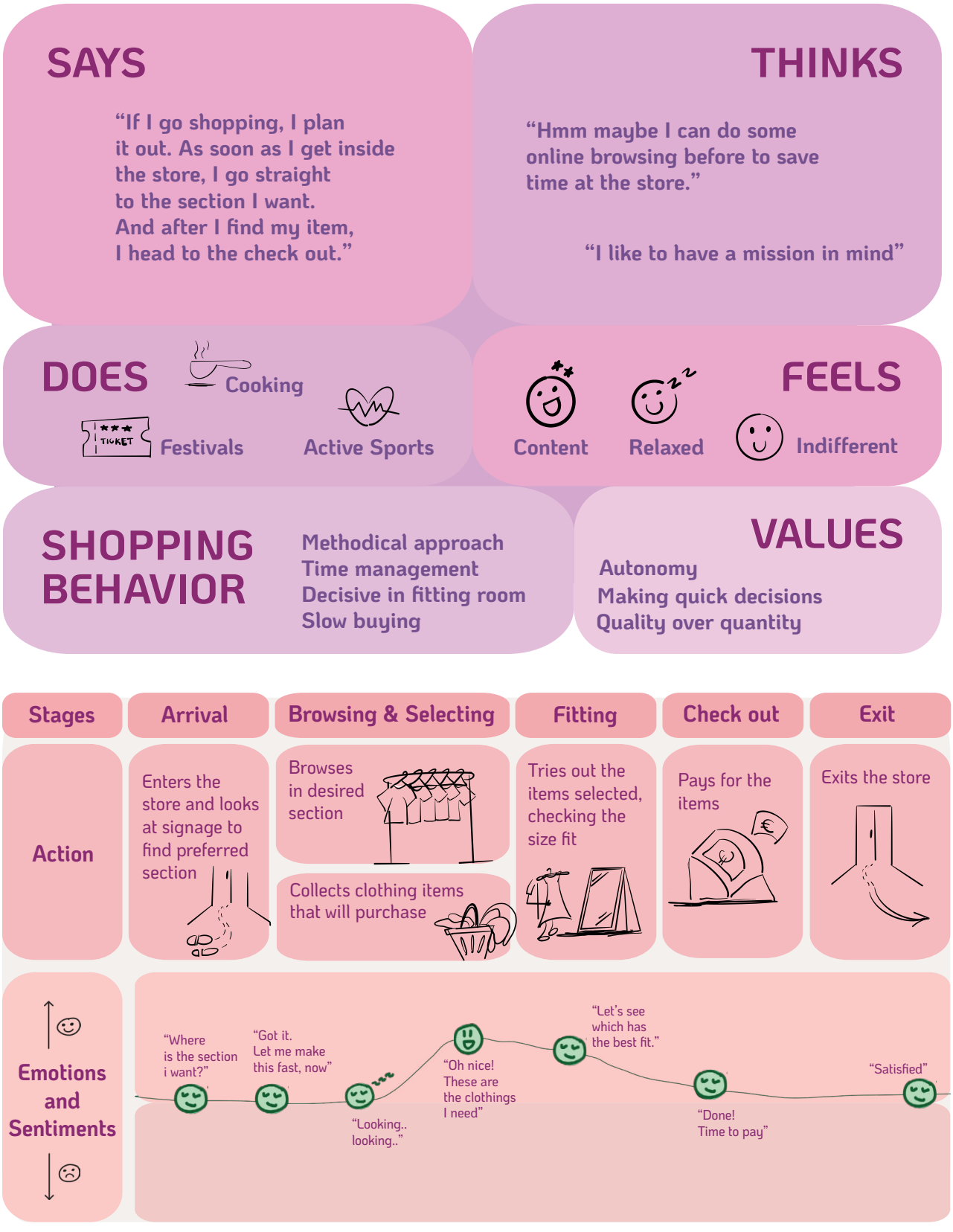



*Fig. 22. Overview of persona 3 characteristics.*

*Top image: Empathy map, adapted by the author. Bottom image: customer journey map and emotion journey.*

| Persona | Quotes from the interviews on different moments of shopping experience | | | |
|---|---|---|---|---|
| | Before entering the store | After entering the store | Experience with queues | Decision to purchase items |
| **The Endless Fashion Hunters** | *“Usually when I go shopping, it happens randomly. I walk around in the street with no plan and then if I find a cute shop or one that I like, I go in.”* | *“After entering the store, I like to go in a zig zag, from the right side of the store to its entirety. I really like to do physical shopping... I like to feel the product.”* | *"If the fitting room queue is long, I try outside it. But if the purchase area queue is too long, then I will evaluate if the clothing is needed and if I want it too much."* | *"If the clothing does not look good on my body, I might still take it because I want to feel that in the future I will be able to use it."* |
| **The Shopper for Experience** | *"I do a lot of window shopping."* | *"After entering the store, I go straight to the section I want and I like to just wander around in all the sections to see what is new. I want to see everything that is available before getting anything."* | *"I usually get a variety of items to fit, so I just wait. But in the queue for purchasing, I consider options: 1) If I like it, I stay in the queue, 2) If I know there are similar options in other shops, I leave and I go to a similar one to check the price, 3) If I am hungry or tired, I leave the queue and I come back later."* | *"After deciding what to buy, I go back to the section that I like and I check out other stuff."* |
| **The Mission Minded Matchmaker** | *"I set out a day for shopping. So before entering the store, I check out the name and opening times. That is important."* | *"After entering the store, I go straight to the section that I need."* | *"If I made my choice, then I usually decide to wait in the queues. It doesn't matter if it's the fitting or check out."* | *"Everytime I go shopping, I want to have purchased something. Otherwise it feels like a waste of my time. Especially because I do not enjoy shopping."* |

*Table 5. Overview of what participants said and main stages in the store, identified from thematic analysis.*

# 3.3 Target Audience


## The Endless Fashion Hunter

For this project, there is much potential in helping this group to raise awareness of their consumption habits. **Being over-consumers, constantly on the lookout for going shopping and following desires more than mind, this persona may not always be conscious of the socio-environmental impact of their shopping habits.** Therefore, showcasing AI-generated artworks that visually depict environmental issues related to fashion can enhance their consciousness on the consequences of overconsumption. Hopefully it will inspire change and spark curiosity in engaging in the topic.

### *Customer Base*

*By understanding the System 1 mindset,* ***Persona 3: The Mission Minded Matchmaker serves as the user base for this project.*** *This persona provides insights into where the target users, particularly over consumers, might transition towards if this project's generative AI art experience becomes implemented in the future.*


# 3.4 Product Placement

The third goal of the interview study was to identify potential locations within the store where the designed experience could be strategically placed. From the experience maps and the emotion journeys collected from the interviews, a service blueprint from the shopping experience was developed, specifically for the EFH's (Fig. 26). Overall, participants highlighted that many enjoy walking in stores because it helps them reflect, suggesting that transition zones would be advantageous locations. Additionally, indications went to placements near the fitting rooms, as interviewees mentioned that waiting in queues prompts them to consider whether they will purchase an item or not.

Particularly for Endless Fashion Hunters, the target audience in this project, **the ideal location seems to be near the New Arrivals sections as participants specifically indicated that they often go straight to the trend section when shopping**. This insight brings the importance of integrating trend-focused elements into the project's design, aligning closely with Persona 1's preferences and needs.

**Prime location selected** within the store

DESIG

# GNING

Let's dive into creative magic! This section is all about crafting our selections. By translating the meaning of crafting selections into design research, we're taking insights from the previous chapters to fuel the concept in detail.

# Chapter 4

# The Designed Experience

In this chapter, we delve into the development of the research experience, starting with an exploration of the methods used to create the concept. We then introduce the intervention, outlining the design guidelines, key insights that informed the intervention, and its core design features, with a particular focus on the visual arts aspect. The chapter concludes with a service blueprint that illustrates how the concept is brought to life, placing the target audience at the heart of the experience.

# 4.1 Method

Vision in Product design (ViP; Hekkert & van Dijk, 2011) framework guided the process, transforming empirical data into principles for shaping the generative AI art interactive display. Using the ViP framework, insights from the literature research, and the interviews employed, the concept was developed for further assessment in the next chapters.

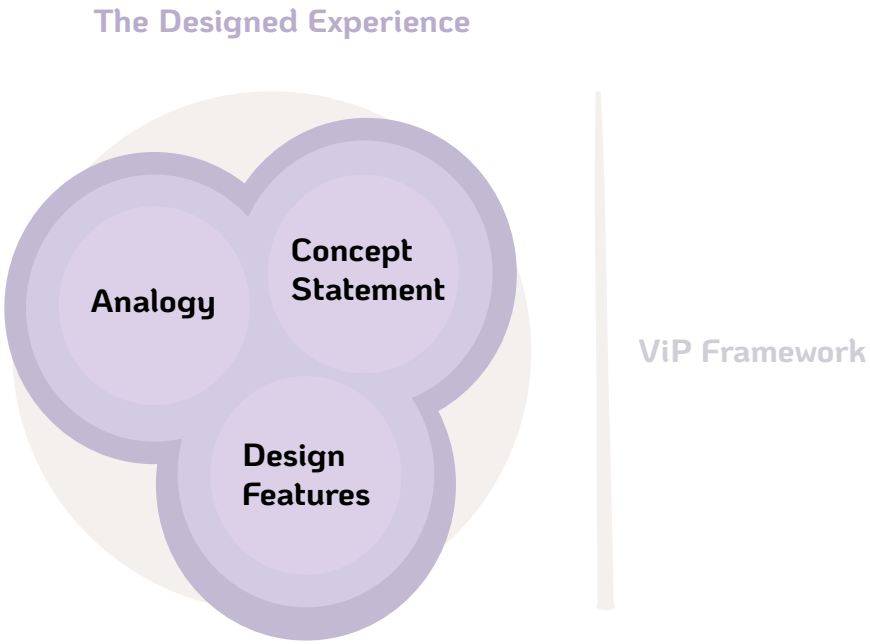



*Figure 23. Main elements used for developing concept, adapted from the ViP framework process steps from elective Vision in Product Design (TU Delft | 2023)*

The ViP framework uncovers the implicit meanings within artifacts, services, and systems, extending beyond user needs (Tromp & Hekkert, 2014). The steps include selecting a project domain, developing research-based factors, clustering these factors into themes, developing a worldview, delineating a statement, creating an analogy, and conceptualizing different future design solutions (Hekkert & Van Dijk, 2010, cited in Singh & Tromp, 2011).

The first figure (Fig. 23) illustrates the steps taken in this graduation project, focusing on delineating a statement, creating an analogy, and ideating a concept. This framework was first learned in an elective course, Vision in Product Design, taken the quarter prior to the commencement of the graduation project in 2023. For that elective, the same domain was chosen to explore how the method could be applied in-depth for this long-term project, as shown in Fig. 24. While the earlier chapters covered the initial steps, this chapter will focus on the last three steps of the framework.

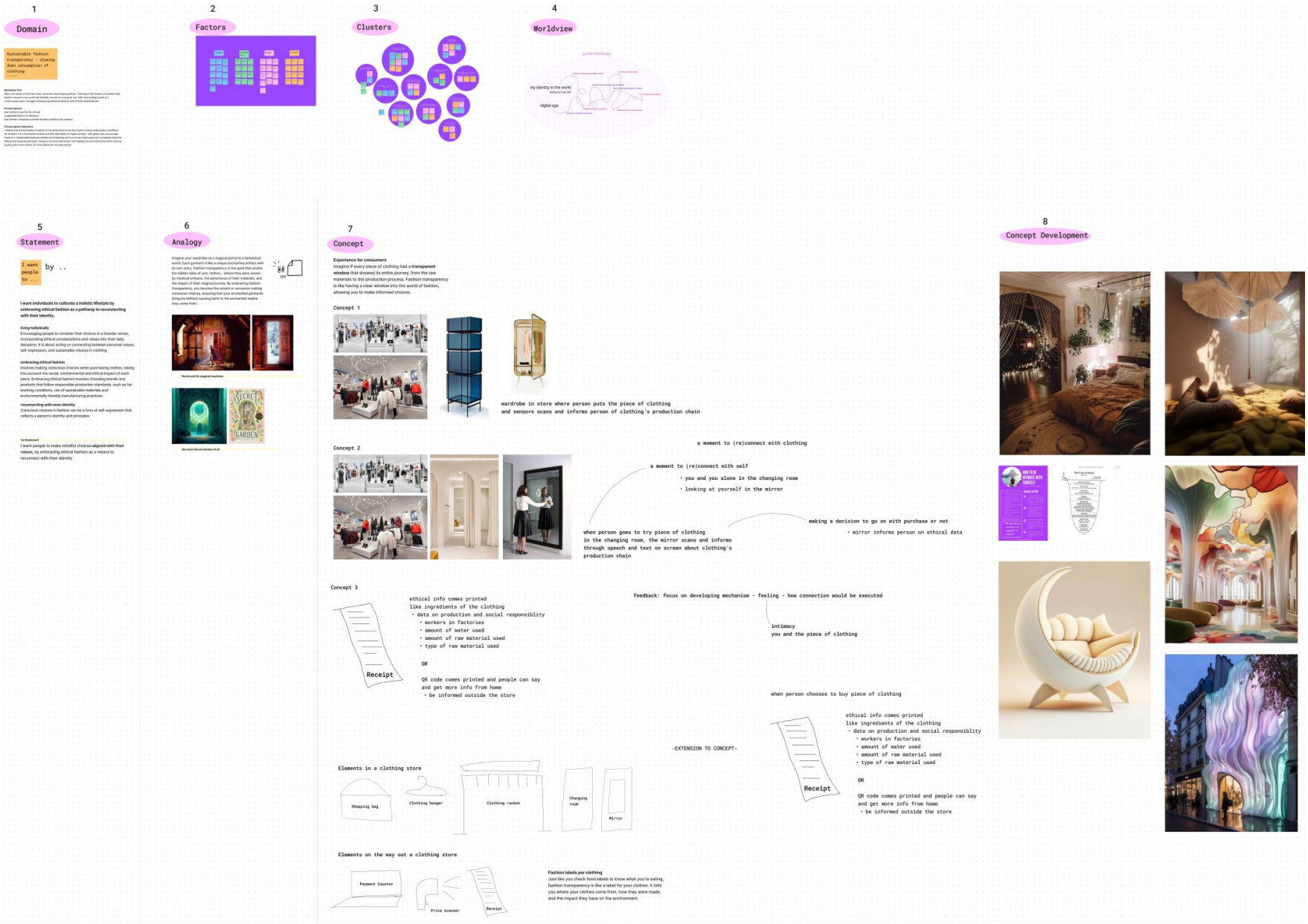



*Fig. 24 Concept details from using specific steps from the ViP framework*

# 4.2 Key insights for creating the concept

To delve into the details of the concept, understanding the foundational insights that guided the approach is needed. With that, building upon the takeaways from the previous chapters, combining the main insights from the interviews and the previous studies for an evidence-based approach, Table 6 highlights the key insights instrumental in shaping the designed concept. The colored table highlights indicate two different kinds of insight: the **service experience** (in orange) and the **visual art aspect** (in pink-purple) of the concept.

| Source | Key Insights identified | Application of insights |
|---|---|---|
| **Chapter 1** | "The lack of transparency in fast fashion brands about clothing origins leads to labor exploitation and environmental degradation." | **Using facts into text and/or visual form, to ensure transparency.** The proposed service partners with fashion brands to use supply chain data, ensuring transparency by providing accurate, up-to-date information about clothing origins, building trust and accountability in the industry. |
| **Chapter 2** | Habit formation is extra important in consumer behavior and that happens through repeat of actions. | **To encourage habit formation, the AI display will feature repeated actions** like daily sustainability tips, interactive visual stories on socio-environmental impact, and fact displays. It will also connect to a website where consumers can track their progress and hear from favorite designers about fashion's reality. |
| | Construal Level Theory helps structure messages by shortening psychological distance through closer associations, which influences behavior. | To enhance user interaction and connection, the AI display will use Construal Level Theory principles, such as actionable language for sustainability tips and challenges, and highlighting the immediate benefits and impacts of sustainable actions. |
| | Information on resource scarcity can drive people to choose environmentally friendly options. | **Utilize natural resource scarcity,** such as water, raw materials, and energy, **as part of image content.** |
| | Knowledge-based consumption encourages belief-challenging, critical assessment, and fosters responsible intentions. | Integrate factual information on fast fashion, including environmental impact and other relevant factors, through text and images to empower consumers to make informed, conscientious purchasing decisions. |

| | | |
|---|---|---|
| | Loss-framed messages are more effective in influencing behavior by highlighting potential risks of inaction. | Integrate loss-framed messages into the visual AI-generated content. The visual arts may also emphasize the loss-frame through representation of fast fashion consequences. |
| | When information aligns with consumer interests and is attention-grabbing, it can prompt new behaviors in routine situations like shopping for clothing. | Use selective attention and stimuli salience by incorporating specific visual elements to attract attention and highlight key sustainability features or ethical practices of the clothing items. |
| | "Art serves as a powerful tool for communication, expression, and societal change." | Use images as visual art and extend the display to a website or users' smartphones, allowing continued engagement beyond the store and into daily life. |
| | Visual art comprises color, framing and imagery. | Images in the concept will have aesthetic qualities for direct impact in users. |
| | Integrating digital art into physical spaces can reshape consumer perceptions. | The intervention will be placed inside fast fashion stores. |
| | A well-structured prompt produces high quality image generations. | The AI images will be generated with well-structured prompts. |
| **Chapter 3** | For Endless Fashion Hunters, the ideal location is near the New Arrivals section, where they typically go straight to find trends. | Install interactive displays or digital screens near the New Arrivals or trend sections, targeting the Endless Fashion Hunters audience. |
| | Walking through the store helps customers to look for path or evaluate choices. It aids decision-making for Systems 1 and 2. | Integrate a feature in the display that invites users to walk through aisles to make decisions. This interactive element enhances engagement and supports both spontaneous and deliberate decision-making styles. |
| | Talking to friends, family, or store personnel while shopping helps guide users. | The intervention AI display can serve as a shopping buddy, allowing customers to ask questions or select options and receive answers and tips. |

*Table 6. A summary of different insights from the previous chapters taken for concept development. Highlighted in orange are insights for application in service experience and in pink-purple are for incorporating in the visual art aspect of the concept.*

This **set of insights served as the basis for creating the design guidelines** for each specific aspect of the intervention. A summary of these guidelines is as follows.

### Service Experience

- Use factual data to ensure transparency in text and visual forms.
- Design repeated engagement actions to encourage habit formation.
- Place interventions within fast fashion stores for maximum effect.
- Position displays near New Arrivals or trend sections in stores.
- Integrate interactive features that promote thoughtful shopping.
- Create AI displays that act as interactive shopping buddies.

### Visual Art Aspect

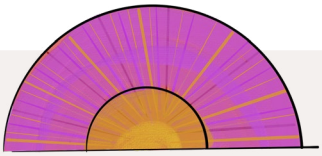
- Apply CLT principles to enhance user interaction.
- Utilize images of resource scarcity to emphasize sustainability.
- Integrate factual information about fast fashion to inform consumers.
- Incorporate loss-framed messages in visual content.
- Use attention-grabbing visual elements to highlight sustainability.
- Implement visual art and extend engagement through digital means.
- Ensure images have aesthetic qualities for direct user impact.
- Generate AI images with well-structured prompts.

## Concept Statement:

**I want Endless Fashion Hunters to become aware of their consumption during their shopping journey by interacting with an AI-generated art display that shows the environmental impact of fast fashion overconsumption.**

By becoming aware of their own consumption, it is meant that while engaging with the display, they pause, reflect, and experience a transformative moment. The visually captivating and informative content aims to make transparent to consumers the practices within the fashion brand, their practices on enhancing sustainability, and the broader impact of fast fashion overconsumption on the environment. **Imagine giving customers the ability to slow down and become transported by artistic statements that seamlessly marry technology and design to create a moment of reflective attitude.**

## Analogy:



**The light is at the end of the tunnel.**

The **tunnel refers to the fast fashion industry**, the **end symbolizes the potential for change** and improvement, and the **light represents the transformative insight** and positive impact achievable through increased awareness and sustainable choices.

# 4.3 The Intervention

The designed concept introduces an **AI interactive display strategically placed inside fast fashion stores**, adjacent to the Trend Section. This **display acts as a window into the reality of fashion**, inviting Endless Fashion Hunters to engage with it through a touch interface. Consumers interact by selecting questions that prompt the AI to generate custom images reflecting various aspects of fashion and sustainability.

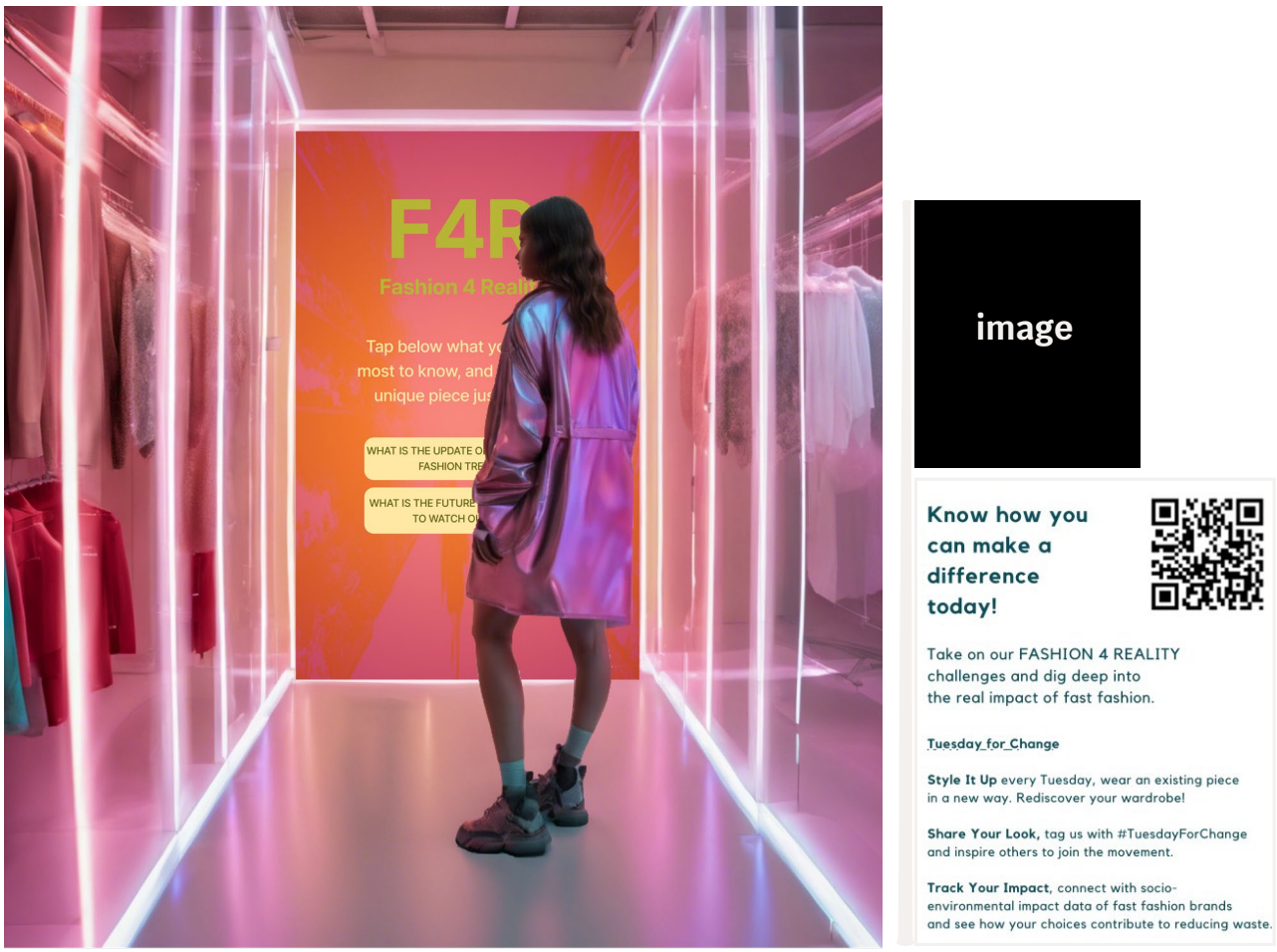



*Fig. 25 Left-side: Mockup featuring the AI interactive display installed in a store setting, showcasing the interface titled "F4R: Fashion 4 Reality." The screen invites users with the message: "Tap below what you desire most to know, and I'll reveal a unique piece just for you!". Right: Message with QR code visible after consumers receives the image from the AI display: user is invited to further action.*

This **initial engagement is both immediate and impactful**: the AI produces striking images of environmental consequences that captivate users' attention and evoke surprise. To extend this interaction beyond the store, each image includes a QR code, enabling consumers to download the images and participate afterwards in ongoing weekly challenges. These challenges are designed to foster deeper engagement and encourage users to integrate the experience into their regular shopping habits. By participating in these challenges, consumers receive a reinforcement of stimuli and develop a routine of interaction and are becoming more likely to adopt behavior changes aligned with sustainability goals. This dual approach—immediate visual impact followed by long-term engagement—creates a comprehensive experience that promotes ongoing involvement and habit formation.

