Digital Fashion Transformation. Defining Personalization and its Value in Digital Fashion Communication

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Submitted to the
Faculty of Communication, Culture and Society
Università della Svizzera italiana

for the degree of
Ph.D. in Communication Sciences

September 2022

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Abstract

Fashion is being impacted by a rapid digital transformation, which is not occurring in isolation, instead it is pervasive, disrupting its value chain at an unprecedented speed. This is raising compelling questions regarding the ways in which fashion is evolving.

In such context, personalization, driven by digital advances, occupies a dominating position, attracting the interest of both researchers and practitioners.

The predominant narrative is that personalization represents an opportunity to create value by building strong personal relationships between firms and consumers. However, personalization remains shadowed by unrefined definitions. Furthermore, while a stream of research supports its expected benefits, another stream questions its value, making personalization a controversial topic. Hence, although widely studied, its understanding remains a desideratum, lacking clarity regarding its construct and its value.

This cumulative thesis investigates how the digital transformation is impacting fashion and creating value through personalization. To this end, it adopts both quantitative and qualitative research methods, allowing to study *how* the digital transformation is impacting fashion, *what* is personalization, measure and identify *if*, *when*, *to what extent*, and *under which conditions* personalization provides value to fashion stakeholders.

The results are presented through eight studies, framed by the Online Communication Model (Cantoni and Tardini, 2006). The first three studies present the ways in which fashion is being impacted by the digital transformation (fifth element). In this digitally transforming fashion context, the focus is then narrowed to personalization. Three studies provide an in-depth understanding of personalization construct by developing a comprehensive definition and by showing how it is enacted by fashion firms through newsletters (pillars I and II), a crucial contribution to its theoretical advancement. Subsequently, through two studies it shows how personalization creates value by building a bridge between a firm (pillar III) and a consumer perspective (pillar IV). By not only measuring through experiments but also delving deep into the motivations of

personalization (in)effectiveness, this thesis makes contributions that transcend the latest digital advances.
The thesis findings provide also managerial implications by offering insights on how to develop and implement effective personalized communications that provide value to fashion stakeholders.

Keywords: fashion, digital transformation, digital fashion communication, personalization, perceived personalization, customization, personalization value

Acknowledgements

First of all, I would like to thank my supervisor, professor Lorenzo Cantoni. Your guidance has profoundly inspired me. It has been an absolute pleasure working together on this project – I'm grateful to have had the opportunity to share this learning journey with you.

This chapter of my life would have not been the same without the Digital Fashion Communication research team and all the experiences, trips, classes, coffee breaks we shared.

A special acknowledgement to dr. Nadzeya Kalbaska for your unwavering support since day one.

A thank you is also dedicated to the ITDxC colleagues – I'm grateful to have been part of such an amazing group.

To all of you who took time to actively participate in this research by sharing your knowledge, experience, and stories – it would have not been possible without you.

Mum, Dad and Paris – thank you for your unconditional support and for being patient listeners. This work is dedicated to you.

Baby Ivy – you brought so much joy during the writing process of this thesis. One day when you'll be able to read this work, may it be a reminder that you can achieve anything with hard work. You will hit some bumps along the way but the journey will be worth it.

To my family – Marie, Clinton, Carole, Stefano, Reece, Nicky, Miles – for encouraging me since day one.

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List of Abbreviations

AI – Artificial intelligence

AR – Augmented reality

CMC – Computer mediated communication

ELM – Elaboration likelihood model

HCI – Human computer interaction

ICTs – Information and communication technologies

IoT – Internet of things

IR – Industrial revolution

KPI – Key performance indicator

OCM – Online communication model

SOR – Stimulus organism response

VR – Virtual reality

Chapter 1. Introduction

This cumulative Ph.D. thesis explores fashion's digital transformation with a focus on personalization.

The Online Communication Model (OCM) by Cantoni and Tardini (2006) is adopted to frame this thesis. The model is formed by four main pillars and a fifth element: contents and services offered (pillar I), accessibility tools and outlets necessary to provide the elements of the first pillar (pillar II), people managing the resources (pillar III), and people accessing the contents and services (pillar IV). The information context with its players represents the fifth element.

The digital fashion context represents the starting point of this thesis (fifth element). The fashion industry is experiencing a rapid digital disruption that is taking place across its value chain. Understanding the ways in which such digital transformation is impacting fashion and offering value to its stakeholders is becoming a priority for both academics and practitioners. This thesis addresses the ways in which it is affecting fashion both from an academic perspective, in order to identify the state of the art of digital fashion research and from an industry perspective, with the aim of capturing the ways in which the digital skills and competences required by the fashion industry are evolving.