## 4.3.1 Concept design framework

This framework outlines how the interactive platform functions structurally to engage Endless Fashion Hunters with AI-generated art and impact data on fast fashion overconsumption. It defines the architecture and user experience flow that facilitate consumer reflection and awareness during their shopping journey.

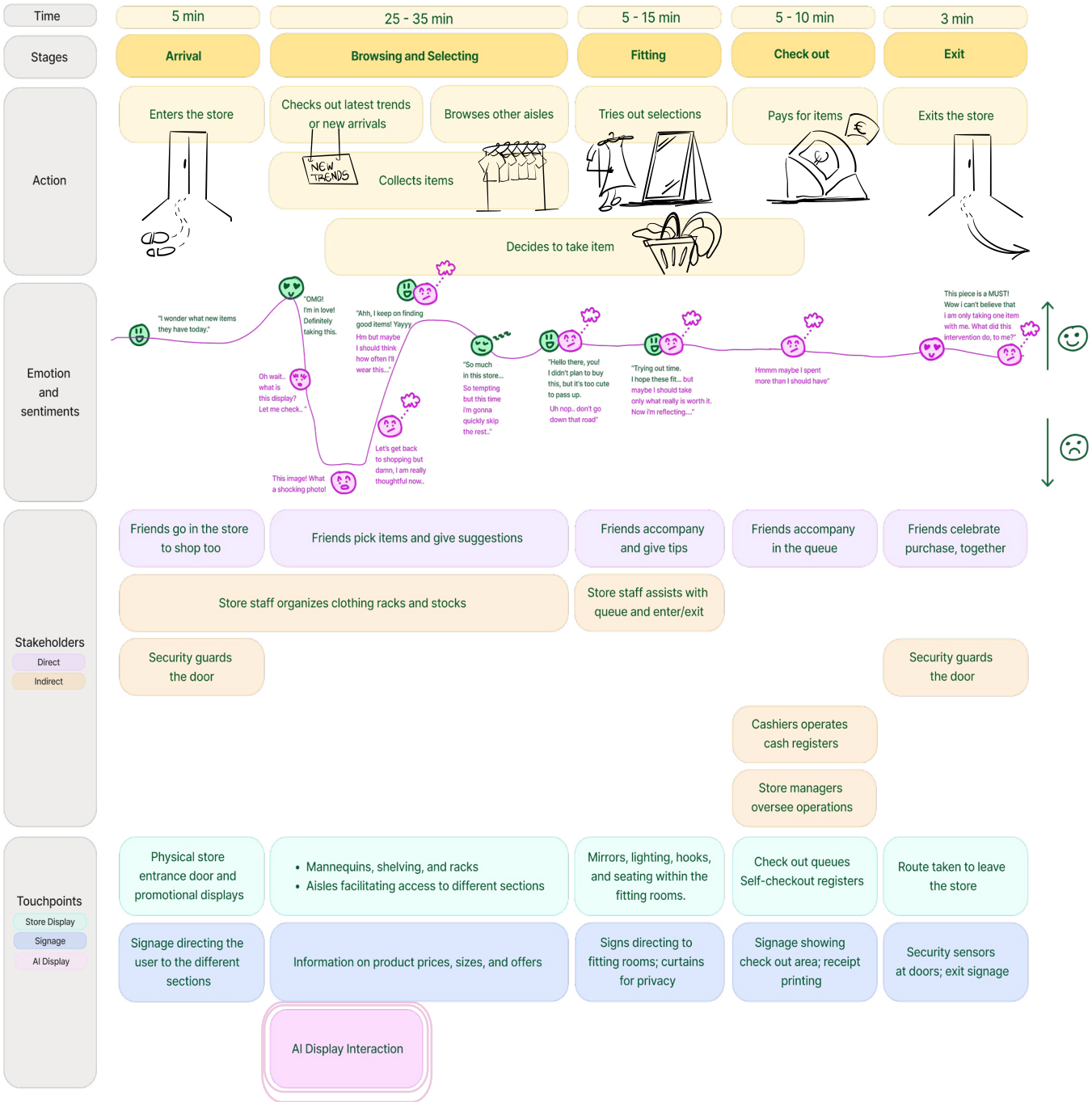



*Figure 26. Service blueprint of EFH shopping experience with the implementation of the designed concept as a touchpoint.*

## 4.3.2 Visual Art Aspect

The **design criteria of the image aspect is informed by consumer behavior theories and strategies**. The interactive platform will be grounded on the Construal Level Theory, for provoking emotions on users as they empathize with the artworks presented on the screen, grounded on the Model of Automatic Processes for its interaction experience, and on the Green demarketing strategy in combination with TRA and Prospect Theory, for the prompt used to generate images. In Table 7, a detailed summary of how each theory will be applied to the concept can be seen.

| Theory | Concept | Implementation in intervention |
|---|---|---|
| **Construal Level Theory** | Using psychologically closer elements to decrease the distance between user and the environmental impacts caused by their purchasing choices.<br><br>Time, space, social connection, and hypotheticality. | **Elements composing the AI generated images**<br>**Time:** Real-time data on local environmental conditions (e.g., air quality, water levels) related to fashion impact.<br>**Space:** Context-specific imagery and localized messages. The display will adapt to reflect the store's local context, mirroring customers' routines. For example, in a Dutch fast fashion store, images might feature local animals and landmarks, like Delft Blauw pottery or local churches.<br>**Social Connection:** Messages highlighting social connections and community actions.<br>**Hypotheticality:** Artworks that feels both plausible and relevant to users. |
| | Egocentric perspective of the self. | Incorporated through the touch screen, this theory personalizes the experience with messages like "Welcome back, [Name]! Here's how you can make a difference today," and offers tactile feedback, such as subtle vibrations for sustainable options. |
| **Green Demarketing strategy** | Consumer perceptions are reframed, discouraging fast fashion consumption. | The prompts will ensure the display highlights the negative effects of fast fashion overconsumption and emphasizes the importance of sustainable practices. |
| **Theory of Reasoned Action** | People are more likely to engage in a behavior when it aligns with their beliefs, values, and social desirability. | The question prompts align sustainable behavior with desirable goals, highlighting the negative impacts of fast fashion - e.g. environmental harm and social injustices. |
| **Prospect theory** | People are more sensitive to potential losses than to equivalent gains. | Prompts frame potential losses, creating urgency and concern by making consumers weigh environmental issues against personal enjoyment. |

*Table 7. A summary of how each theory will be specifically applied in the image aspect.*

Having established the design features grounded in various behavioral theories to enhance visual engagement and emotional impact, we now shift our focus to how these design elements are integrated into the overall AI display intervention and experienced in real-world settings.

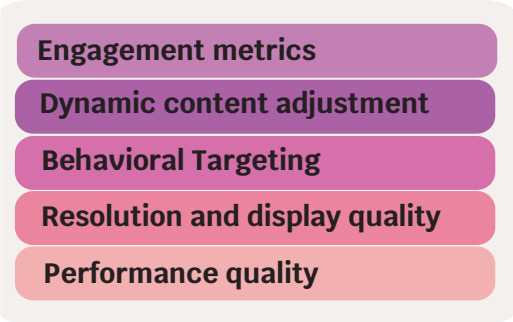
## 4.3.3 AI Display

The AI-generated art display offers a visual and emotional representation of the environmental impact of fast fashion overconsumption. Departing from conventional data displays that often rely on numerical information, **this concept utilizes narrative-driven imagery to forge a deeper connection between consumers and the realities of environmental degradation**. Through displaying the environmental degradation, this display enables consumers to perceive and experience the real consequences of their consumption choices, fostering a more authentic connection with the issues at hand.

The visual narrative approach of the art display aligns with the imperative for enhanced transparency and authentic sustainability efforts. It a**cts as a catalyst for both consumers and brands to address the deficiencies** highlighted in Pathak et al.'s study. By increasing consumer awareness and fostering a deeper engagement with environmental issues, the concept supports the broader objective of reconciling financial profit with genuine sustainable practices.

As demonstrated in the service blueprint in Fig. 27, the AI interactive display screen integrates visual cues such as animated illustrations and messages to draw the user closer. This setup encourages active participation, with the screen inviting users to interact via touch. The screen shows a series of questions that users can select from. It generates AI-driven insights and artworks as rewards supported by a diverse dataset including, both brand-specific and open-source information, that ensure an unbiased understanding of global sustainability issues. This approach delivers accurate, insightful outcomes, offering a holistic and immersive increased awareness in sustainable fashion practices.

The support processes of the AI interactive display involve critical components to ensure seamless operation and prevent issues such as overly negative AI-generated images, for example images that are too apocalyptic or with injured human figures. Specifically, data analytics, placed at different stages, encompasses engagement metrics, dynamic content adjustment, behavioral targeting, resolution and display quality and performance quality. The data collected will be anonymized and used only for aggregate analysis within the AI system in order to maintain user privacy. The specific details on each of these metrics is demonstrated in the blueprint, followed by explanation of each on the pgs. 78 and 79. Presented below is the color legend of the data analytic metrics, in order to visualize and better understand the blueprint.



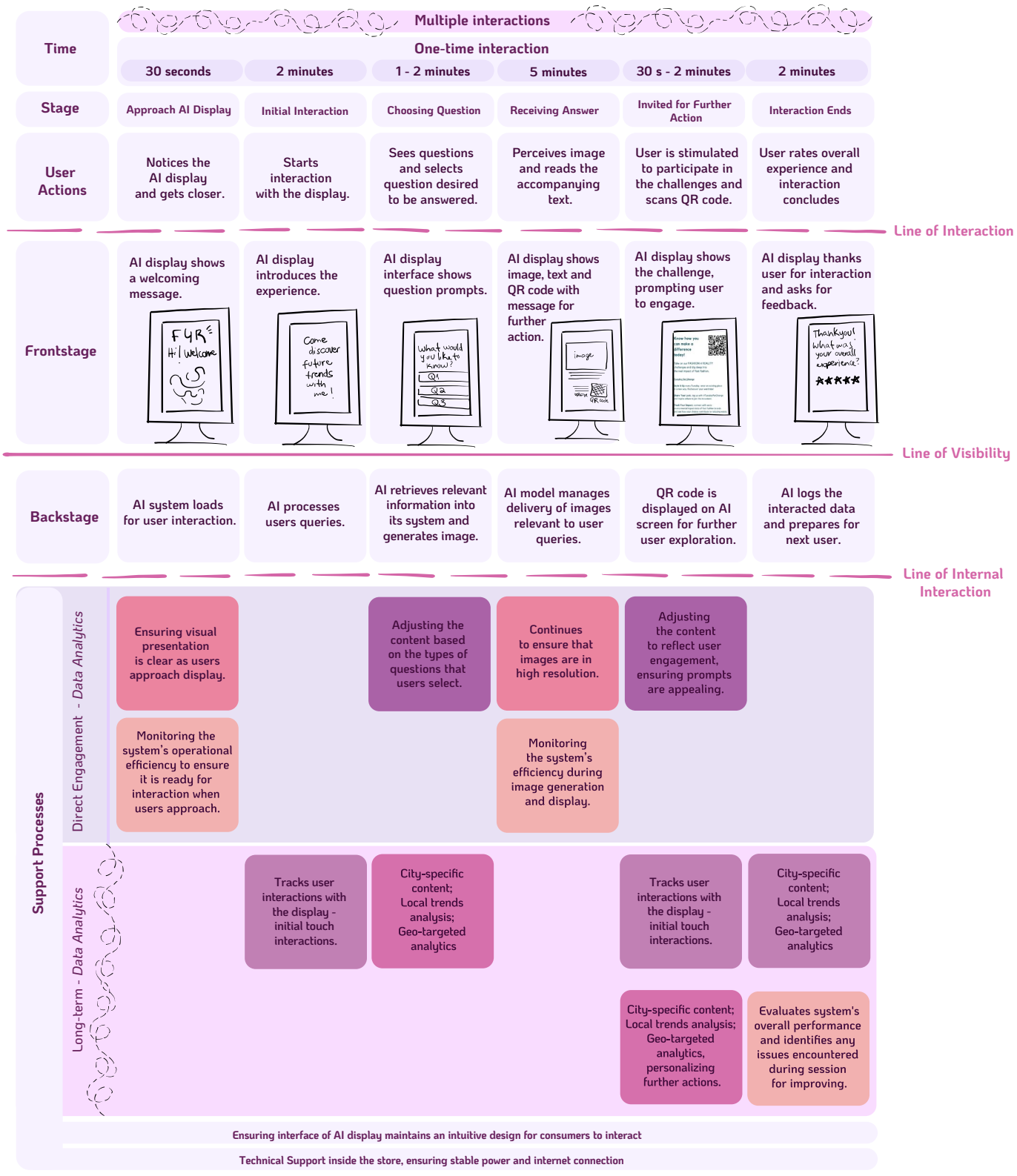
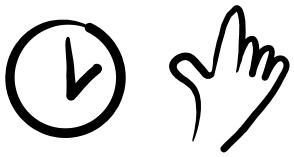



*Figure 27. Service blueprint of the designed concept, illustrating both single and multiple iterations over time. The first line at the top in pink displays Time for multiple interactions and corresponds to long-term support processes, shown also in pink in the bottom line. The second line at the top shows time displayed in seconds representing a single user interaction, connected to the direct engagement support processes highlighted in light violet, over the bottom of the figure. The Stages of the intervention, user actions, frontstage of the service and the backstage are displayed in very light purple. All of the support processes are displayed at the bottom of the blueprint, in violet and pink. Each colored box within the support processes section, represents one of the six different metrics collected by the AI display for data analytics.*

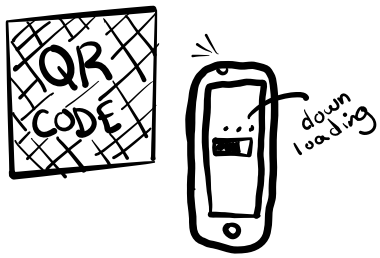
## Engagement metrics

**Will be implemented to track how consumers interact with the AI-generated display and their reactions to the elements shown**, as Sung et al (2021) demonstrates. These metrics are divided into two primary



**The first set** includes interaction metrics, such as **time and touch**. Time measures the duration of consumer engagement with the display, while touch tracks the number and types of interactions with the screen.

**The second set** focuses on **reactions to different types of images**, as emotional engagement is influenced by visual stimuli, aligning with the concept of emotional engagement discussed in the literature chapter. As images are displayed on screen, a QR code inviting participants to scan and participate in challenges is also displayed. So, by monitoring which images are downloaded onto participants' phones, support teams can gain further insights into which visuals attract consumers to engage more, beyond the experience in-store.

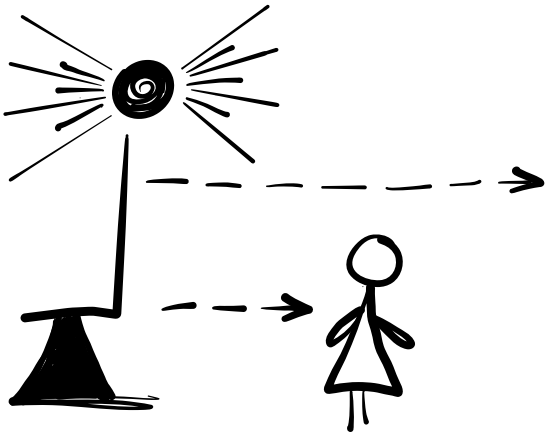



Additionally, participants are asked to provide feedback at the end of their experience with the display. This feedback includes questions like, "How much did you like the experience?" and "How useful was the experience to you?" where **participants provide star ratings to assess for their overall satisfaction**. The metrics collected are used to refine and enhance the display's design, ensuring it better meets consumer preferences and effectively communicates its intended messages, resulting in informing future iterations of the display. ★★★

## Dynamic content adjustment

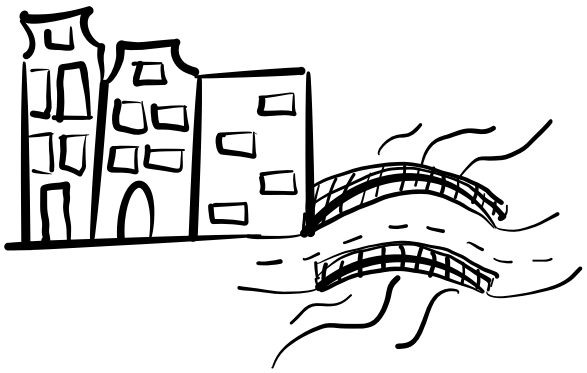
**Will be used to enhance the user experience through real-time data analysis and adaptive algorithms**. By implementing algorithms that adjust the displayed images based on real-time data from consumer interactions, the system can dynamically tailor content.

**Proximity sensors**, such as those using infrared or ultrasonic technology, will track how close consumers stand to the display, providing additional context about engagement levels. If consumers are standing closer to the display, a higher level of engagement is indicated.



## Behavioral Targeting

**Will be used to analyze past purchasing behavior and preferences to personalize the images shown to individual customers**. This approach is instrumental in lowering psychological distance by making the content more relevant and relatable to each user, aligning with findings from the literature review.

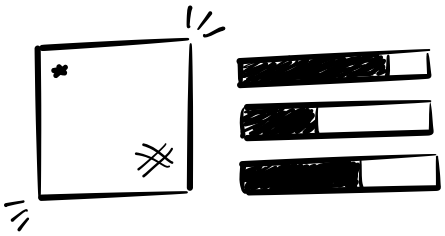


Specifically, **city-specific content** will involve integrating elements that reflect local landmarks, cultural symbols, and city-specific environmental features into the display. For example, in an Amsterdam store, the display could feature Dutch architecture or local fashion trends. By incorporating familiar local imagery, the display reduces psychological distance and enhances the connectedness of the content to the user, making it more engaging for consumers.

Moreover, **local trends analysis** will be done so that the AI uses data on local fashion trends and consumer preferences to adjust the images shown. If certain styles or colors are popular in a specific city, the display can highlight these trends. Finally, **geo-targeted analytics** using location-based data will help analyze how different types of content perform in various city areas. The display can adjust in real-time based on which content resonates most with local consumers.

## Resolution and display quality

Monitoring the quality of images displayed to ensure high resolution and clarity will be **executed through consistent continuous image quality checks and calibrations to uphold high resolution**.



## Performance quality

To guarantee smooth operation and uninterrupted service, the performance of the AI system is closely monitored. This involves **tracking key performance metrics**, including system uptime and response times. **Regular reviews and maintenance** are conducted to address any issues, while automated monitoring tools are employed to detect and resolve problems swiftly, ensuring the system functions efficiently at all times.

VALID

# ATING

Time to try out if there is proof for the concept. In this next section, the visual art aspect of the concept was tested as an experimental study to better understand its impact on consumers for triggering awareness.

# Chapter 5

# Experimental Studies

In this chapter, we delve into the experiments conducted to validate the concept introduced in Chapter 4. The aim of these experiments was to rigorously test the hypotheses and provide empirical evidence supporting the theoretical framework.

This chapter provides a detailed overview of the experiments, including the design decisions, methodologies employed, data collection processes, analysis techniques, and the results obtained.

# 5.1 Ensuring Study Consistency across both experiments

To address the central research question, **How can generative AI art in image form stimulate fast fashion consumers in stores to raise awareness about consumption consequences?**, the study was structured around two key sub-questions, explored through two sequential experiments.

The first sub-question investigated: **What are the most impactful aesthetic element combinations (saturation: color; black and white / perspective distance: zoom-in; zoom-out) that contribute to capturing consumer attention?** This inquiry was explored in Study 1, which focused on stimuli calibration to identify effective aesthetic elements.

The second sub-question examined: **How do generated images compare to traditional images in terms of capturing attention and prompting reflection towards more environmentally mindful clothing consumption?** Study 2 addressed this question by comparing the effects of generative AI images with traditional images on consumer attention and reflection.

Figure 28 illustrates how these studies align with the research questions and their respective objectives.

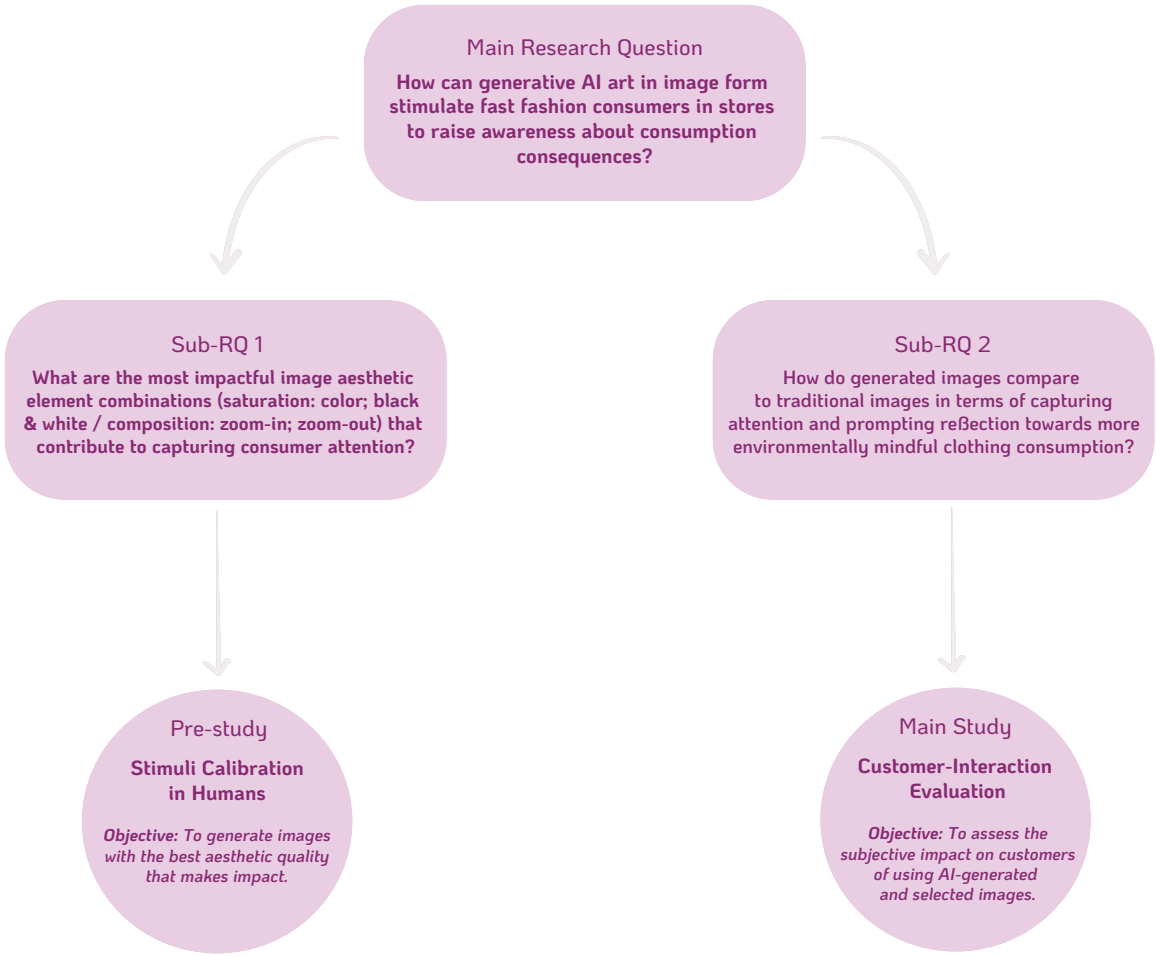



*Fig. 28. Overview of Experimental Studies*

Based on these questions, the hypotheses for each study to be tested were as follows:

| Pre-study | Main Study |
| --- | --- |
| **H1** Color images capture people's attention more than Black and White images. | **H1** Generative AI images capture people's attention more than traditional images. |
| **H2** Zoom-in images capture people's attention more than Zoom-out images. | **H2** Generative AI images induce more reflection than traditional images. |

To test these hypotheses, it was crucial to ensure consistency across both experiments. This begins with the design of the stimuli.