In this digitally transforming fashion context, the thesis narrows the focus to personalization, a widely interesting but also extremely challenging topic. It is highly interesting because due to digital advances potentially every object, both tangible ones, such as garments and intangible ones, such as the contents and the channels through which messages are delivered, can be personalized (Pillars I and II) by fashion firms (pillar III) for each customer (pillar IV). However, capturing the meaning of personalization and its value for fashion stakeholders in the fast-evolving digital information context can be challenging.

By delving deep into these four pillars in the digital fashion context, this thesis advances the understanding of how to create value through personalization.

The remaining of this chapter provides details on the thesis' structure.

1.2 Thesis structural overview

This section provides an overview of the thesis' chapters and their content.

Chapter 2 is dedicated to the presentation of the three realms of this thesis: digital communication, digital fashion, and personalization. By unveiling how these overlap and interplay with each other, this chapter argues the relevancy of their intersection: personalization in digital fashion communication.

Chapter 3 specifies the conceptual and theoretical grounds on which this thesis is built: interpersonal and mass communication (section 3.1), segmentation and relationship marketing (section 3.2), persuasion and perception (section 3.3).

In chapter 4 the research gaps of this thesis are presented (section 4.1). Then, the overall goal and three overreaching research questions, which enable to address the gaps, are articulated (section 4.2). Section 4.3 details the methods adopted to reach the thesis goal. Lastly, the studies that form this cumulative thesis are summarized, while highlighting how each one of them contributes to the overall goal (section 4.4).

Chapter 5 presents the results through the papers that form this thesis.
The studies are organized in three sections, reflecting the three overreaching research questions. Section 5.1 includes three articles regarding fashion's digital transformation, section 5.2 three articles on personalization and its definition, and section 5.3 two articles on personalization's value.

Chapter 6 concludes this thesis. It synthesizes, connects, and discusses the theoretical (section 6.1) and managerial (section 6.2) implications of this cumulative work.
Finally, its overall limitations are addressed whilst detailing suggestions for future research (section 6.3).

Chapter 2. Study realms and relevance

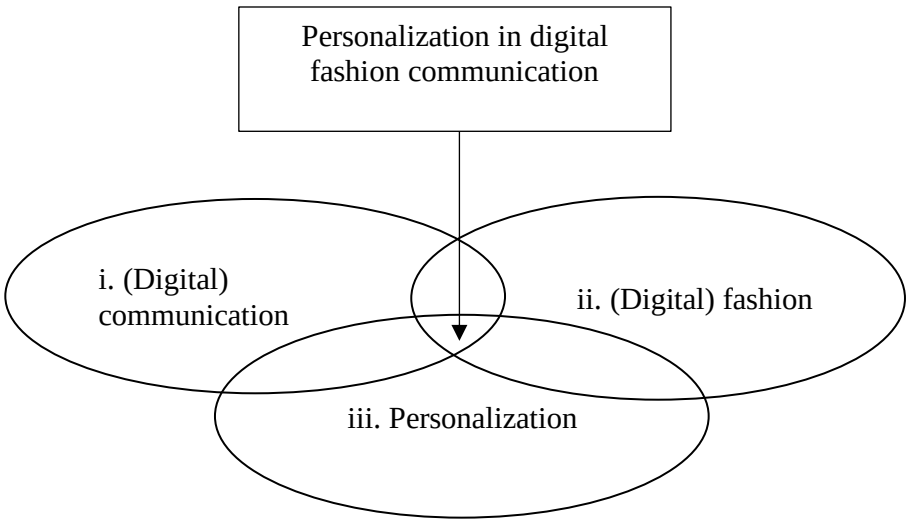
In order to provide a comprehensive background to this thesis, it is necessary to introduce three main elements: (i) (digital) communication, (ii) (digital) fashion, and (iii) personalization. This chapter highlights their interdependence and how, from their interplay, "personalization in digital fashion communication" emerges as a crucial and compelling research topic (figure 1).

The overlap between the three elements is addressed as follows: section 2.1 presents the relevancy of studying (iii) personalization in (i) (digital) communication. Through an excursus on the development of the communication channels that enable new ways to send and receive messages, it highlights how personalization, once a characteristic of solely face-to-face interactions, has become pervasive in computer interactions.

Section 2.2 emphasizes the long lasting "coupling" of (ii) (digital) fashion and (i) (digital) communication. To do so, it introduces the concept of fashion and the meaning with which it is adopted in this thesis. Furthermore, it discusses how the digital transformation is impacting the whole value chain of the fashion industry, opening-up both opportunities and challenges and raising the interest in digital fashion communication.

The chapter concludes (section 2.3) by making the case of (ii) (digital) fashion as an extremely relevant realm to study (iii) personalization, highlighting the interplay of fashion and personalization. It argues that personalization has played a central role in fashion for centuries by showing how its meaning has evolved from the first to the fourth industrial revolution.