## 5.1.1 Designing the Stimuli

In order to conduct each experiment, some common elements needed to be designed beforehand to keep the consistency throughout the study. These consisted of selecting the type of prompt (input), the AI tool for generating the images (model), selecting the type of AI images to be presented (output) to the participants, and the evaluation form for participants to evaluate the images presented.

For the first three aspects (input, model, output), a comparison of different online AI tools was conducted. This helped to:

- **identify the platforms** that consist of models to iterate with,
- **identify the algorithms** used in each platform and what are the specific outputs,
- and **identify how the algorithm interprets the prompt** in a visual image form.

Large-scale diffusion algorithms were used: Stable Diffusion, DreamShaper, Imagen. Each of these algorithms comes with its own set of features and characteristics, catering to different needs and preferences from text-to-image synthesis (Reed, S. 2016; Frolov, S. et al., 2021; Sohn, K. 2024), image restoration and enhancement (Shao, L. et al., 2014; Fei, B. 2023; Yao, E. 2024), image compression (Li, X. 2020; Landu R S, 2022), to inpainting (Elharous, 2020; Bird, J. 2021). The differences among them also encompass Stable Diffusion as the most advanced open-source AI for image generation (Pernias et al., 2024; DeepGram, 2024), while the others are not open-sourced (Abdul, Q. et al., 2024).

Table 8 illustrates the input prompt, the AI online tools, and the output image for each different algorithm. Some online tools had more than one model within the platform.

### 1. Prompt selection process

The prompts selected for evaluation were diverse in nature, encompassing three distinct categories. The **first prompt involved a general exploration of the socio-environmental impact theme** pertaining to the future. The **second prompt presented a specific text** highlighting senses, emotions and the degradation of the theme, providing a focused stimulus for the AI tools. Lastly, the **third prompt centered around data extracted from a news article** (The Guardian, 2024), focusing on specific information about brands and the quantity of clothing produced.

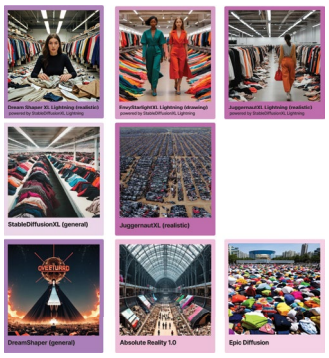
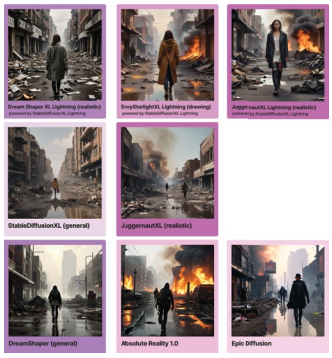
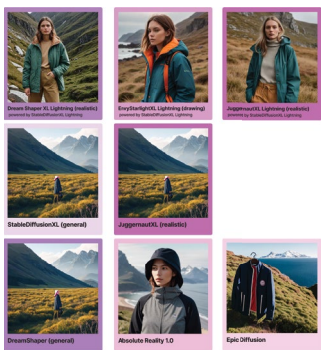
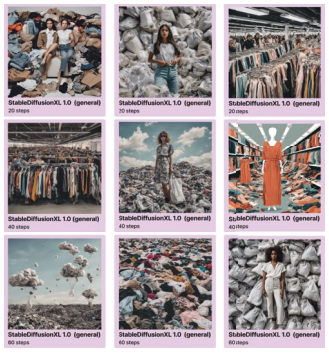
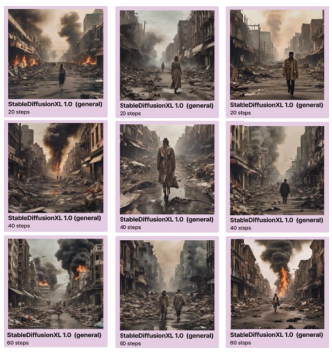
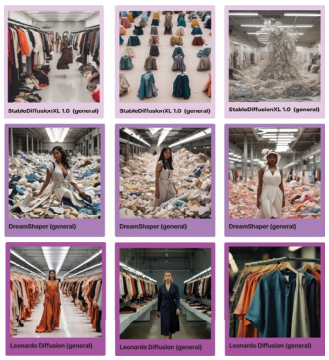
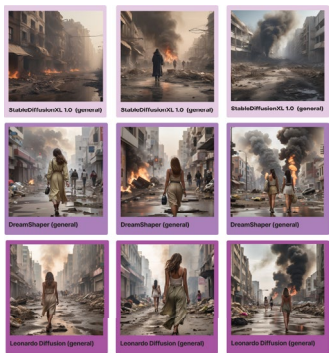
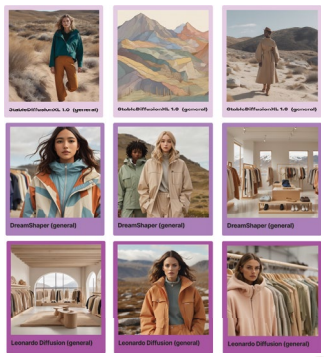
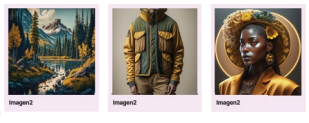
| | Prompt 1 | Prompt 2 | Prompt 3 |
|---|---|---|---|
| | "Future of the world impacted by overconsumption within fast fashion." | "Imagine yourself walking through a wasteland ravaged by the environmental consequences of fast fashion. You see streets flooded in clothing and the end of the street is burning, there is a disgusting smell, and you hear people scream in despair." | "American sustainable luxury brand Collina Strada produced 20,000 pieces of clothing in 2022, British outdoor brand Finisterre produced 450,643 pieces of clothing, and fellow British brand Lucy & Yak produced 760,951 pieces of clothing, resulting in huge environmental impact." |
| **DezGo**<br>Model(s): Dream Shaper, EnvyStarlight, Juggernaut, Stable Diffusion, Absolute Reality, Epic Diffusion |  |  |  |
| **Dream Studio**<br>by Stability.AI<br>Model(s): Stable Diffusion XL 1.0 |  |  |  |
| **Leonardo.ai**<br>Model(s): Stable Diffusion XL 1.0, Dream Shaper, Leonardo Diffusion |  |  |  |
| **Pollinations.ai**<br>Model(s): Stable Diffusion |  |  |  |
| **ImageFX Google**<br>Model(s): Imagen 2<br>*Used for generating visuals that are photorealistic* |  |  |  |

*Table 8. Comparison of AI tools with 3 prompts.*

## Prompt 1

"Future of the world impacted by overconsumption within fast fashion."

Key insight

*The images were closely aligned with the given prompt. All of them exhibited a sense of creative freedom, e.g., pollution impact depicted metaphorically as clouds; or as a wave of cloth pieces. Majority of the images had humans, clothing piles, elements of nature, showing the interconnectedness between human behavior, consumerism, and environmental impact. The images also showed foreground and background elements creating depth in the image's composition. An image featured text, although it was heavily scrambled, highlighting current limitations in generating images with grammatical coherence.*

## Prompt 2

"Imagine yourself walking through a wasteland ravaged by the environmental consequences of fast fashion. You see streets flooded in clothing and the end of the street is burning, there is a disgusting smell, and you hear people scream in despair."

Key insight

*The resulting image outputs from all of the AI tools exhibited a lot of similarity. Some outputs had humans and some only objects but all contained the city element. Some resonated photographic style and some 3-D style with figurative elements. The images generated by the Imagen2 algorithm stood out for their vibrant colors, capturing the intensity and urgency of the scene and conveying the gravity of the situation depicted in the prompt.*

## Prompt 3

"American sustainable luxury brand Collina Strada produced 20,000 pieces of clothing in 2022, British outdoor brand Finisterre produced 450,643 pieces of clothing, and fellow British brand Lucy & Yak produced 760,951 pieces of clothing, resulting in huge environmental impact".





Key insight

*The prompt and image result did not match. The AI model seems to have focused on aspects either from the brands mentioned or from the mentioning of American, British, sustainable brands, as the visuals portray landscapes, brown tones from nature, clear lightning, and clothing that bring sporty aspect. Also this prompt was the one that most generated images with "fashionable" people, varying from women to men.*

**Prompt 2** was chosen as the tool for all studies conducted, since it **demonstrated greater accuracy** according to specific criteria. Across the various platforms tested, **images generated for prompt 2 also showed a higher degree of consistency.** The prompts used for generating AI images in the study were structured with **detailed emotional language.**

Additionally, Prompt 1 can be incorporated to enhance creativity. However, prompt 3 was excluded due to significant limitations. For instance, attempts to include numerical impact data did not align with the generation of images. This would have been valuable for visually showcasing informational data on the impact of fashion. Unexpectedly, the generated artworks did not incorporate numerical elements into their visual aesthetics, indicating a limitation in the AI's ability to seamlessly integrate numerical information into the images.

Final decision of **prompt type** for experimental studies

## 2. Tool selection process

The DreamStudio tool was chosen for creating consistent and controlled visual stimuli for the study. Utilizing Stable Diffusion, it excels in generating unique and diverse outputs for each prompt. This was highlighted in the comparative analysis where it was the tool that produced a wider range of visually distinct images, visuals more closely connected to the input prompts, a variety of generated images on the same iteration for each prompt, and a balance of natural, urban, human, and object elements in its images. This diversity and creative approach highlighted DreamStudio's ability to generate unique outputs better fitted for this project.

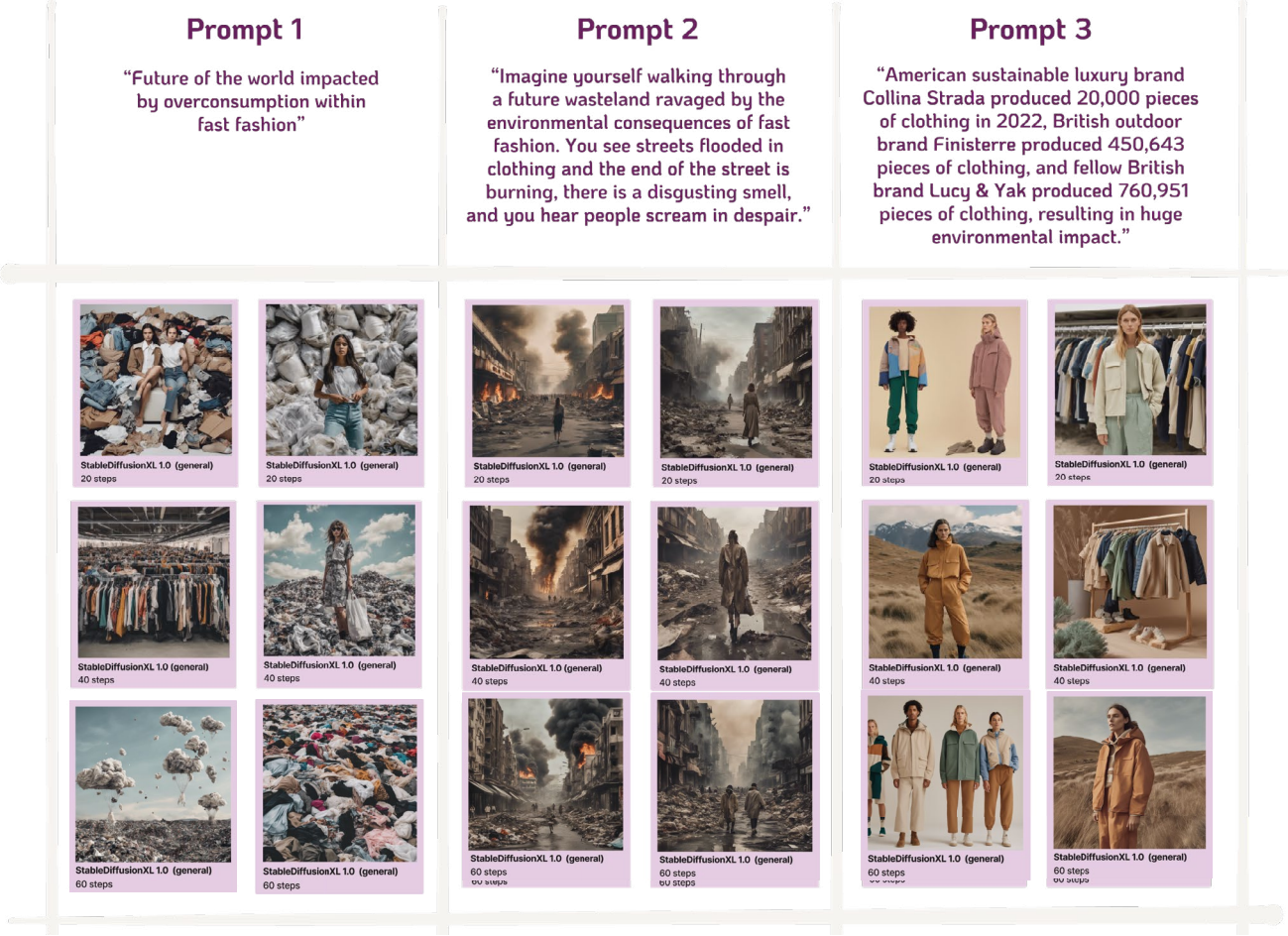



*Table 9. Image results for the 3 different prompts with tool Dream Studio by Stability.AI, using Model Stable Diffusion XL 1.0. For each prompt, 9 images in total were generated and each row represents the amount of steps (20, 40 and 60).*

The AI online tool **DreamStudio** was chosen to generate the AI images. In addition to the image coherence and diverse outputs, DreamStudio features an **easy-to-use interface and ensures that all images created are owned by the author**, allowing for commercial use.

Final decision of **tool selected** for experimental studies

## 3. Visual stimuli selection process

For selecting the type of images to be used in the experiments, specific requirements were delineated based on the comparative AI tools x image analysis (Table 8). Being aware that human participants would evaluate the AI-generated images, with the research context rooted in fashion, the concept intended for implementation within fashion stores, that the target clients being brands, and that the aspects to be addressed in the images would be related to socio-environmental impact, the **key factors in generating the images were**:

- **Human anatomy**
  Images should accurately depict human figures, ensuring the correct number of fingers, arms, and legs are present, consistent with real-life human anatomy.

- **Realistic composition**
  To avoid inducing higher construal levels that could distance participants from reality, images should be realistic rather than abstract or figurative. Apocalyptic themes were excluded to prevent further emotional distancing, ensuring images were consistent with real-life scenarios.

- **Fashion Editorial style**
  This style was preferred to enhance psychological engagement, especially since the project is directed towards fashion stores.

- **Imaginative aspect**
  A creative dimension should be incorporated into the visual stimuli to align with the study's focus on visual art.

- **Depicting a mix of elements**
  Images should reflect socio-environmental impact considerations by depicting a blend of elements such as people, environments, cities, and animals.

These criteria ensured that the selected images would effectively resonate with the target audience and meet the research objectives. For detailed correlations, see Section 2.3 of Chapter 2.

For the content elements within the images, the Theory of Construal Level (Trope & Liberman, 2003 - see Section 2.2.4; Chapter 2 for more details) was applied, favoring images that resonated with familiar associations. Table 1 illustrates the framework used to connect factual information with image content, focusing on the complexities of the fast fashion industry. This approach ensured that the images were both relevant and informative. For further details on how the AI-generated image content aligns with this framework, see the study design sections of Experiment 1 and 2.

Following the selection process, the evaluation of participants' perceptions of the visual stimuli is crucial. This phase assesses how effectively the chosen images engage participants and prompt reflection on the socio-environmental impacts of fast fashion. The subsequent section will delve into the methodologies and findings related to participant evaluations, providing insights into how the visual stimuli performed in eliciting desired responses.

## 4. Evaluation of participants perceptions on the visual stimuli

Since both studies involved images designed to capture attention and raise awareness, with the goal of inspiring action, the same criteria for participants to assess the images was used. The **evaluation criteria were based on the cognitive spheres encompassing subjective phenomena, including thoughts, feelings, sensations to act, and desires, which served as dependent variables**. For a detailed explanation of how these evaluation criteria were developed and applied, refer to Section 2.3 of Chapter 2.

Participants evaluated each image by answering the following six questions:
*(The order of Q1-Q6 below pertains to the order organized in the survey)*

Q1 **How does this image make you feel?** Emotion valence

Q2 **Does this image make you reflect on fast fashion?** Reflection towards product nature

Q3 **Does this image prompt you to be more mindful of your clothing consumption choice?** Reflection towards thought-provoking

Q4 **Does this image provoke you to change your habits?** Reflection towards action

Q5 **How much does this image capture your attention?** Arousal

Q6 **How does this image make you feel about buying fast fashion?** Action valence

Each question was associated with a 7-point Likert scale (1 - 7). Questions assessing valence (Q1 and Q6) measured how positive or negative participants perceived the stimulus, adapted from the Emotional Valence Questionnaire (Citron et al., 2016), with 0 indicating neutrality (Very Sad - Very Happy). Question 1 was based on Citron et al., (2016) but was adapted by the researcher to fit the answer rating Very Sad - Very Happy. Arousal (Q5), measured the degree of excitement or calmness evoked by the stimulus towards capturing participants attention Ganesh et al. (2010), so was set to use the scale Not at all - Very Much, by The Hedonic and Arousal Affect Scale (HAAS; Roca, P. et al. 2023). Together, valence and arousal tested if participants would do an action later in their lives from the impact of how the images affected them. Questions related to reflection were rated on a scale from Strongly Disagree to Strongly Agree (Pascal et al., 2002). This was intended to measure the degree to which a person experiences positive affect toward an advertisement because it evokes some memory of the person's past, in the case of this study evoking a memory for their routine, past behaviors. Lastly, questions regarding the importance of factors were rated from Not at all important to Extremely important, based on measuring how important a relationship is to a person and the desire to maintain it in the future.

The methods used to analyze these responses and interpret the data are detailed in the following section on data analysis.

## 5.1.2 Data Analysis

Both studies used statistical quantitative analysis via SPSS software. Different tests and post-hoc analyses were employed to scrutinize the data and derive findings. Refer to each study's data collection (Section 5.2.2 and Section 5.3.2) for specific methodologies.

To ensure coherent analysis and focused interpretation, participants' inputs were categorized into ***primary and complementary questions*** based on their importance to the study's objectives of assessing engagement, reflection, and potential behavioral changes. This links to insights presented in Chapter 2 from authors Valdez and Mehrabian, (1994); Pelowski et al., (2017).

**Primary questions assessed immediate engagement, depth of reflection prompted by the images, and potential behavioral changes.**

Q5 **How much does this image capture your attention?**
Focuses on the immediate impact and engagement level of the participants with the image.

Q2 **Does this image make you reflect on fast fashion?**
Measures the cognitive engagement of the participants and their depth of reflection on the topic.

Q4 **Does this image provoke you to change your habits?**
Complements Q2 by examining the potential for behavior change, important for understanding actionable impact.

**Complementary questions provided additional context by exploring emotional responses, mindfulness of consumption choices, and attitudes towards fast fashion purchases.**

Q3 **Does this image prompt you to be more mindful of your clothing consumption choice?** Complements Q2 by exploring mindfulness and thought processes of the participants.

Q1 **How does this image make you feel?**
Provides emotional context, helping to understand the affective response of the participants to the images.

Q6 **How does this image make you feel about buying fast fashion?**
Adds another dimension to emotional response, specifically related to the participants' purchasing behavior.

With a clear understanding of how participants interacted with the images, the next step was to conduct Experiment 1, which is detailed in the following section.

# 5.2 Experiment 1: Stimuli Calibration

## 5.2.1 Method

The **objective of the first experiment was to evaluate the aesthetic qualities of the images**, focusing on composition elements such as Zoom in (ZI) and Zoom out (ZO), as well as Saturation variations including Monochromatic (BW) and Chrome (C). This study aimed to explore how different aesthetic combinations impacted various persona types, identifying which qualities resonated more effectively with specific personas. Conducted as a within-subjects study, it was designed to maximize the influence of AI-generated images. The experiment process comprised three phases, as detailed below.

**Stimuli Preparation**

**STEP 1**
Generate combinations of the images aesthetic qualities.

**STEP 2**
Create images with each aesthetic combination in the selected AI tool.

**Data Collection**

**STEP 3**
Organize images in online survey to appear randomized to participants.

**STEP 4**
Each participant evaluates all of the 8 images (4 original and 4 replicates).

**Data Analysis**

**STEP 5**
Quantify result differences.

**STEP 6**
Select the combinations with most impact on the DVs.

**STEP 7**
Depending results, move to Experiment 2

When preparing the stimuli, the aesthetic qualities were combined as ZI*BW, ZI*C, ZO*BW, ZO*C, resulting in a 2x2 condition table for the images. However, considering participants might choose certain images due to specific elements within the image content, a (2x2)x2 condition table was defined (Table 10). This meant eight images were presented, with each aesthetic combination having a replicate to reduce bias in image selection related to content and to test the color and composition conditions effectively.

| | Original | | | | Replicates | | | |
|---|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |  |  |
| **Zoom-in** | ■ | | ■ | | ■ | | ■ | |
| **Zoom-out** | | ■ | | ■ | | ■ | | ■ |
| **Color** | | | ■ | ■ | | | ■ | ■ |
| **Black & white** | ■ | ■ | | | ■ | ■ | | |

*Table 10. Combination of aesthetic qualities per AI-generated artworks*

To connect the images to the supply chain framework discussed on page 55, Figure 29 illustrates the development of prompts for generating the images. This experiment incorporated all stages of the supply chain, and the images were crafted to balance elements of animals, humans, nature, and industry. Each image adhered to the established criteria for generation.

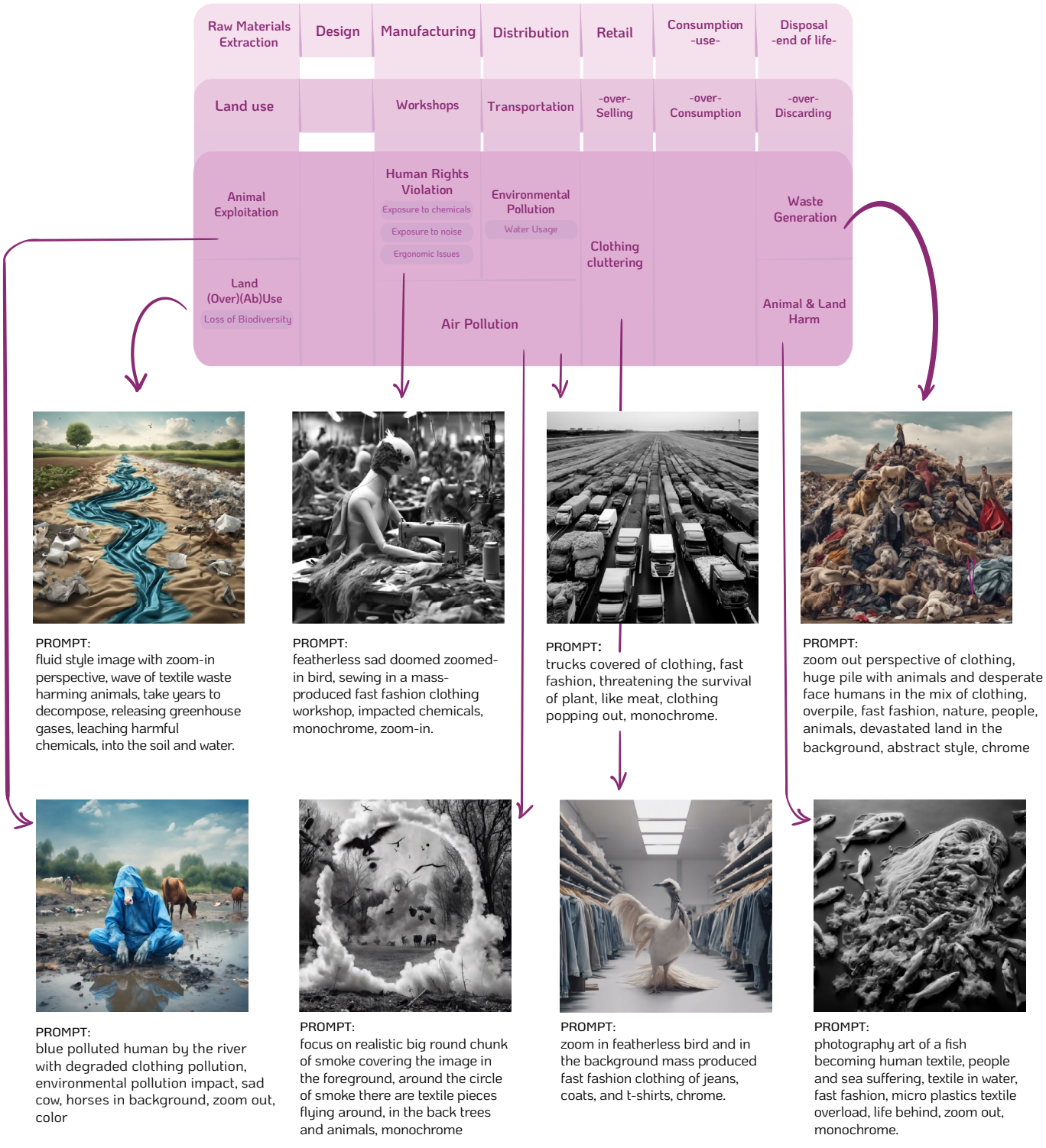



*Fig. 29. Overview of connections done from stimuli used in study with environmental consequences and prompts used for generating the images in AI tool DreamStudio.*

## 5.2.2 Data Collection

With the stimuli prepared and aligned with the supply chain framework, the next step involved collecting data to evaluate the effectiveness of these images in capturing attention and prompting reflection among participants.

### Participants

The study consisted of an online survey for distribution to participants that consume fast fashion clothing (n=111). The survey was open to people of different gender, ages, and nationalities, living in Europe. The majority of the participants that took part were from The Netherlands (82%), with other countries also present being France, Germany, Portugal, UK, Finland, Spain, Switzerland, Cyprus, Poland, and Italy. The highest amount of participants ranged from 24 to 27 years old (57%) and 46.9% were male with 50.5% female. The tool used to develop the study was Qualtrics. The survey was shared with participants' networks and on online forums for survey exchange, enabling a varied sample.

### Procedure

The survey contained three sections: Shopping Behavior, Artificial images impact, and Demographics and took approximately 10 minutes for the participant to complete. Prior to beginning the survey, participants were required to provide informed consent, indicating their voluntary agreement to participate after fully understanding the nature and implications of the study. In the Shopping Behavior stage, participants were introduced to descriptions of three personas developed for the research and asked to select the one they identified with most closely. Then, they were asked to answer questions about their shopping behavior, including reasons and decisions for buying clothes and the importance they placed on a brand's environmental and ethical practices in their purchase decisions. The order of the Persona and Shopping Habits answer options were mixed to help prevent response bias. In the Artificial Images Impact section, participants evaluated 8 images, each presented at a time in a randomized order to ensure the validity and reliability of the findings. Each image was accompanied by 6 evaluation questions. To conclude the survey, participants provided their gender, age, and country of residence. They also had the option to provide their email address if they were interested in receiving the study's results.

Refer to Appendix D to view the survey structure designed in Qualtrics.

### Measures

**Independent Variables (IV)**

- Images aesthetics
- Compound of composition (zoom in vs. zoom out) and saturation (color vs. black and white)
- Persona identification

**Dependent Variables (DV)**

Ratings on the six questions:

- Arousal
- Reflection on fast fashion
- Reflection on participants' own actions
- Thought-provoking reflection;
- Valence (emotional tone)
- Shopping behavior

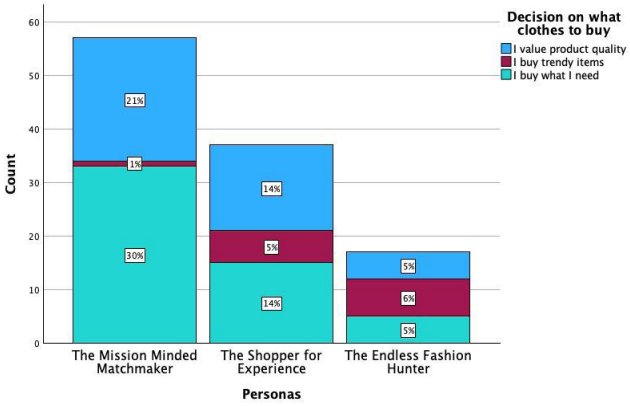
**Control Variables (CV)**

- Random assignment of artworks to participants
- Survey structure (Qualtrics design for randomization)

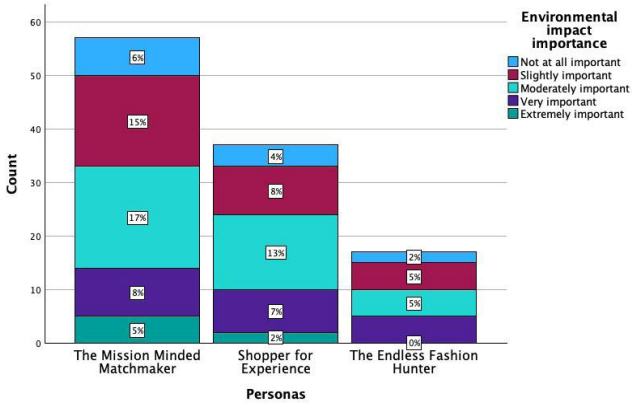
## 5.2.3 Analysis and Main Results

For this within-subjects experiment, each of the six evaluation questions underwent two sets of analyses for the aesthetics of the images and a persona analysis, with crosstabs examination on the amount of each persona selecting different elements in specific questions. E.g., how many of the persona MMM's selected "I only buy what I need".

### Persona



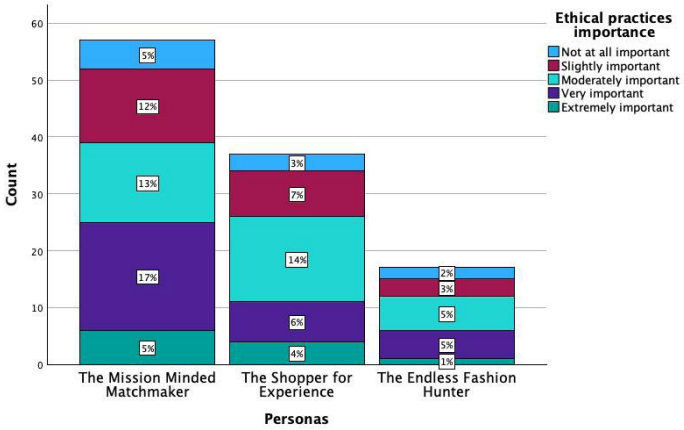

*Graph A. Decision on what items to buy*




*Graph B. Environmental importance when shopping*

The graph shows there is a **tendency where the more the "need" increases, the more the "trendy" reduces and vice versa**. This means that trend has some degree of opposition with need. Every consumer seems to value product quality.

Graph B illustrates that the **importance of the environment remains consistent, with changes occurring primarily in consumption style**. This indicates that EFHs stop to reflect, there is the potential to consider environmental impact more deeply when making purchasing decisions.




*Graph C. Ethical considerations when shopping*

Comparing the two graphs, **the ethical issue can influence the mission-minded**. Comparing Graph C with other data, environment and ethics have the power to influence. For each profile, one of these factors can have more influence. This can be used for study 2 in the choice of images because the content included more environment than ethics.

## 1x8 Image Analysis

Descriptive statistics provided an overview by independently analyzing each of the eight artworks per question. The Shapiro-Wilk test was used for checking normality, and Friedman's test was applied for correction, revealing statistically significant differences in scores across the eight artworks.

Across all six questions, the median scores ranged from 3 to 4.5, indicating balanced responses (Table 11). The artworks were highly effective in influencing habit change (median score of 4.5), moderately impacted attention and reflection, and elicited balanced emotional and attitudinal responses. With Question 4 at 4.5, participants slightly agreed more with changing their habits, showing higher effectiveness compared to other questions. Questions 5 and 3 had a median of 4, indicating the artworks were somewhat effective in grabbing attention and stimulating deep reflection.

| Variables | Likert scale (1 - 7) | Median |
|---|---|---|
| Q5 Grabs attention | Not at all - Totally | 4 |
| Q2 Prompts fast fashion reflection | Strongly Disagree - Strongly Agree | 3.5 |
| Q4 Provokes habit change | | 4.5 |
| Q3 Prompts mindful consumption | | 4 |
| Q1 Emotional engagement | Very Sad - Very Happy | 3 |
| Q6 Feeling on buying fast fashion | Very Negative - Very Positive | 3.5 |

*Table 11. Median Scores for the six questions.*

## Testing for Normality and Assumption Testing

The Shapiro-Wilk test indicated that none of the six questions across the eight artworks were normally distributed ($p < 0.001$). The Friedman test was then employed, resulting in significant differences across conditions for each question, indicating that the distributions of scores were not the same across conditions, with at least one condition differing significantly from the others.

- Q5: $X^2(7) = 42.728$, $p < .001$
- Q3: $X^2(7) = 246.329$, $p < .001$
- Q2: $X^2(7) = 255.835$, $p < .001$
- Q1: $X^2(7) = 218.314$, $p < .001$
- Q4: $X^2(7) = 177.108$, $p < .001$
- Q6: $X^2(7) = 190.882$, $p < .001$

For ANOVA repeated measures, Mauchly's Test of Sphericity indicated violations for four questions (Q5, Q2, Q3, and Q6) with $p < 0.05$. Greenhouse-Geisser corrections were applied, resulting in:

- Q5: $F(6.124, 673.661) = 2.256$, $p = 0.035$
- Q3: $F(6.072, 667.880) = 46.742$, $p < 0.001$
- Q2: $F(6.051, 665.656) = 46.978$, $p < 0.001$
- Q6: $F(6.091, 670.003) = 30.157$, $p < 0.001$

| Variables | Mauchly's W | Approx Chi-Square | df | Sig. | Epsilon b | | |
|---|---|---|---|---|---|---|---|
| | | | | | Greenhouse-Geiser | Hyunh-Feldt | Lower-bound |
| Q5 Grabs attention | .592 | 56.296 | 27 | <.001 | .875 | .932 | .143 |
| Q2 Prompts fast fashion reflection | .600 | 54.930 | 27 | .001 | .864 | .520 | .143 |
| Q4 Provokes habit change | .700 | 38.250 | 27 | .074 | .912 | .975 | .143 |
| Q3 Prompts mindful consumption | .590 | 56.677 | 27 | <.001 | .867 | .924 | .143 |
| Q1 Emotional engagement | .786 | 25.890 | 27 | 0.525 | .934 | .999 | .143 |
| Q6 Feeling on buying fast fashion | .576 | 59.310 | 27 | <.001 | .870 | .927 | .143 |

*Table 12. Mauchly's Test of Sphericity results for the six questions*

These results indicate significant differences in each of the questions among the levels of composition and saturation, **allowing us to reject the null hypothesis**.

## 2x2x2 Image Analysis

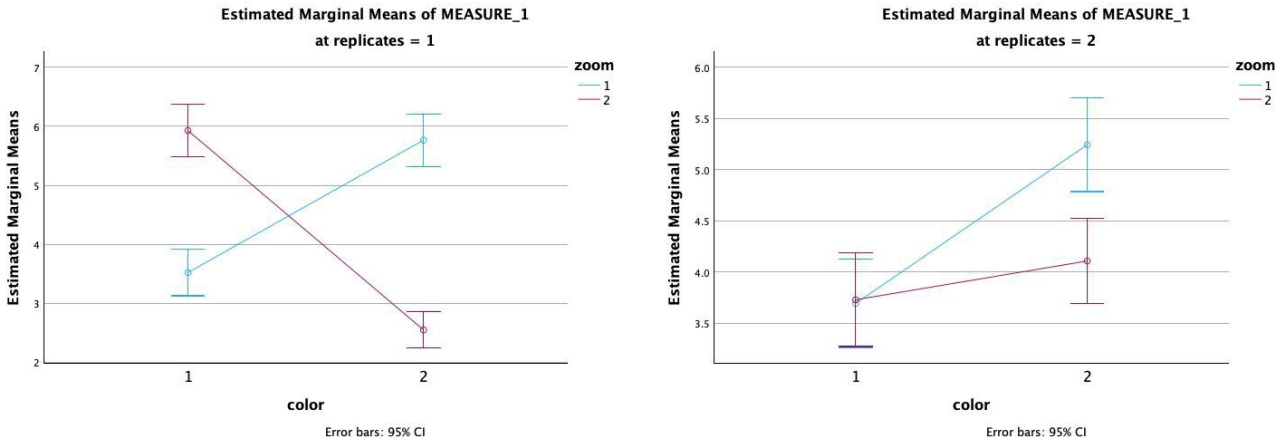
Given the 1x8 significant differences, a 2x2x2 analysis using repeated measures ANOVA was conducted. This analysis examined the combinations of aesthetic factors (color, zoom, and replicates) per question across the images. Mauchly's Test of Sphericity validated assumptions, and if violated, the Greenhouse-Geisser correction was applied to the F-tests. Interaction effects were explored using the 2x2x2 Test of Within-Subjects Effects, revealing individual and combined effects of the different levels in the study. Interaction plots and post hoc Pairwise Comparisons further detailed these effects. From this image analysis, a diagnosis was made, leading to the second experiment.

All of the six questions demonstrated a statistically significant interaction effect between the conditions, with **Q2 and Q4 showing particularly pronounced interactions involving zoom*color and zoom*color*replicates**, as detailed in Table 13.

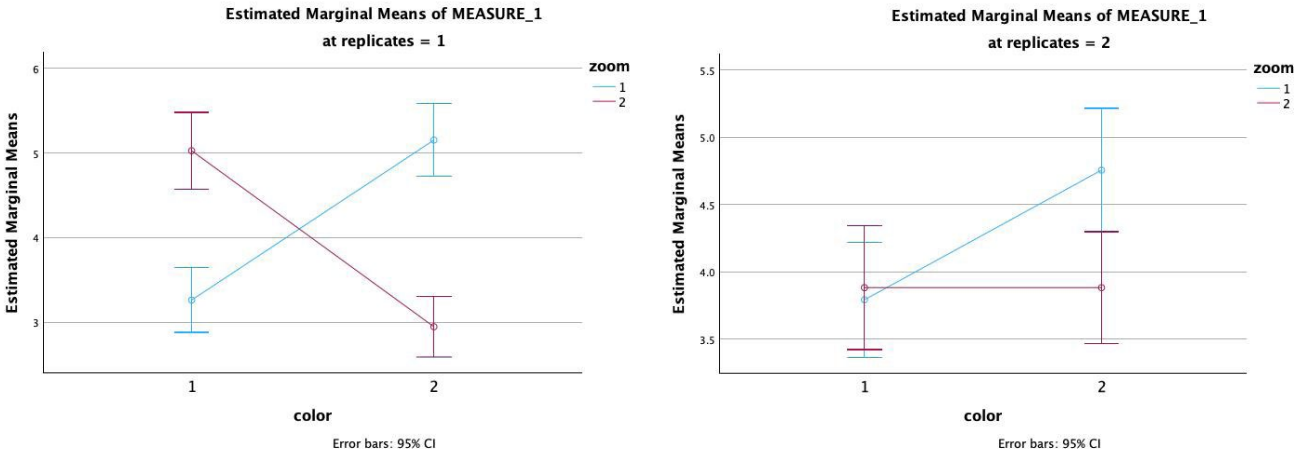
| Variables | Independent Effects | Interaction Effects | | |
|---|---|---|---|---|
| | Saturation (color vs. black and white) | Zoom x Color | Zoom x Replicates | Zoom x Color x Replicates |
| Q5 Grabs attention | No statistically significant effect<br><br>F(1, 110) = 0.590, p = 0.444. | Statistically significant effect*<br><br>F(1, 110) = 7.882, p = 0.006. | Statistically significant interaction effect*<br><br>F(1, 110) = 3.920, p = 0.050. | No statistically significant interaction effect<br><br>F(1, 110) = 0.034, p = 0.853. |
| Q2 Prompts fast fashion reflection | Statistically significant effect*<br><br>(F(1,110) = 19.838, p < .001). | Highly significant interaction effect*<br><br>(F(1,110) = 170.301, p < .001). | Statistically significant interaction effect*<br><br>(F(1,110) = 41.023, p < .001). | Highly significant interaction effect*<br><br>(F(1,110) = 74.286, p < .001). |
| Q4 Provokes habit change | Statistically significant effect<br><br>(F(1, 110) = 10.562, p = .002). | Highly significant interaction effect<br><br>(F(1, 110) = 119.779, p < .001). | Statistically significant interaction effect<br><br>(F(1, 110) = 7.636, p = .007). | Highly significant interaction effect<br><br>(F(1, 110) = 43.507, p < .001). |

*as p < 0.05

*Table 13. Most statistically significant independent and interaction effects results for the primary questions*




*Graphs D. Interaction plots on how the art makes participants reflect on fast fashion (Q2)*




*Graphs E. Interaction plots on how the art provokes participants to change habits question (Q4)*

| Variables | Zoom | Color | Replicates | Mean | Std. Error | Lower-bound | Upper bound |
|---|---|---|---|---|---|---|---|
| Q2 Prompts fast fashion reflection | zoom-in | color | Zoom-in x color 1 | 3.523 | .199 | 3.128 | 3.917 |
| | | | Zoom-in x color 2 | 3.694 | .219 | 3.259 | 4.128 |
| | | black & white | Zoom-in x b&w 1 | 5.766 | .225 | 5.321 | 6.211 |
| | | | Zoom-in x b&w 2 | 5.243 | .231 | 4.786 | 5.701 |
| | zoom-out | color | Zoom-out x color 1 | 5.928 | .226 | 5.481 | 6.375 |
| | | | Zoom-out x color 2 | 3.730 | .230 | 3.273 | 4.186 |
| | | black & white | Zoom-out x b&w 1 | 2.550 | .154 | 2.244 | 2.855 |
| | | | Zoom-out x b&w 2 | 4.108 | .211 | 3.690 | 4.526 |
| Q4 Provokes habit change | zoom-in | color | Zoom-in x color 1 | 3.261 | .192 | 2.880 | 3.642 |
| | | | Zoom-in x color 2 | 3.793 | .216 | 3.364 | 4.222 |
| | | black & white | Zoom-in x b&w 1 | 5.153 | .217 | 4.723 | 5.583 |
| | | | Zoom-in x b&w 2 | 4.757 | .232 | 4.298 | 5.216 |
| | zoom-out | color | Zoom-out x color 1 | 5.027 | .228 | 4.574 | 5.480 |
| | | | Zoom-out x color 2 | 3.883 | .232 | 3.424 | 4.342 |
| | | black & white | Zoom-out x b&w 1 | 2.946 | .181 | 2.587 | 3.304 |
| | | | Zoom-out x b&w 2 | 3.883 | .210 | 3.467 | 4.299 |

*Table 14. Pairwise Comparisons for Question 2 and 4*

The interaction plots and post hoc pairwise comparisons revealed that the combination of zoom-in and monochrome was the most statistically significant in maximizing impact across all six questions. Graph E (Question 2) shows that Zoom In with black and white images enhanced the effectiveness of prompting habit changes, while Zoom Out initially had a stronger effect with color images but diminished with black and white. In replicate 2, both zoom in and out were effective, with Zoom In performing well in black and white and Zoom Out maintaining effectiveness in both color and black and white images. Graph F (Question 4) indicated similar results: **Zoom In with black and white images was most effective**, and Zoom Out initially worked better with color images but was less effective with black and white. In replicate 2, Zoom In remained effective with black and white, and Zoom Out was effective across both saturations. Overall, the results consistently showed that the combination of zoom in and monochrome had the most significant impact across all six questions analyzed from participants' responses.

The results from Experiment 1 yielded two major insights:

**Influence of Environmental vs. Ethical Considerations:**
The analysis revealed that environmental and ethical considerations significantly influence consumer behavior. For Study 2, this insight suggests prioritizing environmental content in the images rather than focusing on ethical aspects. This recommendation is particularly relevant given that the target audience for Study 2 consists of Endless Fashion Hunters, who are likely to be more responsive to environmental messaging.

**Effectiveness of Zoom-In and Monochrome Combination:**
The second major insight from Experiment 1 was the observed effectiveness of the zoom-in and monochrome combination in maximizing impact across all six evaluation questions. This finding supports the decision to utilize this specific visual strategy exclusively in Study 2, ensuring a focused and impactful approach in image design.

**Major takeaway** from Pre-Study

This next section delves into how these results informed the design and execution of the subsequent experiment, focusing on further refining and validating the visual strategies to influence consumer awareness in fast fashion stores.

# 5.3 Experiment 2: Exploring Consumer Choices

## 5.3.1 Method

This following study was designed as **between-groups**, with the **main objective being to evaluate whether individuals perceived a greater impact from standard fast fashion advertising or from the AI-based visual art intervention**, designed in this project (detailed in Chapter 4). Therefore a control and treatment study was designed. Details to each phase are presented below.

**Stimuli Preparation**

**STEP 1**
Define prompts on critical aspects of sustainability.

**STEP 2**
Generate one image for each prompt.

**Data Collection**

**STEP 3**
Participant chooses prompt that they most desire an answer to.

**STEP 4**
Deliver corresponding image to participant.

**STEP 5**
Participant evaluates images.

**Data Analysis**

**STEP 6**
Evaluate if control or treatment group had the most differences and check if any specific effect is statistically significant.

All visual stimuli in this study adhered to consistent conditions to ensure research uniformity, as shown in Figures 30 and 31. The text and brand position are the same as well as the content of the text. Fig. 30 also demonstrates how the theories were transformed into information for creating the text.

**Aesthetic quality combination:** Zoom in * Black and white, based on prominent results from Experiment 1
**Layout:** included both image and text
**Image content:** elements relevant to the fast fashion industry
**Text content:** Socio-environmental information, using theories selected as design criteria for the visual aspect in the designed concept (Section 4.3.1, Chapter 4)


*Fig. 30. Style design for every group in the study. Left image shows theories used for creating the message and image on the right represents the translation into the text.*

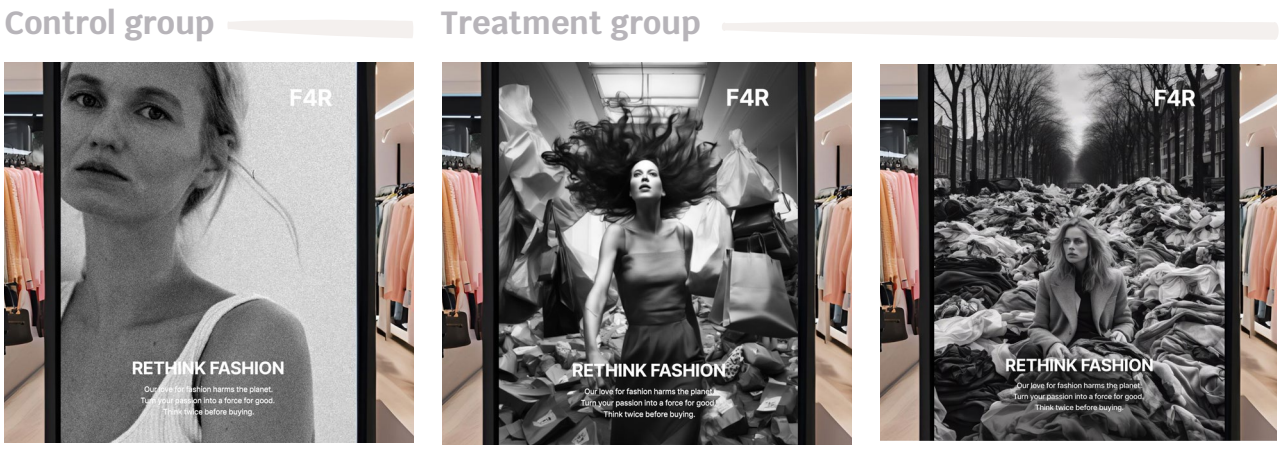



*Fig. 31. Visual Stimuli Design for Experiment 2: Final mockups used in the study, for control and treatment groups.*

## Control group

From adhering to the criteria for the visual stimuli and to the experiment's context, a desk research was conducted for selecting the image. Fast fashion brands were searched targeting "sustainable", "eco", "conscious" ad campaigns that they executed over the past years. Since the study involves fast fashion brands, this decision was made to ensure contextual consistency to reality. Knowing that fast fashion brands do not tend to dedicate themselves towards eco collections, it was interesting to see that around four brands had. These included Levi's, H&M, Nike and Primark (Fig. 32) and from these one was chosen to be replicated specifically for the study, adhering to criteria for keeping conditions in the experiment controlled.