Figure 1. Study realms



2.1 (Digital) communication & personalization

Communication refers to "the act or process of information transmission; the giving or taking of meaning; the sharing of information, ideas, impressions or emotions; the process of reception and response; the exertion of influence; any form of interaction" (McQuail, 2010 p. 15).

In Latin language "communicare" (cum = with and munis = duty) was used to express the act of sharing a duty or a gift with someone. As defined by Eddo Rigotti in Cantoni and Di Blas (2006 p. XXII) communication is "an exchange of goods". In its modern use, "communication" is adopted restricted to the sharing of a specific good, that of meanings through signs. In its most simple form, communication involves three elements: a message sender, a message receiver, and a message that is communicated (Cantoni and Di Blas, 2006). This model has been extended to include further elements, for example, Jakobson (1960) identifies six factors of verbal communication: addresser, addressee, message, context, code, and contact. The addresser sends the message and the addressee receives it. The context refers to the environment in which the message is sent, the code is the common means through which the addresser and the addressee communicate, and the contact is the channel through which they communicate.

One way largely utilized to approach communication research is by focusing on the channel adopted to deliver the message, as mediums can shape the communication itself and influence the manner in which individuals express themselves (Cantoni and Di Blas, 2006). As provocatively stated by McLuhan (1964 p. 23) "the medium is the message".

Communication mediums developed slowly until the fifteenth century, a turning point for communication with the invention of the print. Since then, communication channels have witnessed a rapid evolution. The advent of electronic mediums such as the radio, cinema, and television from the mid-nineteenth century brought important changes to communication, impacting the relationship between the message sender and the receiver (Cantoni and Di Blas, 2006). Such channels enabled to reach an audience formed by a large, anonymous, and unknow group of individuals: a "mass" who consumes content available to everyone. In the 1930s, from the notion of the audience as a mass, the term "mass communication" started being used to refer to communications that took place through the new mass media: the message sender has no knowledge of the audience and develops a standard and largely impersonal message. Furthermore, the message sender has usually more authority than the receiver and there is no interaction between the two, resulting in a one-directional and asymmetrical communication process (Cantoni and Di Blas, 2006; McQuail, 2010; Landert, 2014).

Mass communication has been largely presented in contrast to interpersonal face-to-face communication, a two-way interaction between few individuals who have some knowledge of one another (McQuail, 2010; O'Sullivan and Carr, 2018). The differences between mass and interpersonal found explanations in the channels utilized to deliver a message, as mass communication channels enabled one-way and impersonal communications, whereas face-to-face communication allowed two-way and personal ones.

In the 1960s, technological innovations such as the local cabling of the television and the use of satellites started changing mass communication. In the 1980s/1990s the changes were accelerated by the advent of the Internet, as it enabled to reach a mass audience through a two-way and interactive communication under limited institutional control and diverse in content (McQuail, 2010; Tardini and Cantoni, 2015). The Internet created an

overlap between the characteristics utilized to distinguish between mass and interpersonal communication, resulting in a stream of scholars questioning the assumption that the type of communication is determined by the medium through which the message is delivered (McQuail, 2010; O'Sullivan and Carr, 2018).

In fact, early computer mediated communication (CMC) studies interested in capturing the shift of communication from face-to-face to mediated settings considered technology as an obstacle to communication quality due to the lack of non-verbal cues and the distance between the message sender and receiver. Additionally, they argued that CMC could only be useful for task oriented, impersonal, and unidirectional activities (Sundar, 2020).

Walther (1996 p. 17) suggests that computer technologies enable a personal interaction which is stronger than face-to-face interactions, phenomenon which he refers to as "hyper-personal communication". To justify this position, he discusses how CMC has undergone three phases: (i) impersonal, (ii) interpersonal, and (iii) hyper-personal. On this line, scholars are dismissing the view that technology depersonalizes communication, increasingly suggesting that mediated interactions can be as personal, if not more, as those that occur face-to-face: the message receiver forms an idealized perception of the message sender as there is no physical contact; the message sender creates an optimized self-presentation due to the high control over the communication cues as the interaction often occurs asynchronously (Lim et al., 2022; Rust, 2020; Walther, 1996).

As online communications are becoming increasingly interactive due to technological advances, scholars' focus is shifting to understanding how humans interact with computer technologies, area of research called human computer interaction (HCI) (Sundar, 2020). Communication technologies are no longer passive tools; instead, they are becoming increasingly able to mimic human intelligence (Kang and Kim, 2022). In this scenario, an important technology advancement is represented by artificial intelligence (AI), which can be described as "step-by-step procedures for solving problems and making decisions using software-driven systems" (Dehnert and Mongeau, 2022 p. 3). AI and algorithms are radically changing digital communication as non-human data-driven technologies are utilized to deliver information and interact with individuals (Kim and Duhachek, 2020; Kruikemeier et al., 2021; Seele et al., 2021). In fact, it is expected that a high portion of

human conversations with computers will be increasingly generated by AI systems (BoF and McKinsey & Company, 2022).