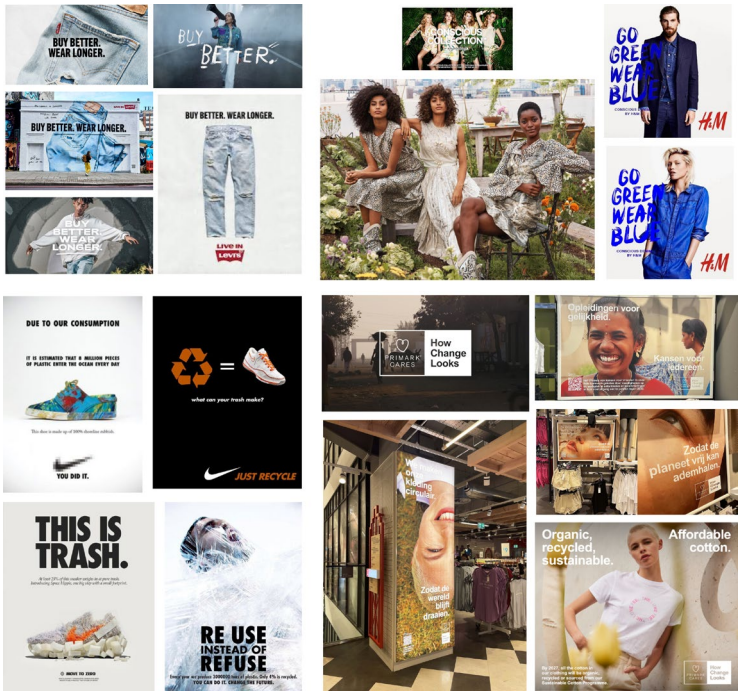



*Fig. 32. Ad campaigns from fast fashion brands used as inspiration for control group visual stimulus design. Top-left: Levis; top-right: H&M; bottom-left: Nike; bottom-right: Primark.*

## Treatment Group: question and visual stimuli process

The designed concept, demonstrated in detail in Chapter 4 was incorporated into the treatment group. Questions were formulated based on Fig. 4 - vicious cycle of overproduction and overconsumption, specifically, the questions focused on “outfit of the year” and “future fashion trends,” aligning with the EFH preferences (System 1). These questions were selected for their relevance to understanding different stages of the vicious cycle, presented in Figures 33 and 34.

As depicted in Fig. 33, the questions highlighted in orange were chosen for the experiment to simulate the consumer experience, as they aimed to provide tips to consumers, resonating with their interests. Other questions were excluded to mitigate selection bias during the study, where participants were initially presented with four options but evaluated only one. The design concept was crafted to offer consumers a meaningful choice, leading to the decision to streamline options to just two as the optimal outcome.

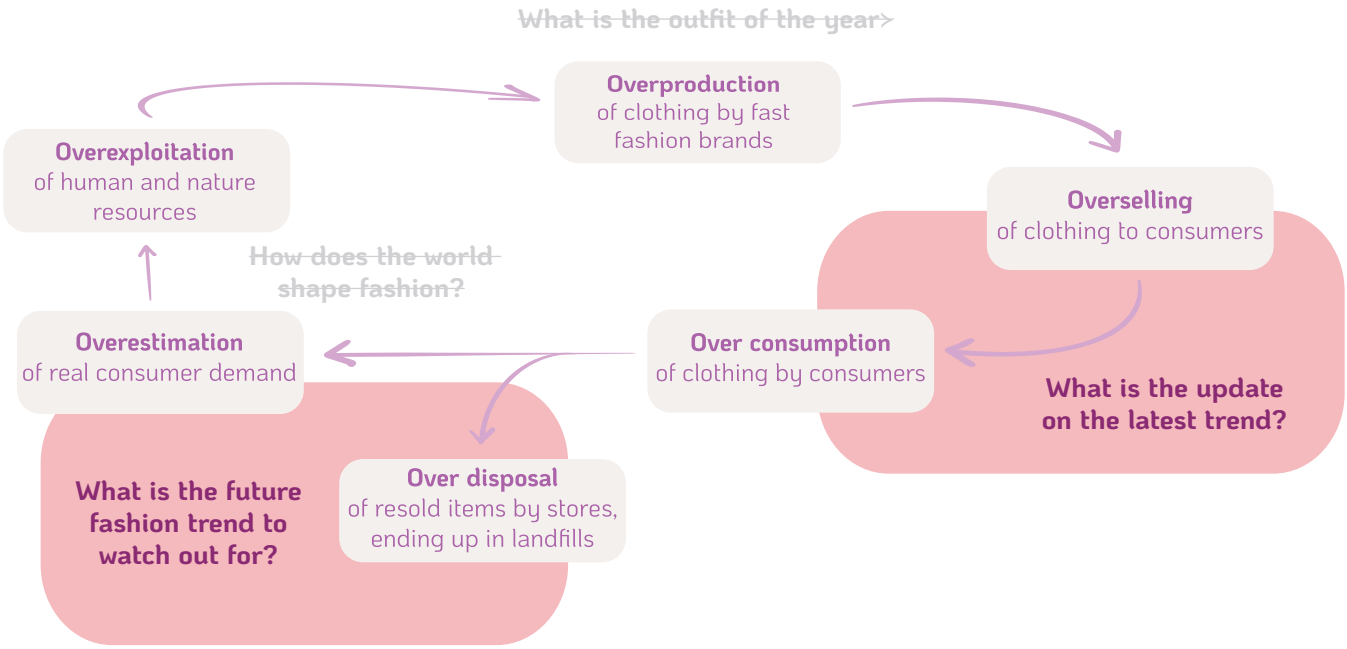



*Fig. 33. Questions used as prompts for generating images*

The questions served as prompts for developing images in the experiment, strategically designed to illustrate connections with the supply chain and socio-environmental consequences, as shown in Figure 34. All the images directly stemmed from the question prompts selected for executing the study and the fully visible ones were used in the study.

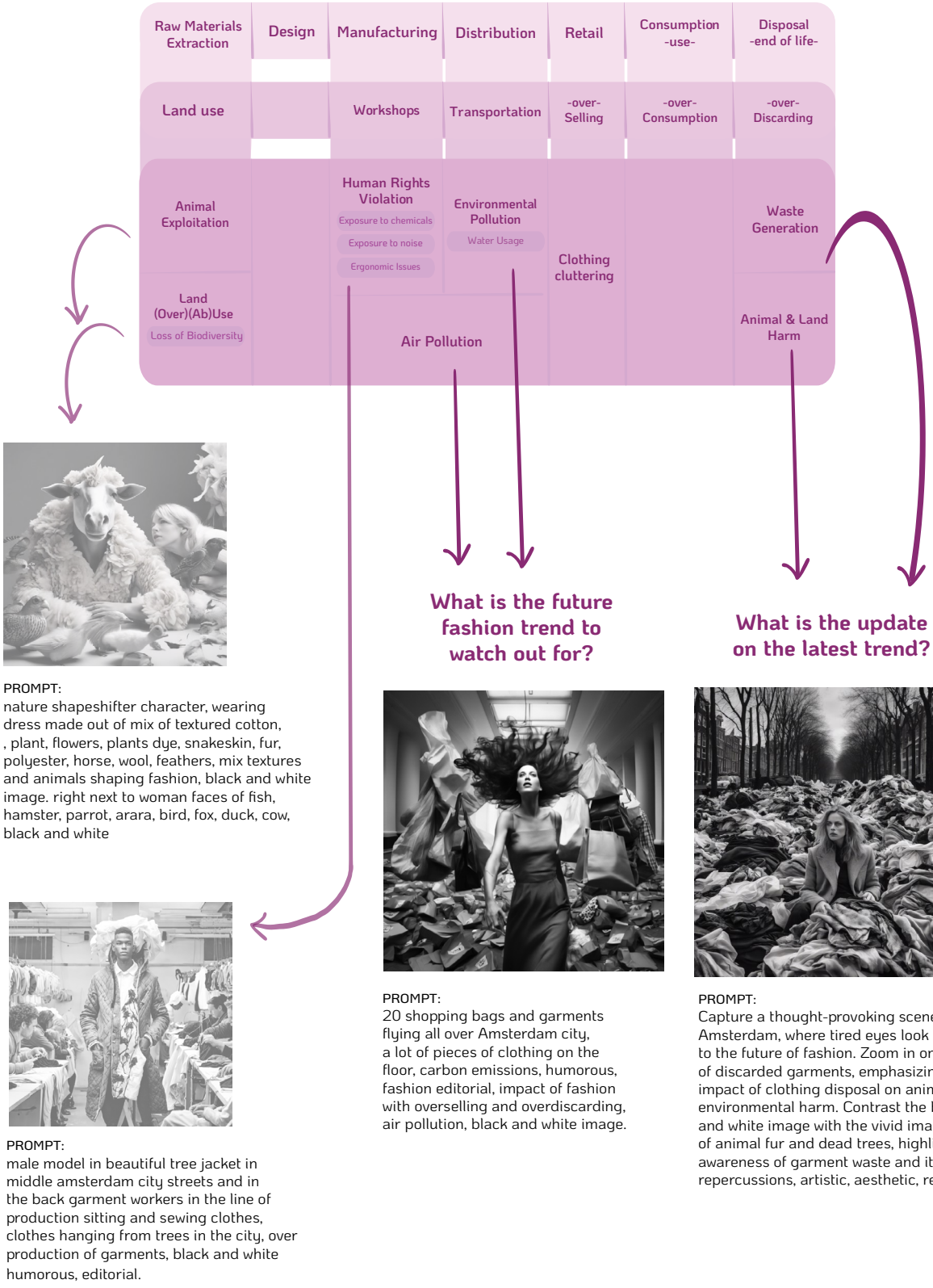



*Fig. 34. Interconnection of supply chain framework and images designed for study.*

With the preparation of the visual stimuli complete, the next step involved structuring the survey and gathering data to evaluate the effectiveness of the designed concept. The following section details the data collection process, including participant recruitment, survey distribution, and methods for ensuring reliable and valid responses.

## 5.3.2 Data Collection

### Participants

In the study, 254 participants took part in the online survey. Geographic distribution comprised 65% of the participants residing in The Netherlands, making it the country with the highest representation in the survey. 9% of the respondents were from the UK, the second-largest group, and 7% of the participants were from Portugal. The remaining 19% of participants were spread across various European countries, including: France, Germany, Spain, Turkey, Switzerland, Italy, Czech Republic, Finland, Denmark, and Belgium. In terms of gender distribution, the majority of participants were female, accounting for 59% of the total respondents and 38% of the participants were male. In terms of age range, participants varied from 18 to 70 years old, with the majority (55%) having between 24 to 29 years old.

The recruitment followed sharing the survey to researchers' network and on online forums for survey exchange, enabling a varied sample. To ensure the study targeted Endless Fashion Hunters and Shoppers for Experience consumers of fast fashion, participants were asked to select the persona they most resonated with. Overall, 47% of the participants identified as either EFH or S4E, with 51 participants (21%) being EFH and 63 participants (25%) being S4E. The remaining 53% identified as Mission Minded Matchmakers (MMM). The participants were randomly divided into control and treatment groups, ensuring that each participant had an equal chance of being assigned to either group, balancing out potential confounding variables that could influence the outcome of the study. This approach was chosen to reduce selection bias and increase the likelihood that any differences observed between the groups can be attributed to the intervention rather than pre-existing differences between participants. The survey was designed using the Qualtrics tool, which facilitated the use of specific commands to structure the survey flow, including randomization and branching techniques. This allowed for the assignment of participants to different parts of the survey, ensuring a methodologically sound approach.

### Procedure

The survey consisted of three sections: Control/Treatment Groups, persona identification and demographics. At the start all participants were asked to provide informed consent, indicating their voluntary agreement to participate in the study and everyone received a general scenario situating them in the context of going shopping for clothes. From there, each participant was randomly assigned in an even ratio to control or treatment groups. The control group section of the survey consisted of receiving a traditional advertising image. The treatment section received the image of a screen containing two questions as the first part of the intervention and then the participants could select one of the questions. If they chose question 1, they would receive an AI-generated image and if they chose question 2, they would get another image. For all images, control, treatment 1 or treatment 2, after viewing the specific images, participants had to rate them based on the images six questions for image evaluation. Based on arousal, reflection, and reflection to take action, reflection as thought provoking and valence, one of the reflection questions was modified from "reflecting on fast fashion" to be specific "reflecting on their own action", taking in consideration that participants receive a contextual scenario at this study. Then, they were asked to identify with one of the personas developed for the study and gender, age and country of residence. In total, the survey took approximately 5 minutes to complete. Refer to Appendix E for the interview guide.

## Measures

**Independent Variables (IV)**

- Images aesthetics
- Compound of composition (zoom in vs. zoom out) and saturation (color vs. black and white)
- Persona identification

**Dependent Variables (DV)**

Ratings on the six questions:

- Arousal
- Reflection on fast fashion
- Reflection on participants' own actions
- Thought-provoking reflection;
- Valence (emotional tone)
- Shopping behavior

**Control Variables (CV)**

- Random assignment of participants to control and treatment groups
- Survey structure (Qualtrics design for randomization)

# 5.3.3 Analysis and Main Results

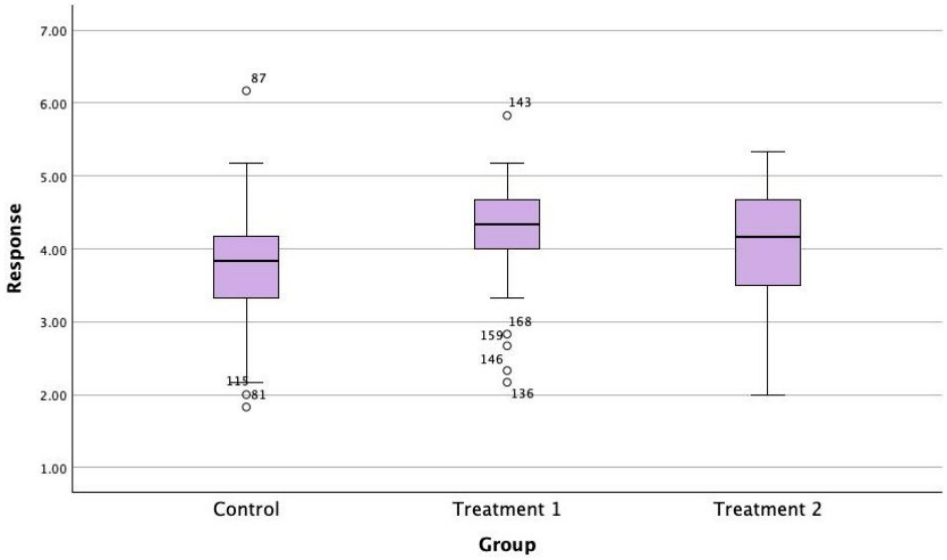
In this between-groups design study, mean ranks for each group were calculated and are presented in Table 15. This table provides an overview of the central tendencies across the groups, offering insight into the distribution of responses.

## Descriptive Statistics

| | N | Mean | Std. Deviation | Std. Error | 95% Confidence Interval for Mean | | Min. | Max. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Lower-bound | Upper-bound | | |
| Control group | 122 | 3.7296 | .73789 | .06681 | 3.5973 | 3.8618 | 1.83 | 6.17 |
| Treatment group 1 | 71 | 4.2511 | .67760 | .08042 | 4.0907 | 4.4115 | 2.17 | 5.83 |
| Treatment group 2 | 61 | 4.0030 | .82669 | .10585 | 3.7912 | 4.2147 | 2.00 | 5.33 |
| Total | 254 | 3.9410 | .77394 | .04856 | 3.8454 | 4.0367 | 1.83 | 6.17 |

*Table I5. Descriptive Statistics across the three groups.*

Across all groups, **Treatment 1 showed the most significant differences in means**. The image is most effective in prompting participants to be more mindful of their clothing consumption choices (Q3), followed closely by its ability to make participants reflect on fast fashion (Q2). It captures attention well (Q5), which is important, but its effectiveness in changing habits (Q4) is relatively lower.




*Graph F. Boxplot showing central tendency across control and treatment groups.*

This box plot demonstrated that T1 had the highest median among the groups, followed by T2 and control with the lowest. It can be suggested that, on average, participants in T1 responded had higher scores compared to those in T2 and the Control group. Furthermore, T2 showed that there was a greater variability in responses with T1 being the most less variable with smallest whiskers to both sides suggesting that responses are more consistent. Although T1 had the least variability overall, the presence of the most outliers suggests that while most responses are clustered around the median, there are some extreme values that are substantially different from the majority of scores.

## Testing for Normality across Responses

Following this, data normality was assessed using skewness and kurtosis values. Most variables showed deviations from normality, with Control on feeling towards buying fast fashion (Q6) and T2 on general emotional engagement to the AI art (Q1) demonstrating values closest to a normal distribution, though not significantly different from other variables. Histograms were also examined for each variable to visually confirm these findings. Due to the volume of data, these histograms are available in ***Appendix F***.

Given the non-normal distribution of the data, the Kruskal-Wallis test, a non-parametric method, was used to assess significant differences among the groups. As shown below, The results indicated statistically significant differences ($p < 0.001$), allowing to reject the null hypothesis that the observed results are due to chance. This suggests significant variation in how participants perceived within the different groups perceived art in grabbing attention, prompting reflection on fast fashion, provoking to change habits, emotional engagement with art, prompting mindful consumption, and the impact of art on feelings about buying fast fashion.

*Grabbing Attention*

Q5: $X^2(2)=41.520$, $p<0.001$

*Emotional Engagement*

Q1: $X^2(2)=39.256$, $p<0.001$

*Reflection on Fast Fashion*

Q2: $X^2(2)=24.788$, $p<0.001$

*Prompting Mindful Consumption*

Q3: $X^2(2)= 31.274$, $p<0.001$

*Provoking Change in Habits*

Q4: $X^2(2) = 17.691$, $p<0.001$

*Feeling on buying fast fashion*

Q6: $X^2(2) = 22.422$, $p<0.001$

## Pairwise Comparisons

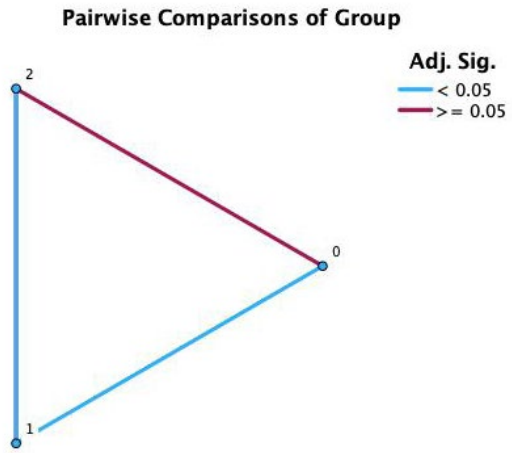
Post hoc pairwise comparisons were subsequently conducted using the Mann-Whitney U test with Bonferroni corrections to control for multiple comparisons.

| | Comparison | Test Statistic | Std. Error | Std. Test Statistic | Sig. (Un-adjusted) | Adj. Sig. (Bonferroni) |
|---|---|---|---|---|---|---|
| Q5 Grabs attention | Control vs. T1 | -68.884 | 10.695 | -6.441 | <0.001 | 0.000 |
| | Control vs. T2 | -23.668 | 11.462 | -2.065 | 0.039 | 0.117 |
| | T1 vs. T2 | 45.216 | 12.654 | 3.573 | <0.001 | 0.001 |
| Q2 Prompts fast fashion reflection | Control vs. T1 | -59.049 | 10.568 | -5.588 | <0.001 | 0.000 |
| | Control vs. T2 | -19.710 | 11.325 | -1.740 | 0.082 | 0.245 |
| | T1 vs. T2 | 39.339 | 12.503 | 3.146 | 0.002 | 0.005 |
| Q4 Provokes habit change | Control vs. T1 | -44.140 | 10.685 | -4.131 | <0.001 | 0.000 |
| | Control vs. T2 | -25.013 | 11.451 | -2.184 | 0.029 | 0.087 |
| | T1 vs. T2 | 19.127 | 12.642 | 1.513 | 0.130 | 0.391 |
| Q3 Prompts mindful consumption | Control vs. T1 | 48.138 | 10.466 | 4.600 | <0.001 | 0.000 |
| | Control vs. T2 | 6.198 | 11.216 | 0.553 | 0.581 | 1.000 |
| | T1 vs. T2 | -41.939 | 12.382 | -3.387 | <0.001 | 0.002 |
| Q1 Emotional engagement | Control vs. T1 | 57.460 | 10.496 | 5.474 | <0.001 | 0.000 |
| | Control vs. T2 | -68.072 | 12.418 | -5.482 | <0.001 | 0.000 |
| | T1 vs. T2 | -10.612 | 11.249 | -0.934 | 0.345 | 1.000 |
| Q6 Feeling on buying fast fashion | Control vs. T1 | 48.138 | 10.466 | 4.600 | <0.001 | 0.000 |
| | Control vs. T2 | 6.198 | 11.216 | 0.553 | 0.581 | 1.000 |
| | T1 vs. T2 | -68.884 | 10.695 | -6.441 | <0.001 | 0.002 |

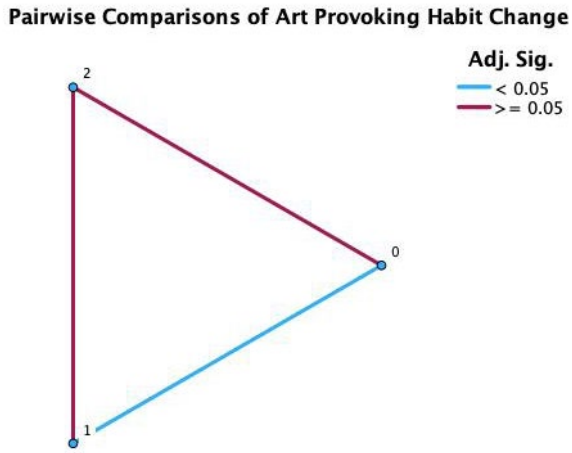
*Table 16. Pairwuse Comparison across groups.*

The highlighted areas in Table 16 indicate statistically significant differences and stronger effects. From this, it is evident that T1 had a significant impact across the primary variables compared to the control group, showing higher effectiveness in grabbing attention, prompting reflection, and provoking changes in habits. T2 also demonstrated significant differences, particularly in comparison to T1 and occasionally the control group. T2 often had a greater impact on specific measures, such as feelings towards buying fast fashion (compared to T1) and emotional engagement with the art (compared to control), though its effects were not consistent across all variables. The control group showed significant differences primarily on secondary measures (prompting mindful consumption and emotional responses), often in comparison to Treatment 1, but less consistently when compared to Treatment 2.

To visually represent these findings, the triangle of pairwise comparison distributions (Graph H and Graph I) illustrates the significance and magnitude of differences across groups for each question. Each node shows the sample average rank of the groups: 0 = control group, 1 = treatment 1, 2 = treatment 2. Lines connecting the vertices represent significant differences in responses, with colors indicating the level of significance. Red lines indicate significant differences with adjusted p-values less than 0.05 and the blue lines represent marginal significance with p-values between 0.001 and 0.05.