The power of AI systems for personalization lays in the ability to learn on how to learn by constantly processing new information collected from users (Cao, 2021). They are "intelligent" as they utilize the data collected to provide an output in the form of information. In fact, they are considered to somehow surpass human intelligence as, by leveraging on big data, they can adapt communications in real time (Verma et al., 2020). Hence, AI systems are enabling to recreate online the immediacy and the interactivity typical of face-to-face communications (Ameen et al., 2021). For example, AI provides the possibility to humanize computer interactions through conversational agents, which are systems that emulate human conversations. These can appear without an embodiment through chatbots or they can be embodied through avatars and robots (Lim et al., 2022). Individuals can interact with online agents, ask for information and suggestions, and receive recommendations in real time (Lim et al., 2022). The ability of AI to simulate human functions can be exceptional for businesses to identify their customers, help with segmentation, and provide solutions to personally interact with each individual and promptly respond to their needs (Verma et al., 2020). In fact, these systems are becoming so powerful in personalizing the communication that sometimes individuals are not aware that they are interacting with a computer (Hermann, 2022; Sundar, 2020).

As it clearly emerges from this introduction, studying personalization in communication as a result of ICTs advances that are taking place represents a pressing and compelling research topic.

The subsequent section presents the overlap of (digital) fashion and (digital) communication.

2.2 (Digital) fashion & (digital) communication

This section discusses the relevancy of conducting digital communication research in the fashion field with the aim of highlighting their long "happy coupling".

Firstly, it introduces the concept of "fashion" and the ways in which it is defined in the literature and in this thesis. Secondly, it discusses how digital advances are transforming every aspect of the fashion industry and as a result also its meaning, giving rise to "digital fashion".

2.2.1 What is "Fashion"?

Fashion, from the Latin "factio, facere" "making or doing" and from the French "façon" "way, appearance, design, beauty" refers to the action of giving shape to and doing something, a habitual practice, and the latest style (Online etymology dictionary, 2022; Barnard, 1996).

In its basic form, fashion has a fundamental functional task of covering our bodies, for example for warmth and for modesty. Beyond this practical task, fashion also conveys symbolic meanings, it is a way for individuals to express their identity, feelings, social status, and gender preferences (Barnard, 1996; Mair, 2018; Cantoni et al., 2020).

Until rather recently, the study of "fashion" attracted limited academic attention as only few scholars recognized its value as a research field (Blumer, 1969, Andò and Campagna, 2022). Nonetheless, from the early studies of scholars who considered fashion worthy of attention beyond its frivolousness, it soon emerged as a multifaceted concept.

Simmel (1957) conceptualized fashion as a form of class differentiation, suggesting its relevance derives from the ability of satisfying the needs of human beings: on one hand, the need to feel part of a community and on the other hand, the need to be unique and express personal taste and identity. According to Simmel (1957 p. 541) "fashion is a form of imitation and of social equalization, but, paradoxically, in changing it differentiates one time from another and one social stratum from another. It unites the class and segregates them from others". Fashion is thus a way to satisfy an individual's need to conform but also that of being different.

Fashion has also been approached and analysed as a form of communication (Alison, 1981; Davis, 1994; Barnard, 1996). Alison (1981) in her book presents fashion as a language that has the ability to make statements. Similarly to speech through which each individual expresses him/herself by adopting a more or less extensive vocabulary, each

individual reveals him/herself by selecting and choosing fashion, whose vocabulary is made of items such as clothing, hairstyle, make-up, and accessories. Also Davis (1994) sees fashion as a language, yet he argues that it is an ambiguous language, which does not follow the same code of cryptography as it does not conform to the same rules of speech and writing. Three main features characterize the clothing code: (i) context-dependency, as the meaning of a piece of fashion derives from the individual who wears the fashion and the place and context in which it is worn, (ii) high variability in its meaning, as what is expressed and understood through fashion varies between different social strata and cultures, and (iii) undercoding, as compared to other forms of communication, such as speech and writing, the meanings attached to fashion are often ambiguous (Davis, 1994).

As a form of non-verbal communication, fashion is a complex form of expression (Barnard, 1996). For example, the act of purchasing clothes is shown to be a way utilized by individuals to improve their moods and feel better. It can be utilized to indicate the beginning and the end of a ritual, for example by wearing black clothes to mourn a loss. It can also be utilized to indicate social status, role, and economic worth and also interpret those of others (Barnard, 1996).

Davis (1994) and Barnard (1996) highlight that, although fashion is a form of communication, it should not be reduced to the process of delivering and receiving messages in which meanings pre-exist the process of sending them. Instead, its meanings are generated from individuals' interaction with messages, leaving fashion open to many interpretations. As such, fashion is a cultural phenomenon (Andò and Campagna, 2022); it is not only a way to communicate feelings or emotions, but also a way to communicate and produce values and beliefs, making fashion a building part of individuals and their identities, not only a reflection of them. In fact, fashion, especially its production system, was considered to be only related to the Western world, yet such assumption has been rejected as fashion in general is analysed as a universal process highly related to different cultures and societies (Tortora, 2015).