*Graph G. Pairwise Comparison plot for emotional engagement, mindful consumption, and attitudes towards fast fashion.*




*Graph H. Pairwise Comparison plot of DV how the art provokes participants to change habits question (Q4).*

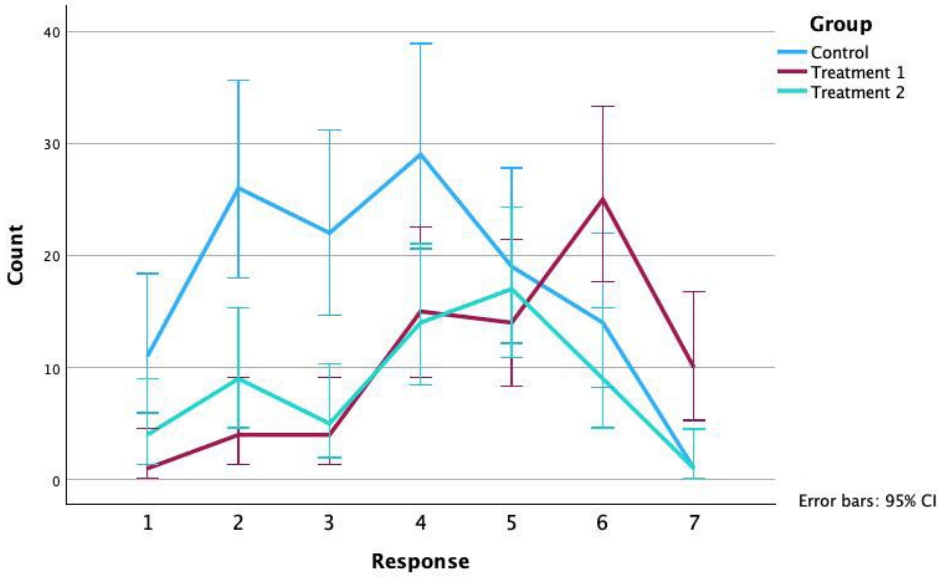
Across nearly all of the DV's, the pairwise comparison plot (Graph G) demonstrated uniform differences in group responses. This similar pattern across the questions on emotional engagement, mindful consumption, and attitudes towards fast fashion suggested that the impact of different art types is consistent for these aspects. Specifically, the red lines from Control to T2 and the blue lines from Control to T1 and T1 to T2 highlight significant and marginally significant differences respectively, indicating that the two AI images (T1 and T2) impact these measures differently from the traditional image and each other.

In contrast, Graph H reveals distinct differences between groups, with notable variations in significant pairwise comparisons. The red lines from Control to T2 and from T1 to T2, along with the blue line from Control to T1, underscore that the influence of art on changing habits varies significantly across groups, suggesting a unique and specific impact of the art types on this measure.

## Interaction Effects

In order to better understand how the different image types responded to each dependent variable, interaction plots were generated for each DV. These plots illustrate the distribution of responses across the Likert scale for Control, Treatment 1, and Treatment 2 groups. Across the three main DVs (art grabbing attention, prompting reflection and provoking habit change), the Control group had the largest number of participants. However, it did not show the highest frequency of responses in the higher values of the Likert scale.

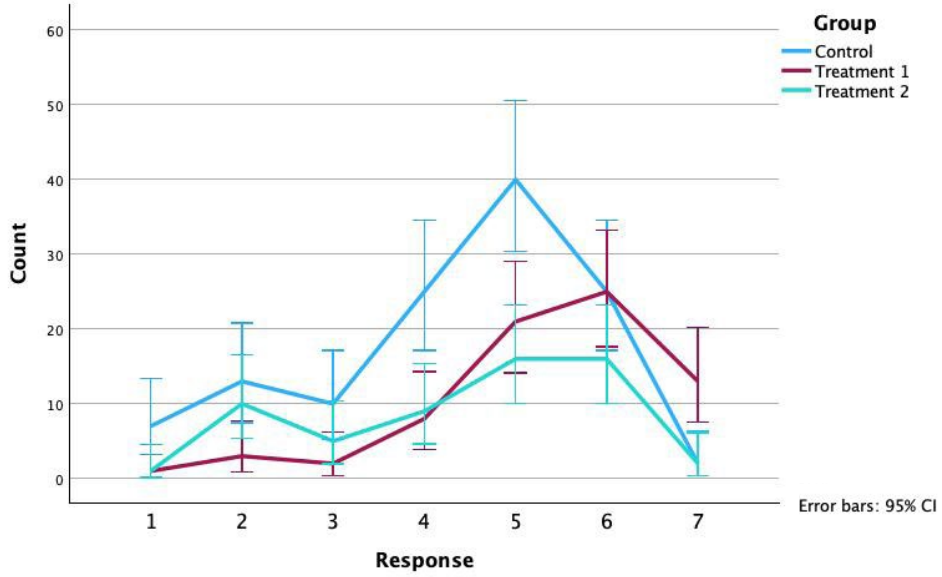
Overall, participants from T1 rated higher values (particularly 6, indicating "Agree") on the Likert scale and "Strongly Agree" (7) was the most frequent response across the different DVs for this same AI image group.




*Graph I. Interaction effect plots across groups for art grabbing participants attention question (Q5).*

For **Art grabbing attention**, T1 with approximately rated "Agree" (value of 5) regarding the AI visual effectively grabbing their attention, indicating that a considerable portion of participants felt the image was impactful in drawing their focus. T2 also showed a significant number of responses at the same level of agreement, though with slightly fewer participants than T1, suggesting that the AI image was still effective, albeit to a slightly lesser extent.

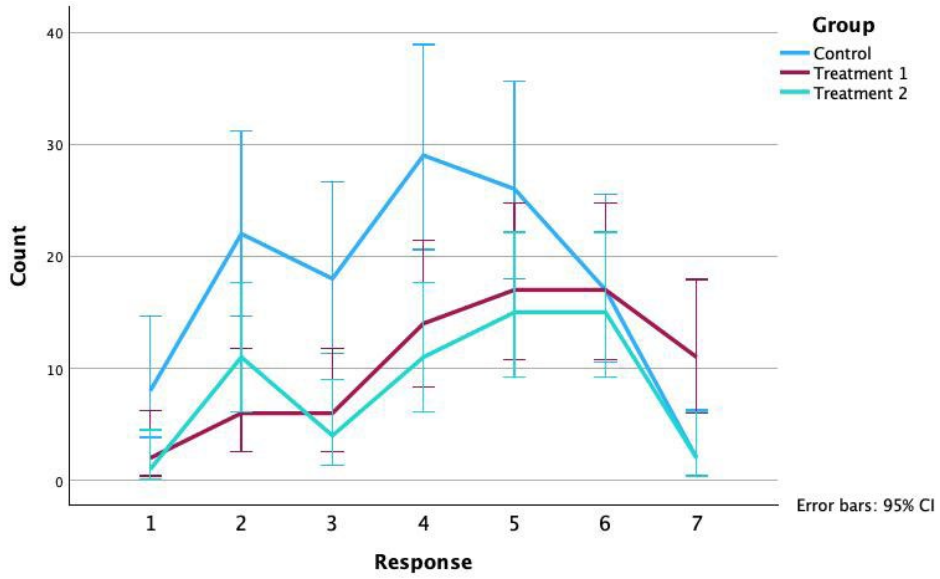
In contrast, the Control group, which was exposed to traditional art, demonstrated a more neutral response. About 30 participants rated their experience as "Neutral" (value of 4), reflecting a moderate level of attention captured by the traditional artwork. Additionally, around 25 participants actively disagreed (value of 2), indicating that for a sizable group, the traditional art did not succeed in grabbing their attention at all. This stark contrast highlights the more limited effectiveness of traditional art in engaging participants compared to the AI-generated visuals presented in T1 and T2.




*Graph J. Interaction effect plots across groups for art prompting participants to reflect on fast fashion (Q2).*

In regards to **Art prompting reflection on fast fashion**, T1 recorded the highest number of "Agree" responses (value of 6) with 15 participants expressing a strong level of agreement with the statement, indicating that T1 effectively prompted reflection on fast fashion. Similarly, T2 also had 15 participants rating "Agree" (value of 6), showing that this treatment also resonated with participants, but to a similar extent. However, a notable difference emerged in T2, where a portion of participants opted for "Somewhat Agree" (value of 5), reflecting a slightly more moderate but still positive response.

The Control group, on the other hand, showed a different pattern. The highest peak in this group was observed at the "Somewhat Agree" level (value of 5), with 40 participants selecting this option. This suggests that while traditional art did provoke some reflection, it did so to a more moderate degree compared to the AI-generated art, with fewer participants fully agreeing (value of 6) that it had a strong impact on their thoughts about fast fashion. This discrepancy highlights the relatively greater influence of the AI visuals in both T1 and T2 on encouraging participants to reflect on fast fashion, compared to the more moderate effect of traditional art.




*Graph K. Interaction effect plots across groups for art provokes participants to change habits question (Q4).*

For **Art provoking change of habits**, T1 and T2 exhibited similar patterns in responses, with both groups having the highest number of participants selecting "Agree" and "Somewhat Agree" (values of 6 and 5, respectively) when asked whether the art prompted a change in their habits. This indicates that both AI-generated images had a comparable and relatively strong effect on influencing participants' intentions to change their habits. The responses suggest a notable level of engagement and perceived impact from both treatments, with participants generally leaning towards agreement that the AI visuals had an influence.

In contrast, the Control group, while having the same number of "Somewhat Agree" responses (value of 5) as T1, showed a different trend. The largest proportion of Control group participants selected "Neutral" (value of 4), indicating uncertainty or ambivalence about whether the traditional art encouraged them to change their habits. This suggests that traditional art was less effective than the AI-generated images in sparking a decisive response or commitment to changing habits, with more participants feeling unsure about its impact.

## Persona Impact Across Groups

The analysis of further variables across the groups revealed that the ordinal regression model fit well in all cases, with p-values of 1.000 for Pearson and Deviance in the Control group, and $p = 1.000$ for Deviance and $p < 0.001$ for Pearson in both Treatment 1 and Treatment 2. Importantly, the **Persona variable had a significant effect in Treatment 1 ($p = 0.042$)**.

Among the personas, Mission Minded Matchmakers (MMM) were the most common across all groups: 52% in Treatment 1, 59% in Treatment 2, and 50% in the Control group. The proportions of Endless Fashion Hunters (EFH) and Shoppers for Experience (S4E) varied with treatments, indicating that the treatments may influence participant associations with these personas. Specifically, Treatment 1 had 26% EFH and 22% S4E, Treatment 2 had 22.4% EFH and 19% S4E, and the Control group had 29% S4E and 21% EFH.

In terms of interaction effects, **MMMs exhibited high responsiveness to AI-generated images, demonstrating strong attention, reflection, and behavioral change. EFHs showed a notable proportion of fast fashion reflection and were particularly attentive to AI images in Treatment 2.** Conversely, S4Es had a more neutral response to traditional art across all measures. Detailed tables supporting these findings are provided in the Appendix G.

**Robust Effectiveness of Treatment 1:**
With T1 demonstrating consistently high ratings in grabbing attention, prompting reflection, encouraging behavioral changes, as well as fostering mindfulness about clothing consumption, and feelings on buying fast fashion, it is evident that T1 effectively engages participants and exerts a broad influence. This confirms T1's substantial impact in these key areas.

**Targeted Impact of Treatment 2:**
T2's significant but variable effects indicate that it excels in targeted areas, such as emotional engagement and attitudes towards fast fashion. Although its impact is less consistent across different measures, this variability suggests that T2 has a strong influence in specific domains rather than a broad, uniform effect.

**Response Patterns of Control group:**
The less pronounced effects of control group as compared to T1 and T2 demonstrate that traditional art had a less significant impact on grabbing attention, prompting reflection, and provoking changes in habits.

**Prevalence and Engagement Insights of Personas:**
MMMs were the most prevalent across all groups, showing strong responses to AI-generated images, with high levels of attention, reflection, and behavioral change. EFH had significant reflection on fast fashion and notable attention to AI images in T2, showing its relevance for this persona.

Major takeaway from Main Study

# Chapter 6

# Discussion

The following section will discuss the results in the context of existing theories and literature, highlighting how different factors such as participants' awareness of fashion consumption and environmental issues, cultural and contextual influences, and personal experiences may have contributed to the observed outcomes. We will also explore the implications of these findings for the industry, the strategic design field and for future research,

# 6.1 Main Outcomes

The results of the main experimental study, delineated in Section 5.3.3 (Chapter 5), demonstrated that the **AI-generated image enhanced by the qualities of no color and zoom-in combined, produced effects in both treatment groups** as compared to the control group.

### *The Impact of AI Visual Art*

Treatment 1, featuring an AI-generated image of a woman seated amidst a large pile of clothes in the heart of Amsterdam, with a visibly sad expression, significantly outperformed the other conditions. This treatment exceptionally excelled in six different dimensions including capturing attention, enhancing cognitive engagement, prompting reflection, encouraging behavioral changes, fostering mindfulness about clothing consumption, and shaping emotional responses and attitudes towards fast fashion. Treatment 2, portraying a woman holding multiple shopping bags and having a multitude of shopping bags all around her, also outperformed the control group but only on two dimensions: in the perception impact of the image on the predisposition for changing habits and in capturing attention. This aligns with the theoretical frameworks discussed in Section 2.3 (Chapter 2), specifically Demmer et al. (2023), who found that participants experienced strong emotions and attributed intentions to computer-generated artworks, challenging the notion that AI art cannot evoke meaningful emotional responses. Although Demmer et al. (2023) noted that participants reported stronger emotions for human-created art when they knew that the artwork was created by human being, their study underscores that AI-generated images can still be highly effective in eliciting emotional and cognitive engagement, as demonstrated by the substantial impact of Treatment 1 and Treatment 2 in this research.

These insights are further validated by the pairwise comparisons and interaction plots of the Main Study, which revealed statistically significant distinctions in how participants responded to the different treatments. With the AI image in Treatment 1 consistently garnering the highest ratings across various dimensions, its broad effectiveness in engaging participants can be highlighted. Beyond excelling in attention capture, this image also significantly influenced cognitive engagement, reflection, and behavior change—critical components for shifting attitudes towards fast fashion. These results reinforce the concept that AI-generated visuals, particularly those evoking strong emotional cues, have the potential to foster deeper reflection and increased awareness of critical issues.

In contrast, Treatment 2 exhibited a more targeted impact, particularly excelling in capturing attention and influencing participants' predisposition toward changing habits. Although its effects were less consistent across all dimensions, Treatment 2 still outperformed traditional art (Control group) in these key areas. This suggests that AI-generated imagery can indeed create emotional and cognitive responses, even if its overall impact is more variable.

The Control group, exposed to traditional art, exhibited more neutral or negative responses across the primary variables, particularly with regard to attention and behavior change. While traditional art did prompt some reflection, it was less effective than the AI-generated visuals in engaging participants and driving actionable behavioral changes. These neutral responses highlight the potential of AI-generated art as a more powerful tool in influencing consumer behavior and shifting attitudes towards fast fashion.

Interestingly, the strong engagement of Endless Fashion Hunters (EFH) with AI-generated images, despite their anticipated lower value for attention and reflection, reveals the significant potential of AI visuals in targeting this audience. Given that EFH are the primary target for this project, their heightened responsiveness indicates that AI images effectively capture their interest and stimulate

reflection on fast fashion.

Additionally, since Mission Minded Matchmakers (MMM) represent the customer base targeted for shifting from mostly System 1 processing (EFH) towards System 2 processing (MMM), it is noteworthy that AI-generated images also had a substantial impact on MMMs. This impact was observed across key dimensions including attention, reflection, and behavioral change, demonstrating the versatility and effectiveness of AI imagery in engaging different persona types and achieving desired behavioral shifts.

## *Impact of Aesthetic Features on Emotional and Cognitive Responses*

The experimental findings resonate with the broader concept of color's impact on emotional and cognitive processing, emphasizing the power of aesthetic features as a strategy for socio-environmental impact in fashion. Rosenberg et al. (2018) and Zwaan et al. (2018) highlighted how both, color and forms, can influence immediate emotional and cognitive processing. The superior performance of Treatment 1 supports this view, particularly through the image's absence of color. The study revealed that even in a monochromatic tone, significant emotional responses can still be elicited, possibly due to the heightened focus on visual elements like form, contrast, and expression. Without the distraction of color, attention may shift towards these aspects, intensifying the emotional impact of the imagery. Additionally, the depiction of a distressing facial expression likely intensified participants' emotional responses. This supports Todd's (2023) observation that bodily reactions in visual imagery can intensify emotional experiences.

## *Influence of Visual Narratives on Sustainable Consumption*

The futuristic yet critical use of imagery in the study had a statistically significant impact on participants, prompting them to think deeply about their clothing consumption. This aligns with Goleman's (2021) observation that inspiring visuals can enhance self-motivation by reminding consumers of their sustainability goals and the positive impact of their actions, and Serrao et al. (2024) findings that empathetic engagement with art helps people recognize and understand their own emotions more clearly. The study thus demonstrates how creatively framed and contextually relevant content can expand upon existing literature, driving both engagement and reflection in a way that traditional methods may not.

The critical depiction of future fashion trends in Treatment 1 contrasts sharply with conventional portrayals used in the control group, highlighting the consequences of unsustainable consumption through a flood of clothes. This creative approach resonates with Trupp (2023), who emphasizes that while color enhances memory and associative thinking, the narrative and content of an image play a crucial role in emotional and cognitive responses. The results indicate that even without color, the compelling narrative of the AI-generated image significantly increased emotional engagement, reflection, and promptness to action, demonstrating the power of content over mere visual aesthetics. Additionally, Trupp (2023) highlights that enhanced cognitive engagement with visual content can result in increased appreciation and a stronger desire to revisit the experience. This reinforces the study's finding that AI-generated imagery, through its critical and thought-provoking narrative, effectively influences attitudes and behaviors towards fashion consumption.

While Treatment Group 1 exhibited the most consistent responses overall, it also produced the highest number of outliers, indicating a more polarized impact on participants. The image, featuring a woman with a sad expression surrounded by discarded clothing, was designed to evoke strong emotions such as guilt, sadness, or concern about overconsumption. This design likely resonated deeply with some participants, leading to intense emotional responses that resulted in outliers—where individuals either felt profoundly moved or were affected in a way that deviated significantly from the average response. This observation aligns with the literature on emotionally charged visuals, which suggests that even

those depicting negative emotions can be highly effective in engaging viewers and prompting deeper cognitive processing (Klöckner et al., 2018). Conversely, others may have found the emotional impact less significant, leading to more moderate or neutral responses.

### *Personal Experiences Shaping Responses to AI-Generated Art*

The context of the image, set against the backdrop of Amsterdam and featuring a woman engulfed by a pile of clothing, might resonate differently based on participants' awareness and attitudes toward fashion consumption and environmental issues. Individuals with a heightened awareness of fast fashion's impacts might find the image particularly compelling and thought-provoking, leading to more intense emotional responses. Conversely, those less engaged with these issues may not connect as strongly with the image, resulting in more moderate or neutral reactions. This differential impact can create polarized responses, where some perceive the image as a powerful critique and others as less influential. Moreover, the portrayal of the woman and her setting could be interpreted variably based on personal experiences and biases. Studies suggest that emotional responses to visual stimuli are often heightened when the content aligns with an individual's personal experiences or values (Smith et al., 2019; Jones & Green, 2017). Those more attuned to concerns about overconsumption or environmental degradation are likely to react more intensely to such imagery, reflecting their deeper engagement with these issues.

Additionally, it is possible to reflect upon the role of conceptual representations in art that the image's setting in Amsterdam might also have played some role in how participants interpret the visual message. It is possible to speculate that geographical differences might somewhat affect, although nowadays globalization tends to reduce the locality features. Therefore, it would be recommended that the name of the city or country is used as part of the image generating prompt, in order for the local characteristics not to work as intervenient variables.

The presence of outliers could also be explained by personal interests and motivations, as participants in the treatment group were given the option to choose between two questions in order to receive the images. In this study, the opportunity for self-selection likely intensified emotional responses, contributing to the observed variability. This aligns with the findings of Truppe et al. (2022), who suggest that emotional enhancement can be achieved through the self-selection of artwork. Future research could explore these individual differences further to understand better how different segments of the population respond to such imagery. Additionally, refining the content of the image or providing supplementary context could potentially reduce the variability and enhance its overall effectiveness. A recommendation to minimize variability based on user interest, could be showing one question per iteration without giving the user the possibility to choose amongst more than one question.

## Addressing the Research Gaps and New Insights

### *Bridging Environmental Awareness and Consumer Behavior*

This study sheds light on important research gaps related to connecting environmental awareness with consumer perception in the fast fashion industry. By evaluating the impact of AI-generated imagery that highlights the environmental consequences of fast fashion, the study demonstrates how such images can significantly help to influence consumer decision-making. The results revealed that black and white, zoomed-in images—particularly those generated by AI—were especially effective in capturing their attention and prompting consumers to reflect on their choices, contributing to a deeper engagement with the message about overconsumption and sustainability. These findings suggest that such impactful image compositions could enhance marketing and visual communication strategies. While fast fashion brands might be less inclined to adopt these practices due to their focus on rapid turnover and trends, there is a potential for more sustainable brands or those committed to

environmental issues to integrate such visuals into their strategies. By demonstrating a commitment to sustainability through thoughtful visual communication, brands can position themselves as leaders in environmental responsibility, appealing to increasingly eco-conscious consumers. This approach may also help differentiate these brands from their competitors, fostering greater consumer loyalty and setting them apart in a market where brand values are becoming more influential.

## *Emotional Engagement Drives Behavior Change*

One critical insight from this research was that awareness alone may not be sufficient to drive behavior change. Seock's (2024) findings underscore the importance of emotional engagement and concrete information in translating awareness into actionable behavior. The study revealed that factors such as reflection (Pascal et al., 2002), valence (Citron et al., 2016), and arousal (Roca et al. 2023) significantly influence how environmental messages are received and acted upon. A key element of this study was its focus on self-awareness, as discussed by Ajzen (2000), with the aim of deepening consumers' understanding of the environmental impacts linked to their purchasing intentions. The AI-generated images provided novel and emotionally compelling depictions of fast fashion's environmental consequences, facilitating a deeper understanding of these issues and encouraging more sustainable practices. Future research could further investigate how AI-generated imagery, combined with self-awareness interventions, influences long-term behavior change and whether such reflections translate into consistent, sustainable practices over time.

## *Psychological Distance in Messaging*

Another important insight relates to the concept of psychological distance and its relevance to environmental messaging, particularly through the use of AI-generated images. While this study did not directly assess the impact of aligning psychological distance with physical context, it was conceptually integrated into the project through the use of localized examples and familiar visual elements. The AI-generated images, such as those featuring Amsterdam and scenes of overconsumption, were designed to resonate with participants by providing a relatable and contextually relevant backdrop. This is confirmed in recent research that suggests that tailoring interventions to local contexts can enhance their effectiveness (e.g., Ding and Keh, 2017; De Vries & Fennis, 2019). Although the project utilized personas rather than analyzing how people in different countries specifically respond to environmental messaging, the incorporation of local relevance aimed to make the environmental messaging more relatable and impactful to the context of where this project is being developed, in the Netherlands. Future research could explore how directly aligning psychological distance with specific geographic contexts through AI-generated images might influence consumer behavior.

## *Loss-Framed Messaging in Fast Fashion*

Loss-framed messages used by some fashion companies (Patagonia, 2011; Freitag, 2019) to encourage more sustainable consumer behaviors have demonstrated a gap when it comes to application with major fast fashion giants. This study incorporated loss-framed messaging into the intervention design by embedding these concepts into the text accompanying AI-generated images. The images, created using AI technology, depicted the negative environmental consequences of fast fashion, effectively aligning with the loss-framing approach. Although this project did not specifically test these AI-generated interventions in fast fashion stores, the study highlighted how AI-generated imagery, combined with loss-framed messaging, can address gaps in current visual communication strategies. Future research could build on this by examining the effectiveness of such AI-generated loss-framed visuals in actual fast fashion retail settings to enhance their impact and more directly engage consumers in consumption awareness.

## *Generative Art's Impact*

With addressing the gap of environmental issues through using generative art within the fast fashion sector, results demonstrated that AI-generated art was highly effective in forging an emotional connection with the audience and prompting reflections on the environmental impact of fast fashion. Participants exposed to these AI-generated black and white, zoom-in images exhibited significant levels of reflection and consideration of their consumption choices. The study highlighted that AI's ability to create visually compelling and contextually relevant content played a key role in enhancing the emotional and cognitive impact of environmental messaging. By utilizing AI-generated imagery, fast fashion brands could effectively engage consumers and encourage more sustainable intentions, leveraging the unique strengths of generative art of automatism and personalization to drive meaningful change.

## *Exploring Visual Elements*

Finally, while existing literature on the emotional impact of visual elements such as color saturation and hue (Chatterjee et al., 2010) highlighted the importance of these factors in emotional engagement, this study highlights the critical role of AI in shaping and enhancing socio-environmental messaging. The findings demonstrate that AI-generated images—regardless of color—can significantly influence the impact of environmental messages, illustrating AI's potential to refine and personalize visual communication. Future research should focus on how AI capabilities could further refine visual techniques to maximize emotional impact and engagement in environmental messaging. This focus on AI will be crucial in advancing our understanding of its role in enhancing the effectiveness of visual communication strategies.

## *Personalization of Visual Content*

The persona analysis demonstrated that tailoring images based on consumer profiles can enhance the impact of the visual content. By first identifying the consumer's persona and then presenting the most relevant image, the experience becomes highly customizable and more effective. This approach ensures that both the type of questions asked and the images shown are specifically aligned with each consumer's preferences and behaviors, leading to a more personalized and engaging interaction.

## *Consumer Preferences*

Experiment 1 revealed that consumer preferences were more nuanced than initially expected. The Mission Minded Matchmaker responded best to messages emphasizing product necessity and quality, while The Shopper for Experience preferred a mix of quality, practicality, and current trends. The Endless Fashion Hunter, unexpectedly, valued quality and practicality alongside trends, indicating a complex decision-making process. In terms of purchasing motivations, Mission Minded Matchmakers primarily cited replacing worn-out clothes, but unexpected factors also played a role. The Endless Fashion Hunter's balanced approach highlighted a departure from solely trend-focused decisions, emphasizing a mix of quality and practicality. Moreover, the artworks moderately prompted reflection and behavior change, suggesting that to strongly elicit emotional responses or capture attention, specific imagery content can be tested in future studies to evaluate what increases overall impact for individuals.

## *Industry implications*

*Why is it relevant for companies to have this intervention?*

Since reducing overconsumption after all means reducing the speed of consumption, one might wonder if this objective does not go against the desire for profit of companies, leading to a threat to their growth objectives in the market. Although this reflection might be reasonable, it is necessary to take into consideration a broader view of the multidimensionality of the market itself. In an increasing competitive scenario and a more complex contemporary society, other factors increasingly play important roles.

Fordism's theoretical principle of production intensification was developed in a time where the major challenge was to deliver more goods for people with fewer resources to be able to consume, a very striking reality at the beginning of the last century. Nowadays, access to goods is just one of a set of factors that influence the purchasing behavior of different population groups. Identifying with other values of the brand that one consumes, including ethical and symbolic values, has become a reality for a massive and growing number of people. Valuing environmental protection, the health of a company's workers, and its bioethical and sustainability commitments are characteristics that are increasingly sought after in a brand's industrial and commercial practices.

At the same time, some fashion companies have incorporated and promoted the defense and implementation of practices associated with these values as inherent and distinguishing features of their brands. Their identity has been increasingly linked to these aspects, as a differential from other companies in the market, following a growing trend of changing the mindset of many consumers. These brands know that they contribute to decreasing carbon emission in the planet's atmosphere, benefiting the harmonization and balance of biomes and geographic regions, their natural resources, and the populations that live in them.

For the strategic design area, this study contributes to brands by presenting a design strategy for creating a stronger emotional connection with their consumers with the use of AI-generated art in visual strategies. This emotional engagement can lead to increased awareness and more responsible purchasing decisions. The study opens doors for setting brands apart in a competitive market and position themselves as disruptors in the market, addressing consumers to think responsibly and go against the current of overconsumption, bringing more trust, and attracting a new pool of consumers.

## *Environmental impact of AI*

While the study highlights AI's potential, it also acknowledges the environmental concerns associated with AI technology. To address this, the concept allows brands to pre-select the number of images generated by the AI, thereby attempting to manage in minimizing the substantial resources required for AI development and operation. However, companies might still find it irrelevant or even contradictory to implement such a strategy in-store, given that it consumes considerable energy. Similarly, consumers could view this as an ironic attempt to promote environmental reduction through a technology that itself has a considerable environmental footprint. Furthermore, it is important to highlight potential skepticism regarding the genuine commitment of fast fashion brands to sustainability, especially given the industry's notorious environmental impact. Consumers may perceive AI initiatives as superficial or insincere, potentially leading to backlash or disengagement, if these efforts are seen as merely a marketing gimmick.

To address these possible issues, brands must not only develop clear policies on the use of AI but also communicate clearly about how this technology aligns with their broader sustainability goals. This transparency must extend beyond the exclusive use of specific AI interventions used in marketing to also include information about how AI is applied across the organization. Brands must outline how AI contributes to measurable improvements in product offerings, supply chain practices, and corporate policies. Additionally, brands should evaluate whether AI is the most effective tool for achieving their sustainability objectives or if alternative strategies might offer more substantial benefits with less environmental impact. This approach ensures that AI is perceived as a genuine component of a broader commitment to ethical principles and responsible consumption, rather than just a marketing tool.

# 6.2 Limitations and Future Research

## *Literature Research*

With the increasing use and accessibility of AI in society, new developments and applications are continually emerging. As a result, this project may not fully encompass all recent advancements in generative AI art within the fashion and marketing industry. To address this limitation, future research should continue to explore this topic through comprehensive literature reviews, ensuring a continuously updated theoretical foundation.

## *User Study*

Participant bias was a potential bias due to the lack of classification by economic class. While the study aimed to gather a general understanding of consumer attitudes and behaviors across different shopper types, including those with varying levels of engagement with fast fashion, the sample primarily consisted of individuals from a Master of Science program, which may not fully represent the diverse economic backgrounds of fast fashion consumers. This is particularly relevant in the context of fast fashion, where economic factors might influence purchasing decisions. Although fast fashion caters to a broad range of demographic groups, including varying economic, geographical, educational, and cultural backgrounds, this study's sample may not accurately reflect the purchasing behaviors of individuals from lower economic strata. Future research should consider incorporating a more diverse sample that includes a broader range of economic backgrounds to provide a more comprehensive view on consumption patterns of newly produced fast fashion goods, mitigating potential biases. Although fast fashion products can be sold as second-hand items, this study is specifically focused on the consumption of newly produced fast fashion goods, which are central to the industry's mass market segmentation and are producing much more waste. The second-hand market operates under different dynamics, as a sustainable business model.

## *The Service Experience*

In this project, the concept of driving behavior change is envisioned as a long-term outcome.The immediate impact is achieved through an experience that heightens awareness using images depicting the environmental consequences of fast fashion. Due to time constraints, the study did not evaluate the long-term effects of behavior change. Developing a habit requires repeated actions within a specific context, which increases the likelihood of the behavior being repeated in similar circumstances in the future. However, not all habits result from intentional behavior change; some may form through different processes or contexts. Future research could further investigate this by transforming the concept into a prototype and implementing it in a retail environment over an extended period. This approach would allow for the assessment of how repeated exposure to the visual content influences long-term perception changes.

## *Potential bias in AI algorithm*

The lack of transparency regarding the data source used by the AI tool for the concept may lead to algorithmic bias. While the immediate concern of algorithmic bias is less relevant for this particular experimental study, due to the meticulous design of the prompts and the evaluation of the generated images, it remains essential to be aware of potential biases inherent in AI tools. When applying them, it is important to incorporate strategies to monitor and mitigate these potential biases to ensure that the generated content aligns with intended ethical and design standards. While efforts were made to convey the real-world environmental consequences of the fast fashion supply chain, these artworks may not effectively translate across different cultural contexts. The effectiveness of the visual content in promoting sustainable behaviors could vary significantly when applied in diverse cultural or geographic settings. Future research could explore the performance of AI-generated images in various cultural settings to better understand their effectiveness in conveying environmental messages. It would also be valuable to investigate how to adapt visual content to align with different cultural values and norms while maintaining

its impact on environmental awareness. This approach could ensure that messages about environmental consequences remain relevant and compelling to diverse audiences.

## *Generation of images*

In the image generation phase of the study, each prompt yielded four different seed images. To ensure that the images met the specific criteria and effectively addressed the research objectives, an average of 5-10 iterations per prompt was required. This process resulted in a pool of approximately 40 images from which only a single image was selected for each prompt used in the study. Although the images generally aligned with the prompts, visualizing the exact intention of the researcher was challenging. This iterative process underscores a significant limitation in the current image generation methodology: the need to generate numerous images and sift through them to select the most appropriate one highlights the difficulty in achieving precise and efficient image outcomes only through automated procedures without human mediation. Such limitations could pose challenges if the project were to be applied in practical industry settings, particularly with brands, where efficiency and accuracy are crucial and time is limited.

To address this limitation in future applications, especially in industry settings, the development of a more advanced AI model in terms of diversity and specificity in its output is essential. Such advancements could improve the accuracy of the generated images, reducing the number of required iterations and providing more precise control over the aimed visual content. This would streamline the image generation process and enhance the effectiveness of visual stimuli in both research and practical applications. With the advancement of AI technology, the need to have human interference and interactions has the tendency to reduce, due to the quality improvement of tools to generate images. Even with future implementations, it is essential to include mechanisms for human review to ensure that the generated content remains ethical and free from unintended biases.

## *Experiment 2*

Future work could be done on the comparison of image content to study if there is any influence on making better decisions. Specifically, studies could examine how various visual elements—such as realistic vs. conceptual images, static vs. dynamic content, or AI-generated vs. traditional artwork—affect consumers' choices and their awareness of environmental impacts. This could provide insights into optimizing visual content strategies for encouraging environmentally conscious consumption.

## *Practical Applications*

The study revealed that visual images have a significant impact on consumer perceptions, underscoring the potential for further development and evaluation of this concept in real retail environments. The findings suggested that personalized visual content can be adapted to various stages of the fashion shopping process to enhance its effectiveness. For instance, integrating the visual concept into online shopping platforms could be particularly beneficial. Since seamless payment options, such as Apple Pay, might inadvertently encourage overconsumption, to counteract this, implementing the visual concept at some stage of the acquisition process may serve as a reminder of the environmental impact before the purchase is completed. This approach would function similarly to apps that monitor screen time, providing notifications to raise awareness about the environmental consequences of purchasing decisions.

By shifting the responsibility of raising awareness from fast fashion brands to external entities, this strategy could promote more mindful consumption. Such adaptations have the potential to bridge the gap between impulsive buying behaviors and sustainable choices, fostering greater environmental responsibility in fashion shopping. This concept represents promising areas for future research, which could explore its applicability in diverse retail contexts and develop strategies for integrating environmental consequences as visual prompts into the shopping experience.

# Chapter 7

# Conclusion

Dive into the final considerations of this long experimental journey. Explore the conclusions drawn and personal insights gained. Let's reflect on the process and its impact together.

# 7.1 Conclusion

In fashion, where impulse buying and environmental concerns frequently clash, understanding perceptions of consumers regarding these conflicting behaviors is crucial. This thesis employed both qualitative and quantitative methods to assess the impact of AI-generated images compared to traditional visual art on consumer perceptions of environmental impact. The research highlights that personalizing visual content based on consumer profiles enhances the effectiveness of prompts toward environmentally conscious choices, thus offering valuable insights for marketing strategies.

The study reveals that AI-generated imagery significantly improves consumer engagement and prompts meaningful reflection on fast fashion and sustainability. This investigation also uncovers several underexplored areas for further research and practical application. The results suggest that while AI-generated images are effective, there are additional dimensions worth to be studied in order to deepen our understanding and refine practical strategies. While many future research directions were discussed in the previous chapter, key dimensions to keep in mind include: influence of repeated exposure of visuals for long-term awareness, assessing the effectiveness of AI-generated images across different cultural contexts to maintain its relevance and impact, studying how local versus global contexts influence the effectiveness of environmental messages, and investigating the integration of environmental imagery into different stages of the shopping process (online and offline) to influence consumer decision-making and reduce overconsumption.

# 7.2 Personal Reflection

From the moment I began my studies at TU Delft, I was eager to apply my skills to a project that would connect people, cultures, and sustainability. After completing the “Manage Your Masters” course, I had a clear vision of a project I was passionate about pursuing. Unfortunately, due to the heavy demands of university life, I couldn’t dive into it right away. However, my graduation thesis finally gave me the opportunity to bring this project to life.

During my master’s journey, I discovered the transformative power of Artificial Intelligence. Engaging with AI across multiple projects, I grew increasingly fascinated by its implications and the discussions it sparked as a technology that has rapidly gained traction in the mass market. This newfound interest reshaped my initial project idea, leading me to incorporate both AI and art to combine them with the other concepts. With that came my challenging endeavor to *Stimulating Consumers to Slow Down Consumption with Generative AI Art: Designing for Socio-Environmental Impact.*

Working with generative AI art, as I explored within my thesis, was far from easy. There were numerous iterations and adjustments required, but I firmly believe that co-creating with AI tends to be a significant part of our future. This research experience pushed me to challenge myself further, particularly when I took on developing quantitative experimental studies and analysing the results with SPSS—pushing me to develop new skills. Venturing into this unfamiliar territory was daunting, but it enriched my understanding of both AI and data analysis.

I was often faced with making critical decisions independently, though I sought and received very good feedback from my team that always stimulated deep reflections. Receiving constant support, I ultimately had to trust my own judgment. Along the way, I confronted my limitations as a young researcher gaining more experience and recognized that my true passion lay in exploring the theoretical aspects of the project. This realization meant accepting that no working prototype would be developed—a decision that, while difficult, was necessary given the time constraints. This allowed me to dive deeper into the theoretical foundations of the work, increasing its robustness, and to address the effort to develop a proof of concept.

Always reflecting about the potentialities of these interdisciplinary connections, I had to prioritize and limit my scope. The structured environment at TU Delft, with its focus on adhering to rubrics, helped me to direct my creativity to explore a process capable of changing perceptions of a social culture. Throughout the project process, I enhanced skills to set personal deadlines and, more importantly, to be at peace with not always meeting them. Through being encouraged by my Graduation team, I developed a stronger sense of responsibility for my actions.

Ultimately, this project has been an incredibly rewarding experience in many aspects of my personal and professional development. I am deeply satisfied with reaching this milestone in my academic journey—completing my Master’s degree, a dream I have long held. If given the chance, I would love to continue working on it, and I am excited about the possibilities for taking this further in the future.

# Biblio graphical References

# A


Aaker, J. (2000). Accessibility Or Diagnosticity? Disentangling the Influence of Culture on Persuasion Processes and Attitudes. Journal of Consumer Research. 26. 340-57. 10.1086/209567.

Abdul, Q., Ahmad, I., Sri, H. (2024). The Comparison of the Effectiveness and Efficiency of Fine-Tuning Models on Stable Diffusion in Creating Concept Art. JURNAL TEKNIK INFORMATIKA. 17. 21-29. 10.15408/jti.v17i1.37942.

Adamaszek, M., Cattaneo, Z., Ciricugno, A., and Chatterjee, A. (2022). "The cerebellum and beauty: the impact of the cerebellum in art experience and creativity" in The emotional cerebellum. Eds. Adamaszek, M., Manto, M., and Schutter, D. J. (Cham: Springer International Publishing), 213–233.

Adjei, Mavis T., Stephanie M. Noble, and Charles H. Noble (2010) The Influence of C2C Communications in Online Brand Communities on Customer Purchase Behavior, Journal of the Academy of Marketing Science, 38 (5), 634-653.

Ads of the World (2024). Atacama Fashion Week - Turning Trash into Fashion. https://www.adsoftheworld.com/campaigns/atacama-fashion-week-turning-trash-into-fashion

Alain, C., Moussard, A., Singer, J., Lee, Y., Bidelman, G., Moreno, S. (2019). Music and Visual Art Training Modulate Brain Activity in Older Adults. Frontiers in Neuroscience. 13. 182. 10.3389/fnins.2019.00182.

Alam, A., & Mohanty, A. (2023). Educational technology: Exploring the convergence of technology and pedagogy through mobility, interactivity, AI, and learning tools. Cogent Engineering, 10(2). https://doi.org/10.1080/23311916.2023.2283282

Amin S and Tarun T 2020 Effect of consumption values on customers' green purchase intention: a mediating role of green trust Social Responsibility Journal 17 1320–36

Andreadakis, S., & Owusu-Wiredu, P. (2023). Fashion Footprint: How Clothes Are Destroying Our Planet and the Growing Impacts of Fast Fashion. IntechOpen. doi: 10.5772/intechopen.1002000

Ajzen, I. (1991) The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, Volume 50, Issue 2, 1991, Pages 179-211, ISSN 0749-5978, https://doi.org/10.1016/0749-5978(91)90020-T.


# B


Beelders, T., Bergh, L. (2020). The role that composition plays in determining how a viewer looks at landscape art. Journal of eye movement research, 13(2), 10.16910/jemr.13.2.13. https://doi.org/10.16910/jemr.13.2.13

Belfiore, E., & Bennett, O. (2007). Determinants of Impact: Towards a Better Understanding of Encounters with the Arts. Cultural Trends, 16(3), 225–275. https://doi.org/10.1080/09548960701479417

Bhandari, U., Chang, K., Neben, T. (2019) Understanding the impact of perceived visual aesthetics on user evaluations: An emotional perspective, Information & Management, Volume 56, Issue 1, Pages 85-93, ISSN 0378-7206, https://doi.org/10.1016/j.im.2018.07.003.

Bianchi C, Birtwistle G. 2010. Sell, give away, or donate: an exploratory study of fashion clothing disposal behaviour in two countries. The International Review of Retail, Distribution and Consumer Research 20(3): 353–368.

Bick, R., Halsey, E. & Ekenga, C.C. The global environmental injustice of fast fashion.Environ Health 17, 92 (2018). https://doi.org/10.1186/s12940-018-0433-7

Blanchard T. 2013. Green is the New Black: How to Save the World in Style. Hodder & Stoughton: Hachette UK.

Bird, J. J. (2022). Continuation of Famous Art with AI: A Conditional Adversarial Network Inpainting Approach. http://arxiv.org/pdf/2110.09170v3

Bland, D. (2012) Agile coaching tip—What is an empathy map?. http://www.bigvisible.com/2012/06/ what-is-an-empathy-map/

Boris Dayma, Suraj Patil, Pedro Cuenca, Khalid Saifullah, Tanishq Abraham, Phúc Lê Khac, Luke Melas, and Ritobrata Ghosh. 2021. DALLE Mini. https://doi.org/10.5281/zenodo.1234

Bray JP. 2009. Ethical dimensions in clothing purchase. First Annual Ethics in Everyday Life Conference, 17–19 March, Salzburg.

Brooke, L. (2022) Athens Journal of Humanities & Arts - Volume 9, Issue 3. Pages 211-232 http://www.athensjournals.gr/humanities/2022-9-3-2-Brook.pdf

Brostow, G., Cissé, M., Farinella, G.M., Hassner, T. (eds) Computer Vision – ECCV 2022. ECCV 2022. Lecture Notes in Computer Science, vol 13696. Springer, Cham. https://doi.org/10.1007/978-3-031-20059-5_41

# C


Cachon, G.P.; Swinney, R. The Value of Fast Fashion: Quick Response, Enhanced Design, and Strategic Consumer Behavior. Manag. Sci. 2011, 57, 778–795.

Caivano, Jose. (2022). Black, white, and grays: Are they colors, absence of color or the sum of all colors?. Color Research & Application. 47. 252-270. 10.1002/col.22727.

Caro, F., Martínez-de-Albéniz, V. (2015). Fast Fashion: Business Model Overview and Research Opportunities. In: Agrawal, N., Smith, S. (eds) Retail Supply Chain Management. International Series in Operations Research & Management Science, vol 223. Springer, Boston, MA. https://doi.org/10.1007/978-1-4899-7562-1_9

CBI. (2023) What is the demand for apparel on the European market?. https://www.cbi.eu/market-information/apparel/what-demand

Chartrand, T. (2005) The Role of Conscious Awareness in Consumer Behavior, Journal of Consumer Psychology, Volume 15, Issue 3, Pages 203-210, ISSN 1057-7408, https://doi.org/10.1207/s15327663jcp1503_4.

Chatterjee, A., Widick, P., Sternschein, R., Smith, W. B., & Bromberger, B. (2010). The Assessment of Art Attributes. Empirical Studies of the Arts, 28(2), 207-222. https://doi.org/10.2190/EM.28.2.f

Chen, Y.L., Hsu, C.T.: Towards deep style transfer: a content-aware perspective. In: BMVC (2016)

Christensen AP, Cardillo ER, Chatterjee A. What kind of impacts can artwork have on viewers? Establishing a taxonomy for aesthetic impacts. Br J Psychol. 2023 May;114(2):335-351. doi: 10.1111/bjop.12623. Epub 2022 Dec 14. PMID: 36519205.

Costa, G. (2021) The True Cost of Clothes: Sustainability Issues in the Fashion Industry. Student Theses 2015-Present. 111. https://research.library.fordham.edu/environ_2015/111


# D


Das B, Chakrabarti D (2021) Image is a tangible element of visual communication: role of the image to increase social awareness. In: Design for tomorrow, vol 3. Springer, Singapore, pp 783–793

Darda, K.M., Chatterjee, A. The impact of contextual information on aesthetic engagement of artworks. Sci Rep 13, 4273 (2023). https://doi.org/10.1038/s41598-023-30768-9

David L. Bimler, Megan Snellock, Galina V. Paramei. (2019) Art expertise in construing meaning of representational and abstract artworks, Acta Psychologica, Volume 192, Pages 11-22, ISSN 0001-6918, https://doi.org/10.1016/j.actpsy.2018.10.012.

Davis, H. (2023). Where art meets sustainability and politics. Creative Insight - Creative Review. https://www.creativereview.co.uk/jeremy-hutchison-dead-white-man-art-sustainability/

Daystar, J.; Chapman, L.L.; Moore, M.M.; Pires, S.T.; Golden, J. Quantifying apparel consumer use behavior in six countries: Addressing a data need in life cycle assessment modeling. J. Text. Appar. Technol. Manag. 2019, 11, 1–25.

Dhali K, Al Masud A, Hossain M A, Lipy N S and Chaity N S 2023 The effects of abusive supervision on the behaviors of employees in an organization Social Sciences & Humanities Open 8 100695

DW. (2024) DataWagashi. https://datawagashi.com.


# E


EC. (2023). Enabling Circularity through transparency: Introducing the EU Digital Product Passport

EC. (2023). The EU Digital Product Passport shapes the future of value chains: What it is and how to prepare now.

Elharrouss, O., Almaadeed, N., Al-Maadeed, S., & Akbari, Y. (2020). Image inpainting: A review. Neural Processing Letters, 51, 2007-2028.

European Green Deal (2020).COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE EUROPEAN COUNCIL, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF

# F

Farnsworth BE (2011) Conservation photography as environmental education: focus on the pedagogues. Environ Educ Res 6(17):769–787

Fei, B., Lyu, Z., Pan, L., Zhang, J., Yang, W., Luo, T., Dai, B. (2023). Generative diffusion prior for unified image restoration and enhancement. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (pp. 9935-9946).

Ferreira, B., Williamson, S., Oliveira, E., Conte, T. (2015). Designing Personas with Empathy Map. 10.18293/SEKE2015-152.

Nake, F. (2007) Computer Art: Creativity and Computability. In Proceedings of the 6th ACM SIGCHI Conference on Creativity & Cognition (Washington, DC, USA) (C&C '07). Association for Computing Machinery, New York, NY, USA, 305–306. https://doi.org/10.1145/1254960.1255041

Frijda, N. H., Sundararajan, L. (2007). Emotion refinement: a theory inspired by Chinese poetics. Perspect. Psychol. Sci. 2, 227–241.

Fu, T.J., Wang, X.E., Wang, W.Y. (2022). Language-Driven Artistic Style Transfer. In: Avidan, S., Tham, Mathilda. 2008. Lucky People Forecast: A systemic futures perspective on fashion and sustainability. Doctoral thesis, Goldsmiths, University of London [Thesis]

# G

Galafassi, D. et al. (2018) Raising the Temperature: The Arts on a Warming Planet. Current Opinion in Environmental Sustainability 31: 71-79

Ganesh, J., Arnold, M., Reynolds, K. (2000) Understanding the Customer Base of Service Providers: An Examination of the Differences Between Switchers and Stayers, Journal of Marketing, 64 (3), 65-87.