Fashion as a social phenomenon cannot be identified across all times mainly because there are not enough materials to determine what they used to wear in the prehistoric period. However, it is highly likely that garments have always been utilized at least for functional

reasons, such as for protection indicating its universal and timeless importance (Barnard, 1996; Tortora, 2015).

An intrinsic characteristic of fashion is that of change (Tortora, 2015). The importance of change in fashion is reflected in the evolution of its understanding. For example, in the fifteenth century fashion was a symbol of class status (Tortora, 2015). Due to the disappearance of identity as a representation of one's social status, it has become crucial for individuals to forge their personal identity and differentiate themselves, a process in which fashion takes a central role (Tortora, 2015; Negrin, 2008). In fact, in its recent understanding, fashion, which has become increasingly democratic, cannot be separated from personal identity, as "what we wear is an outward display of ourself and our identity" (Mair, 2018 p. 55).

This idea of change is at the heart of the definition of fashion from a social science perspective, which defines it as "a type of human behaviour in which a large number of individuals accept the same form of behaviour for a short period of time and then change that behaviour" (Tortora, 2015 p. 2). Such definition of fashion can refer to many areas, such as dress, food, architecture, and cars. The focus of this thesis is on fashion as "dress". Indeed, fashion is sometimes utilized as a synonym of "dress", "clothing", "style", and "adornment". In this thesis, Tortora's (2015 p. 2) definition of dress as "anything that defines or modifies the human body" is adopted to refer to all those items such as garments, headwear, footwear, make-up, handbags, and jewellery.

As further discussed in the subsequent section, the understanding of fashion as change is ever so relevant in the twenty-first century as the fashion industry is experiencing a digital transformation, giving rise to the so-called "digital fashion" (Noris et al., 2021).

2.2.2 Digital fashion

This section introduces the concept of "digital fashion" in order to show how the "happy coupling" between fashion and communication remains relevant also in the digital context. Digital advances are inherently impacting fashion and bringing changes that are far from superficial, as they are transforming its notion on many levels, such as the way in which

it is designed, produced, communicated, advertised, marketed, utilized, and disposed (Cantoni et al., 2020; Kalbaska et al., 2019).
The aim of this section is not to provide a comprehensive overview of the impacts the digital transformation is having on the fashion industry (for a detailed analysis and discussion see chapter 5 – sections 5.1.1, 5.1.2, 5.1.3). Instead, it wishes to highlight the interplay and relevance of fashion and communication in the digital context.

Previous to the digital transformation, retail structures were relatively stable and organized in entities involved in the manufacture of goods and services, wholesalers and retailers in charge of the distribution, and consumers who were "passive" recipients of the products and services. The digital disruption is dismantling this rigid structure and affecting the whole value chain: the ways in which manufacturers source materials and produce goods, the ways in which retailers market and communicate products, and the ways in which customers purchase, consume, and experience products and services are changing (Grewal et al., 2017; Teunissen and Bertola, 2018; Andò et al., 2019; Reinartz et al., 2019).
The fashion industry is fully embracing the digital transformation and experiencing a growing adoption of technology at each point of its value chain as it increasingly recognizes it as a crucial source of value creation in order to compete and thrive in such a complex market (Bonetti et al., 2019; Voyer and Ko, 2021).
Reinartz et al. (2019) identify five key sources of value creation derived from the digital transformation of the fashion industry: automation, individualization, ambient embeddedness, interaction, transparency and control. Automation refers to the self-sufficiency of many technologies that can operate without the need of human input, such as chatbots and message reminders, which create value through convenience and monetary savings. A substantial source of value creation derives from individualization as digital advances enable to deliver personally relevant information. Furthermore, digital advances provide value through ambient embeddedness, which refers to the different ways in which digital technologies connect individuals thanks to a variety of devices, channels, and platforms. This is also enabling to bridge and enhance customers' online and offline experiences. In fact, physical stores are not exempt from the digital transformation as

brick-and-mortar stores are becoming “smart” (Lim et al., 2022; Verma et al., 2020). Immersive in-store technologies such as augmented reality (AR) and virtual reality (VR) are increasingly utilized in order to combine the advantages of the “real” physical world and the virtual world in smart shopping malls offering multisensorial experiences that were previously not possible (Ameen et al., 2022; Jung et al., 2021; Bonetti et al., 2019; Guercini et al., 2018).