Gatys, L.A., Ecker, A.S., Bethge, M. (2015) A neural algorithm of artistic style. arXiv:1508.06576

Gatys, L.A., Ecker, A.S., Bethge, M., Hertzmann, A., Shechtman, E. (2017) Controlling perceptual factors in neural style transfer. In: CVPR

Gazi, A et al. (2024) The green mindset: how consumers' attitudes, intentions, and concerns shape their purchase decisions. Environ. Res. Commun. 6 025009

Goedhart, A. (2020, July 24). Non-verbal communication skills of clothing. Master Arts, Culture & Society. Retrieved from http://hdl.handle.net/2105/55938

Goleman, D. (1995). Emotional intelligence. Bantam Books, Inc.

Goleman, D. (2021), LEADERSHIP BLINDSPOTS. Leader to Leader, 2021: 22-25. https://doi.org/10.1002/ltl.20564

Golinkoff. (2015). Supermarket Speak: Increasing Talk Among Low-Socioeconomic Status Families. International Mind, Brain, and Education Society and Wiley Periodicals. Volume 9, Number 3.https://kathyhirshpasek.com/wp-content/uploads/sites/9/2018/06/3.-Supermarket-Speak-Ridge-et-al..pdf

Gratch, J., Marsella, S., Mao, W. (2006). Towards a Validated Model of Emotional Intelligence.

Grusec, J. E. (1994). Social learning theory and developmental psychology: the legacies of Sears, R.R; Bandura, A.

# H

Hahn, U., Berkers, P. (2020) Visualizing Climate Change: An Exploratory Study of the Effectiveness of Artistic Information Visualizations (World Art), 1-25;

Han Qiao, Vivian Liu, and Lydia Chilton. 2022. Initial Images: Using Image Prompts to Improve Subject Representation in Multimodal AI Generated Art. In Creativity and Cognition (C&C '22), June 20–23, 2022, Venice, Italy. ACM, New York, NY, USA 14 Pages. https://doi.org/10.1145/3527927.3532792

Hossain M J, Hossain M A, Hossain M S, Masud A A, Yesmin M N and Wu R 2023a Investigating consumers' intentions regarding the adoption of mobile payments: an SEM-based empirical investigation Asian Economic and Financial Review 13 662–76

Hudson, D.A., Zoran, D., Malinowski, M., Lampinen, A.K., Jaegle, A., McClelland, J.L., Matthey, L., Hill, F., & Lerchner, A. (2023). SODA: Bottleneck Diffusion Models for Representation Learning. ArXiv, abs/2311.17901.

Hutchinson, R., Eardley, A. F. (2023). 'I felt I was right there with them': the impact of sound-enriched audio description on experiencing and remembering artworks, for blind and sighted museum audiences. Museum Management and Curatorship, 1–18. https://doi.org/10.1080/09647775.2023.2188482

Hsu, J.L. and Lin, T. (2015), "Carbon reduction knowledge and environmental consciousness in Taiwan", Management of Environmental Quality: An International Journal, Vol. 26 No. 1, pp. 37 -52. https://allacademic.com/meta/p111527_index.html

Hwang, C., Lee, Y., Diddi, S. and Karpova, E. (2016). "Don't buy this jacket" Consumer reaction toward anti-consumption apparel advertisement. Journal of Fashion Marketing and Management, Vol. 20 No. 4, pp. 435-452. https://doi.org/10.1108/JFMM-12-2014-0087

# I

Imagen2. Deep Mind Google. https://deepmind.google/technologies/imagen-2/

Ismail A.I.H., Isa K.M, Azahari M.H.H. (2010) An interpretation of photography as an art and communication. In: 2010 International conference on science and social research (CSSR 2010). IEEE, pp. 1350–1352

# J

Jacobs, R. H., Haak, K. V., Thumfart, S., Renken, R., Henson, B., and Cornelissen, F. W. (2016). Aesthetics by numbers: links between perceived texture qualities and computed visual texture properties. Front. Hum. Neurosci. 10:343. doi: 10.3389/fnhum.2016.00343

Jacoby, J. (1976) Consumer psychology: An octennium. Annu. Rev. Psychol. 27, 331–358.

James, C., Tingaud, M., Laera, G., Guedj, C., Zuber, S., Palazzi, R., Vukovic, S., Richiardi, J., Kliegel, M., Damien. M. (2024). Cognitive enrichment through art: a randomized controlled trial on the effect of music or visual arts group practice on cognitive and brain development of young children. BMC Complementary Medicine and Therapies. 24. 10.1186/s12906-024-04433-1.

Jiménez-Sánchez, M., Lafuente, R. (2010). Defining and measuring environmental consciousness. Revista Internacional de Sociologia. 68. 10.3989/ris.2008.11.03.

Jing, Y., Yang, Y., Feng, Z., Ye, J., Yu, Y., Song, M. (2017) Neural style transfer: a review. arXiv:1705.04058

Johnstone, L., Lindh, C. (2022) Sustainably sustaining (online) fashion consumption: Using influencers to promote sustainable (un)planned behaviour in Europe's millennials, Journal of Retailing and Consumer Services, Volume 64, 102775, ISSN 0969-6989, https://doi.org/10.1016/j.jretconser.2021.102775.

Johnson, J., Alahi, A., Fei-Fei, L. (2016) Perceptual losses for real-time style transfer and super-resolution. In: ECCV
Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk. Econometrica, 47(2), 263-291.

# K

Katherine E. Ridge, Weisberg, Hande Ilgaz, Kathryn A. Hirsh-Pasek, and Roberta Michnick

Katsikopoulou, M. (2024) A glimpse into the best of art dubai week 2024. Design Boom. https://www.designboom.com/art/best-art-dubai-week-2024-03-16-2024/

Kim, N., Lee, K. (2023). Environmental Consciousness, Purchase Intention, and Actual Purchase Behavior of Eco-Friendly Products: The Moderating Impact of Situational Context. International journal of environmental research and public health, 20(7), 5312. https://doi.org/10.3390/ijerph20075312

Kirk, U., Skov, M., Hulme, O., Christensen, M. S., and Zeki, S. (2009). Modulation of aesthetic value by semantic context: an fMRI study. NeuroImage 44, 1125–1132. doi: 10.1016/j.neuroimage.2008.10.009

Kodžoman, D. (2019). THE PSYCHOLOGY OF CLOTHING: Meaning of Colors, Body Image and Gender Expression in Fashion. Textile & Leather Review, 2 (2), 90-103. https://doi.org/10.31881/TLR.2019.22

Koley, S., & Reich, B. (2023). Bought but never used: How and when unused utility reduces subsequent spending. Psychology & Marketing, 40, 1953–1964. https://doi.org/10.1002/mar.21883

# L

Langacker,R. W. (2008).Cognitive Grammar. A basic introduction.Oxford University Press. 10.1093/acprof:oso/9780195331967.001.0001

Lawrence, J., & Mekoth, N. (2023). Demarketing for

Lemon, K.N., Verhoef, P.C. (2016). Understanding Customer Experience Throughout the Customer Journey. Journal of Marketing, 80(6), 69-96. https://doi.org/10.1509 jm.15.0420

Lesley Duxbury, "A Change in the Climate: New Interpretations and Perceptions of Climate Change through Artistic Interventions and Representations," Weather Climate and Society 2, no. 4 (2010): 294-299

Li, E. (2022). Research on Visual Expression of Color Collocation in Art Education Based on Art Psychology. International Journal of Education and Humanities. 3. 27-31. 10.54097/ijeh.v3i3.1005.

Roosen, L. J., Klöckner, C. A., Janet K. S, (2018). Visual Art as a Way to Communicate Climate Change: A Psychological Perspective on Climate Change-Related Art. World Art 8, no. 1: 85-110

Loong, T. (2023). The Beauty of NeuroAesthetics. https://www.linkedin.com/pulse/beauty-neuroaesthetics-dr-terry-loong/

Lukin, E., Krajnović, A., Bosna, J. (2022). Sustainability strategies and achieving sdgs: a comparative analysis of leading companies in the automotive industry Sustainability 14 4000

Luna-Jiménez, C., Gil-Martín, M., D'Haro, L., Fernández-Martínez, F., San-Segundo, R. (2024) Evaluating emotional and subjective responses in synthetic art-related dialogues: A multi-stage framework with large language models, Expert Systems with Applications, Volume 255, Part B, 124524, ISSN 0957-4174, https://doi.org/10.1016/j.eswa.2024.124524.

# M

Magsamen S. Your Brain on Art: The Case for Neuroaesthetics. Cerebrum. 2019 Jul1;2019:cer-07-19. PMID: 32206171; PMCID: PMC7075503.

Magsamen S; Ross, I. Your Brain on Art: How the Arts Transform Us (Random House, 2023, 304 pages)

Mastandrea, S., Fagioli, S., and Biasi, V. (2019). Art and psychological well-being: linking the brain to the aesthetic emotion. Front. Psychol. 10:739. doi: 10.3389/fpsyg.2019.00739

May, T (2022). Puppets made from pre-loved clothing strut the catwalk in new campaign for Vestiaire Collective. https://www.creativeboom.com/inspiration/long-live-fashion/

Morgan, P.E. (1997). THE DESIGN AND USE OF CAPACITY DEVELOPMENT INDICATORS.

Morgan, R.M. and Shelby D. Hunt (1994), "The Commitment-Trust Theory of Relationship Marketing," Journal of Marketing, 58

Muhammad Hamza Zakir, Syed Hammad Khan, Zahira Saeed, & Sajida. (2023). The Impact of Artificial Intelligence on Intellectual Property Rights. INTERNATIONAL JOURNAL OF HUMAN AND SOCIETY, 3(4), 312-319. Retrieved from http://ijhs.com.pk/index.php/IJHS/article/view/330

# N

Nishino, N., Okawa, Y., Oda, S. H., Ueda, K. (2007). An Experimental Analysis of Environmentally Conscious Decision-making for Sustainable Consumption. In: Takata, S.

Nizzoli, G (2024) Child Labour in the Fashion Industry: Is It Still a Thing? Project Cece

# O

O'Connor PJ, Hill A, Kaya M and Martin B (2019) The Measurement of Emotional Intelligence: A Critical Review of the Literature and Recommendations for Researchers and Practitioners. Front. Psychol. 10:1116. doi: 10.3389/fpsyg.2019.01116

# P

Pernias, P., Rampas, D., Richter, M. L., Pal, C. Aubreville, M. (2024). An Efficient Architecture for Large-Scale Text-to-Image Diffusion Models,The Twelfth International Conference on Learning Representations. https://openreview.net/forum?id=gU58d5QeGv

Patwary, S., Haque, M.A., Kharraz, J.A., Khanzada, N.K., Farid, M.U., Kumar, N.M. (2023). Apparel Consumer Behavior and Circular Economy: Towards a Decision-

Tree Framework for Mindful Clothing Consumption. Sustainability, 15, 656. https://doi.org/10.3390/su15010656

Paul Locher, Elizabeth Krupinski, Claudia Mello-Thoms, and Calvin Nodine. 2007. Visual interest in pictorial art during an aesthetic experience. Spatial vision 21 (02 2007), 55–77. https://doi.org/10.1163/156856807782753868

Pearce, M. T., Zaidel, D. W., Vartanian, O., Skov, M., Leder, H., Chatterjee, A., & Nadal, M. (2016). Neuroaesthetics: The Cognitive Neuroscience of Aesthetic Experience. Perspectives on Psychological Science, 11(2), 265–279. http://www.jstor.org/stable/26358612

Pelowski, M., Hur, Y.-J., Cotter, K. N., Ishizu, T., Christensen, A. P., Leder, H., & McManus, I. C. (2021). Quantifying the if, the when, and the what of the sublime: A survey and latent class analysis of incidence, emotions, and distinct varieties of personal sublime experiences. Psychology of Aesthetics, Creativity, and the Arts, 15(2), 216–240. https://doi.org/10.1037/aca0000273

Pepperell, R. (2011). Connecting Art and the Brain: An Artist's Perspective on Visual Indeterminacy. Frontiers in Human Neuroscience. 5. 84. 10.3389/fnhum.2011.00084.

Pham, H., Dang, H.P. & Nguyen-Viet, B. (2023). How can CSR in demarketing trigger brand advocacy and mindful consumption? Mediating roles of perceived corporate hypocrisy and brand credibility. Journal of Fashion Marketing and Management, Vol. 27 No. 5, pp. 851-869. https://doi.org/10.1108/JFMM-08-2022-0162

Primark Corporate. (2024) Fashion News: Rita Ora x Primark: Primark launches festival inspired collection with Rita Ora. https://corporate.primark.com/en-gb/a/news/fashion-news/primark-launches-festival-inspired-collection-with-rita-ora

Puppets Magic Studio (2022). VESTIAIRE COLLECTIVE: LONG LIVE FASHION https://www.puppetsmagic.co.uk/vestiaire-puppets.html

Puranik, V. (2023) Looking at colorful art helps our brain improve its well-being. Medicinal Media. https://www.medicinal-media.org/explore/colorful-art-helps-the-brain#:~:text=%E2%80%9CColorful%20artwork%20can%20trigger%20the,Khetan%2C%20certified%20expressive%20arts%20therapist.

# R

Red Dot Award (2023) Permanent Retail Installation - H&M Infinite Dreams. https://www.red-dot.org/project/hm-infinite-dreams-67001

Reed, S., Akata, Z., Yan, X., Logeswaran, L., Schiele, B., & Lee, H. (2016). Generative adversarial text to image synthesis. In International conference on machine learning(pp. 1060-1069). PMLR.

Rice, R., Rebich-Hespanha, S., Zhu, H. (2019)"Communicating about Climate Change Through Art and Science," in Climate Change, Media & Culture: Critical Issues in Global Environmental Communication (ed.) Juliet Pinto, Robert E. Jr. Gutsche, and Paola Prado (Bingley, UK: Emerald Publishing Limited, 129-154

Roca, P., Vázquez, C., Ondé, D. (2023) The Hedonic and Arousal Affect Scale (HAAS): A brief adjective checklist to assess affect states, Personality and Individual Differences, Volume 207, 112151, ISSN 0191-8869,https://doi.org/10.1016/j.paid.2023.112151.

# S

Sarovar, Kala & Rana, Nirbhay. (2023). SYNESTHESIA IN FASHION: EXPLORING THE CONVERGENCE OF VISUAL ART AND SENSORY PERCEPTION IN CLOTHING DESIGN. 26. 3235.

Schweizer C, Knorth EJ, Van Yperen TA, Spreen M. (2022) Exploring Change in Children's and Art Therapists' Behavior during 'Images of Self', an Art Therapy Program for Children Diagnosed with Autism Spectrum Disorders: A Repeated Case Study Design. Children. 9(7):1036. https://doi.org/10.3390/children9071036

Seock, Y.-K., Shin, J., & Yoon, Y. (2024). Embracing environmental sustainability consciousness as a catalyst for slow fashion adoption. Sustainable Development, 1–11. https://doi.org/10.1002/sd.2889

Serrao F, Chirico A, Gabbiadini A, Gallace A and Gaggioli A (2024) Enjoying art: an evolutionary perspective on the esthetic experience from emotion elicitors. Front. Psychol. 15:1341122. doi: 10.3389/fpsyg.2024.1341122

Sescousse, G., Caldú, X., Segura, B., and Dreher, J. C. (2013). Processing of primary and secondary rewards: a quantitative meta-analysis and review of human functional neuroimaging studies. Neurosci. Biobehav. Rev. 37, 681–696. doi: 10.1016/j.neubiorev.2013.02.002

Shao, S., Ribeiro, A., Fouladirad, S., Shrestha, C., Lee, K., Cameron, A. (2023). Adolescents' moral reasoning when honesty and loyalty collide. Review of Social Development. 10.1111/sode.12700.

Simonson, I. (2005) In Defense of Consciousness: The Role of Conscious and Unconscious Inputs in Consumer Choice, Journal of Consumer Psychology, Volume 15, Issue 3, Pages 211-217, ISSN 1057-7408, https://doi.org/10.1207/s15327663jcp1503_5.

Sohn, K., Jiang, L., Barber, J., Lee, K., Ruiz, N., Krishnan, D., & Castro Chin, D. (2024). Styledrop: Text-to-image synthesis of any style. Advances in Neural Information Processing Systems, 36.

Sommer, K., Klöckner, CA. (2019) "Does Activist Art Have the Capacity to Raise Awareness in Audiences? — A Study on Climate Change Art at the ArtCOP21 Event in Paris," Psychology of Aesthetics, Creativity, and the Arts, 2019, https://doi. org/10.1037/aca0000247

Sommer. L. et al., (2019) Pollution Pods: The Merging of Art and Psychology to Engage the Public in Climate Change, Global Environmental Change 59: 101992

Sung, E., Bae, S., Han, D., Kwon, O. (2021) Consumer engagement via interactive artificial intelligence and mixed reality. International Journal of Information Management, Volume 60, 102382, ISSN 0268-4012, https://doi.org/10.1016/j.ijinfomgt.2021.102382.

Sotiropoulos, M., Anagnostouli, M. (2021). Genes, brain dynamics and art: the genetic underpinnings of creativity in dancing, musicality and visual arts. Journal of Integrative Neuroscience. 20. 1095-1104. 10.31083/j.jin2004110.

Soule, C. & Reich, B. (2015). Less is more: is a green demarketing strategy sustainable? Journal of Marketing Management. 31. 1403-1427. 10.1080/0267257X.2015.1059874.

Stanislav Frolov, Tobias Hinz, Federico Raue, Jörn Hees, Andreas Dengel. (2021). Adversarial text-to-image synthesis: A review, Neural Networks, Volume 144, Pages 187-209, ISSN 0893-6080, https://doi.org/10.1016/j.neunet.2021.07.019.

Stein-Rachmil, S. (2024). The Impact of Fast Fashion Ecosystem Destruction: Can Sustainability Become Fashionable?. http://hdl.handle.net/20.500.12648/12203

Suttie, J (2023).What Art Does for Your Brain. Greater Good Magazine. https://greatergood.berkeley.edu/article/item/what_art_does_for_your_brain#:~:text=We%20are%20drawn%20to%20experiencing,needs%2C%20like%20food%20and%20sex.

Sykora, M., Elayan, S., Hodgkinson, I., Jackson, T., West, A. (2022) The power of emotions: Leveraging user generated content for customer experience management, Journal of Business Research, Volume 144, Pages 997-1006, ISSN 0148-2963,https://doi.org/10.1016/j.jbusres.2022.02.048.

Syrotkina, Z., Bankul, L., Bukhniieva, O.,Boychev, I., Gunko, N., & Chekhunina, A. (2022). The Artsas a Means of Developing Emotional Intelligence in theContext of Neuropedagogy. BRAIN. Broad Research inArtificial Intelligence and Neuroscience, 13(4), 306-320.https://doi.org/10.18662/brain/13.4/390

Szubielska, M., Imbir, K. & Szymańska, A. The influence of the physical context and knowledge of artworks on the aesthetic experience of interactive installations. Curr Psychol 40, 3702–3715 (2021). https://doi.org/10.1007/s12144-019-00322-w

# T

The Guardian. (2024) 'It's the industry's dirty secret': why fashion's oversupply problem is an environmental disaster.https://www.theguardian.com/fashion/2024/jan/18/its-the-industrys-dirty-secret-why-fashions-oversupply-problem-is-an-environmental-disaster

Tidler, S. (2023) Neuroaesthetics: How Art is Scientifically Proven to Help Brain Health. Art & Object.

Trupp, Mackenzie & Bignardi, Giacomo & Specker, Eva & Vessel, Edward & Pelowski, Matthew. (2023). Who benefits from online art viewing, and how: The role of pleasure, meaningfulness, and trait aesthetic responsiveness in computer-based art interventions for well-being. Computers in Human Behavior. 145. 107764. 10.1016/j.chb.2023.107764.

Tseng M-L, Chiu A S F, Tan R R and Siriban-Manalang A B 2013 Sustainable consumption and production for Asia: sustainability through green design and practice J. Clean. Prod. 40 1–5

# U

Umeda, Y. (eds) Advances in Life Cycle Engineering for Sustainable Manufacturing Businesses. Springer, London. https://doi.org/10.1007/978-1-84628-935-4_70

# V

Van Loo, E. (2016). The impact of sustainability labeling on consumers' food choices.

Váradi, J. (2022). A Review of the Literature on the Relationship of Music Education to the Development of Socio-Emotional Learning. Sage Open, 12(1). https://doi.org/10.1177/21582440211068501

Vessel, E. A., Starr, G. G., and Rubin, N. (2012). The brain on art: intense aesthetic experience activates the default mode network. Front. Hum. Neurosci. 6:66. doi: 10.3389/fnhum.2012.00066

Vivian Liu and Lydia B. Chilton. 2021. Design Guidelines for Prompt Engineering Text-to-Image Generative Models. arxiv:2109.06977 [cs.HC]

# W

Wang, P., Li, Y., Vasconcelos, N. (2021) Rethinking and improving the robustness of image style transfer. In: CVPR

WANG, T. (2024) How a Dessert Can Radically Alter Our Relationship to Data. https://www.ideo.com/journal/how-a-dessert-can-radically-alter-our-relationship-to-data?

Wassiliwizky, E., Koelsch, S., Wagner, V., Jacobsen, T., & Menninghaus, W. (2017). The emotional power of poetry: neural circuitry, psychophysiology and compositional principles. Social cognitive and affective neuroscience, 12(8), 1229–1240. https://doi.org/10.1093/scan/nsx069

Williams, L., Poehlman, T. (2017) Conceptualizing Consciousness in Consumer Research, Journal of Consumer Research, Volume 44, Issue 2, Pages 231–251, https://doi.org/10.1093/jcr/ucw043

Wren, B. (2022). Sustainable supply chain management in the fast fashion Industry: A comparative study of current efforts and best practices to address the climate crisis. https://doi.org/10.1016/j.clscn.2022.100032

# X

Xenakis, I., Arnellos, A. (2015). Aesthetics as an Emotional Activity That Facilitates Sense-Making: Towards an Enactive Approach to Aesthetic Experience. In: Scarinzi, A. (eds) Aesthetics and the Embodied Mind: Beyond Art Theory and the Cartesian Mind-Body Dichotomy. Contributions To Phenomenology, vol 73. Springer, Dordrecht. https://doi.org/10.1007/978-94-017-9379-7_15

# Y

Yao, E., & White, M. (2024). Oil painting color image enhancement recognition method based on artificial intelligence: applications of an AI model in environmental research. AQUA—Water Infrastructure, Ecosystems and Society, jws2024042.

Yılmaz, M., Yılmaz, U., and Demir Yılmaz, E. N. (2019). The relation between social learning and visual culture.

Yong, K., Junsong, H., Seppälä, L. (2024). A Service Blueprint Approach in Ship Building Activity Mapping. International Marine Design Conference. 10.59490/imdc.2024.827.

# Z

Zeng, Shaoting & Lyu, Xin & Kang, Jingfan. (2023). Research on Innovative Method of Human-Computer Collaborative Aesthetic Education Based on Hybrid of Neuroaesthetics and Shape Grammar. IEEE Access. PP. 1-1. 10.1109/ACCESS.2023.3300800.

Zentner, M., Grandjean, D., and Scherer, K. R. (2008). Emotions evoked by the sound of music: characterization, classification, and measurement. Emotion 8, 494–521.

Zhang, Y., Chuanlan, L. (2024). Unlocking the Potential of Artificial Intelligence in Fashion Design and E-Commerce Applications: The Case of Midjourney. Journal of Theoretical and Applied Electronic Commerce Research. 19. 654-670. 10.3390/jtaer19010035.

Zhang, Z., Zhang, Q., Xing, W., Li, G., Zhao, L., Sun, J., Lan, Z., Luan, J., Huang, Y., & Lin, H. (2024). ArtBank: Artistic Style Transfer with Pre-trained Diffusion Model and Implicit Style Prompt Bank. Proceedings of the AAAI Conference on Artificial Intelligence, 38(7), 7396-7404. https://doi.org/10.1609/aaai.v38i7.28570

**“To the future: where AI art in fast fashion stores turns impulsive purchases into mindful moments, inviting shoppers to pause and reflect!”**

– Alice Biolchini,
Master in Strategic Design