Additionally, these advances allow firms and customers to interact in novel ways, offering value through experiences, relevance, and convenience. In fact, the ways in which fashion products and information can be distributed, marketed, and communicated have greatly advanced since the first fashion websites emerged in the 1990s, transitioning from basic ecommerce and web pages to social media and user generated content and to the more recent overlap of physical and digital spaces in the metaverse (Rocamora, 2015; BoF and McKinsey & Company, 2022).

Lastly, consumers are empowered through transparency and control as they have many new ways to access information for effective decision-making. In fact, consumers are no longer isolated and unaware, instead they are connected and informed, playing an active role in shaping digital fashion (Prahalad and Ramaswamy, 2004; Bonetti et al., 2019; Andò, 2020; Helm et al., 2020).

Although many sources of value creation have been identified, the fashion sector is struggling to develop a digital infrastructure that integrates individuals, objects, services, data, and machines and reap the benefits of the digital transformation (Teunissen and Bertola, 2018). Indeed, the Covid19 pandemic, which brought to surface many weaknesses of the fashion industry, has accelerated its digital transformation as firms were forced to take a leap forward and abandon the passive approach to digitalization in order to survive in such a cut-throat market (Sirimal Silva and Bonetti, 2021). However, such upheaval has not yet been sufficient to create a digitally integrated industry.

So far, the importance of researching personalization in digital communication has been introduced (section 2.1). Then, it was presented how the interplay of (digital) fashion and communication represents an interesting area of study (section 2.2).

The subsequent section (2.3) highlights the interplay of personalization and fashion by showing how personalization has long been and continues to be the protagonist of the fashion industry.

2.3 Personalization & (digital) fashion

This section discusses the central role of personalization in the fashion field.
Through an excursus on the four industrial revolutions, it presents how personalization has evolved through centuries of technological developments to reach its current status.
It is important to note that this section is not meant to provide a comprehensive overview of the technological developments that occurred during each revolution. Instead, it focuses on selected advancements relevant for introducing personalization in fashion with four aims: firstly, it highlights how personalization, although it is a current key trend (BoF and McKinsey & Company, 2022), has long had a leading presence in the fashion industry. Secondly, it helps to understand why it is important to study (digital) fashion personalization from a social science perspective. Thirdly, such excursus provides a background to the thesis research questions, which will be presented in section 4.2. Particularly, it sets the scene for the crucial issue of defining personalization in fashion and it lays the foundations for the personalization / customization debate. Due to its long-lasting relevance, the concept of personalization / customization has taken on various meanings that reflect its evolution through the industrial revolutions (IR): (IR1) manual tailored made production, (IR2) mass production typical of the ready to wear fashion, (IR3) mass customization, and (IR4) hyper-personalization supported by ICTs advances. Finally, by the end of this section it will be clear how and why the three main areas of this thesis – digital communication, personalization, and fashion – represent a fruitful area of research.

2.3.1 From manual to machine production: tailor made

The first industrial revolution (IR1) started in Great Britain around 1770s marking the transition from a fully manual production to a machine production. For centuries, the production had been based on craftsmen and artisans who had the knowledge and skills to

craft products by hand. The IR1 replaced the notion of hand production with that of mechanization, which entailed the use of machines, steam and waterpower, and iron production to manufacture products (Pine II, 1999; Jenkins, 2014; Wang et al., 2017).

The textile industry represented the leading sector of the IR1 and one of the first to employ novel production methods. A key and remarkable invention for the textile industry in Great Britain was the mechanized loom, which automated an important part of the weaving process. Its invention is credited to Edmund Catwright in 1785 and it was later improved and made commercially viable by William Horrock in 1802 (Allen, 2018).

Meanwhile in France, Joseph-Marie Jacquard was also working on improving the loom. He was driven by the high stakes such innovation would mean for France to show the superiority of French innovations in its rivalry with Great Britain. Jacquard's intent was that of speeding up the work of the silk-weavers and enable them to create decorated silk fabrics with different designs. This objective could have been achieved by developing various machines each one dedicated to a unique design, yet it would have been expensive and unpractical. Thus, Jacquard knew that he had to develop one single loom that contained the instructions to create multiple designs in order to make the process more efficient. From this idea, he built an automatic loom, the Jacquard loom, which could rapidly create any decorative design through interchangeable punch cards (Essinger, 2004).

The importance and implications of such invention extend beyond the textile industry. In fact, it is considered the precursor of the computer and of the information age as the principle on which the loom was built offered a method to automate a process, becoming a major source of inspiration for inventions beyond the textile industry. For example, it was a source of inspiration for Charles Babbage who invented the first calculating machine that could be programmed (1830) and also for Herman Hollerith who invented a machine that could be described as a loom able to weave information instead of silk. Hollerith's invention was driven by the challenge of handling Census information. He believed this challenge could be solved through mechanical means and the newest technology, electricity, leading around the 1890s to the invention of the tabulators, machines able to automatically count and sort a large number of cards. The Hollerith's Tabulating Machine

Company laid the foundations of IBM and is therefore considered a precursor of the information technology revolution (Essinger, 2004).

Another important invention that enabled the transition from a fully manual to machine production is the sewing machine due to the economic benefits it provided for clothes production. The first sewing machines were patented as early as the 1840s and later improved by Isaac Singer in 1951. It is with the American Civil War (1861-1865) and the need of uniforms for soldiers that the sewing machine started to gain attraction and became widespread, representing a first step towards mass production, a turning point for the fashion industry (Tortora, 2015), as further discussed in the following section.

2.3.2 Mass production: ready to wear fashion

The second industrial revolution (IR2) started around 1870s. It marks the period of mass production characterized by low-cost and standardized products that could be afforded by a wide customer base. Henry Ford is credited with having introduced mass production, the so-called "Fordism" to refer to the production of high amounts of products at a low cost. Mass production came at the cost of differentiation, in the words of Henry Ford "Any customer can have a car painted any colour that he wants so long as it is black" (Wang et al., 2017 p. 312).

The shift from tailor made to mass production is a result of various factors, including technological advances and societal, political, cultural, and behavioural changes.

In the early twentieth century, mass manufacture systems started to replace bespoke and tailoring services (Waddell, 2004). Traditionally, the advent of mass production in the fashion industry is presented as a result of the invention of the sewing machine. However, scholars increasingly agree that the transition from tailor made to mass produced fashion is to be identified with the introduction of ready to wear fashion characterized by standard sizing. The first ready-made clothes predate the introduction of the sewing machine and can be traced back to the end of the seventeenth century when the production of military clothing began. At the time, tailors were already organizing their labour by getting less-skilled workers to work on the easy part of the garments and reaching out to domestic workers (Green, 1994; Godley, 1997).

Wars played an important role in the development of mass production. The need of military and civilian uniforms led to the creation of patterns that reflected body shapes, representing the first attempt to standardize sizes. They imposed the need to conform also from a style perspective, eliminating any form of creativity and self-sufficiency in fashion, which could be provided by mass produced products. The demand for ready-made garments beyond functional military clothing was driven by early entrepreneurs who, recognizing the need for cheap and well-cut items, started selling second-hand clothes. By the 1840s, they began investing in retail outlets, selling pre-assembled garments, and employing tailors and seamstresses. The wide adoption of sewing machines in the 1860s supported the development and expansion of the ready-to-wear fashion at a larger scale. While initially limited to menswear, it later extended to womenswear around 1865 when women started entering the workforce leaving them with limited time for sewing (Godley, 1997; Green, 1994; Tortora, 2015).

The decline of the couture system in the 1960s reflects cultural and societal changes. Symbolically it started in London, when young fashion students, designers, and movements such as mods and rockers started rejecting the standards and traditions established by the elite of society, including the dress code (Waddell, 2014). The term "couture" from French sewing/stitching is a form of manufacturing where the garment is produced to the client's specific measurements (Waddell, 2004). By the 1970s, as young women who could afford haute couture garments started to consider the whole fitting process too time consuming, ready-to-wear fashion became popular as it enabled the possibility to try on many items and choose among them (Waddell, 2004).

The changing fashion world led to a division of labour between high skilled tailors who defended their expertise against ready-to-wear workers, creating a dichotomy between couture and ready-to-wear (Green, 1994). With the rise of production for the masses, the debate of art (couture) over clothing (ready-to-wear) extended from a taste to a commercial competition as cheaper products became essential for sales. For example, the cheaper prices offered by Germany made the French industry realize that elegance was no longer sufficient for sales. As described by Green (1994 p. 740) "the weapons of each country in the commercial battlefield are price and style".

The ready-to-wear revolution was different in countries and resulted in competing debates. For example, the French emphasized fashion as art, whereas Americans embraced the democratization of fashion thanks to new production techniques (Green, 1994). This competition can also be explained in cultural terms through the image of women, who embodied different country values: French women personified elegance and good taste, whereas German and American women were described by the French as lacking taste and individualism (Green, 1994).

A similar debate emerged in Italy (Paris, 2021). At the end of the World War II (April 1945) the fashion and textile sectors faced a challenging situation and needed to rethink the production system and invest in new machinery. It is in this year that the Italian Clothing Industry Association (AIIA) was created in order to safeguard the interests of the ready-to-wear sector. In the 1950s, the Italian fashion industry was divided in two main supply systems: the made to measure high fashion and the ready-to-wear mass production fashion. In the 1960s this rigid division started to change as consumers with growing purchasing power started also valuing the social status of fashion and not only the quality-price relationship of products. This created an increase in demand and a change in the cultural dynamics of fashion as new generations no longer sought their role model in high fashion, which they considered outdated (Paris, 2021).

This transition to "standard fashion", which meant the democratisation of fashion as the industry abandoned its attention to style to focus on product convenience, is evident also in the communication strategy (Caffaro, 2017). Ready-made fashion was accompanied by a massive media communication, creating the concept of "popularity" and boosting the demand of ready-to-wear garments.

It is in 1961 when the Italian Industrial Association of Clothing released the system of women sizing that a new "ready fashion" started to be portrayed and represented in mass communication through the "normalised" body of celebrities, who became icons of style. Thus, it is evident how the production revolution of fashion is connected to the socio-cultural situation in Italy (Caffaro, 2017).

As it will emerge in the subsequent section, the early twenty-first century saw the comeback of custom-made design supported by technological advances.

2.3.3 Mass customization production

The third industrial revolution (IR3) also referred to as the digital or information revolution is grounded in information communication advances. It started in the 1970s in the United States (California, Silicon Valley) from a group of highly skilled engineers and scientists who came together to work on and develop new technologies (Castells, 1996). The digital revolution is traditionally presented as a consequence of the economic and energy crisis of the mid 1970s. Castells (1996 p. 59) recognizes the overlap in dates of the economic crisis and the beginning of the information revolution, yet he argues that such overlap is a coincidence as the "technological fix" would have occurred too quickly to remedy the crisis. Instead, he suggests that only at a later stage, around the 1980s, the information revolution can be considered to have had a central role in shaping the world's socio-economic system.

Similarly to the IR1 and IR2, the IR3 represented a key turning point for society. The element that differentiated the third revolution from the previous two was the focus on information and communication technologies, as information became the most important raw material. Castells (1996) identifies five characteristics of the information technology paradigm: (i) information is the most important raw material, (ii) new technologies have a pervasive effect on all human activities, (iii) new information technologies are networked, (iv) the new paradigm is characterized by change, (v) new and old technologies converge to create an integrated system.

Information technology and manufacturing advances enabled the development of production systems that could produce products of high variety at a cost similar to that of mass production and satisfy consumers' need of differentiation. Firms were already able to narrow their market to consumers in groups with similar characteristics through custom production, yet it was an expensive process as seen in the production system of the IR1. Whereas, mass production, despite its cost advantage, could not satisfy consumers' growing demand for differentiation. The digital revolution permitted to overcome such challenges through a new production system: mass customization, an oxymoron that blends the contrasting ideas of mass production and custom made. It represented an unprecedented opportunity to satisfy consumers' demand for differentiation and compete

in an increasingly competitive and globalized world by delivering custom made products in a cost effective and timely manner (Da Silveira et al., 2001; Pitta, 1998; Pine II, 1999; Wang et al., 2018).

Attracted by the promises of mass customization, many firms in the late 1980s invested in mass customization solutions and production systems. Yet, many of them initially suffered losses as they undervalued the challenges implied in mass customization, the improvements necessary across the whole company, from the supply chain to the skills of the workers (Pine II et al., 1993).

While the technology advancements of IR1 and IR2 were mainly focused on the production of physical goods, the information revolution extended it also to the service industry. As it will be discussed in section 3.2, it is around the 1980s that the concepts of relationship and one-to-one marketing started to emerge as a response to increased market competition, resulting in a shift of focus from acquiring new customers to building lasting relationships with existing ones.

2.3.4 Personalization

We are currently experiencing the fourth industrial revolution (IR4), whose origins trace back to the need to stimulate economic growth after the financial crisis of 2008/2009. Symbolically, the IR4 started in the year 2011 when the German Federal Government announced the need to advance the manufacturing system supported by technological advances (Şener et al., 2018). Since then, the concept of IR4 has evolved and expanded worldwide. What differentiates the IR4 from the other revolutions is the speed at which it is taking place and the extent to which it is profoundly impacting society (Madsen, 2019). Broadly, the IR4 can be considered as a vision of business and society centred on digital innovations. According to Teunissen and Bertola (2018 p. 353), the IR4 in fashion has been traditionally viewed from a manufacturing-centred vision as the convergence of physical and digital in “smart factory”. However, they argue that such view is restrictive and that it should be extended beyond “smart factories” to “smart networks”, and “smart products” as many innovations are transforming the whole fashion industry, beyond its

manufacturing system anticipated in the IR3: a system where data is gathered and shared at all levels and at all stages of the value chain of a company (Arromba et al., 2021).

Data is the protagonist of the IR4, the driving force of technology advances such as IoT, VR, AI, cyber-physical systems, radio frequency identification technology, and cloud computing (Wang et al., 2018; Verma et al., 2020), which provide remarkable opportunities for personalization across the fashion value chain. These new and improved solutions build on the mass customization systems of the IR3 by enabling to not only produce garments that reflect consumers' demands at a reasonable price but also allow to develop more efficient, lean, transparent, and sustainable systems (Jin and Shin, 2021).

User-friendly computer aided design toolkits such as product configurators transfer directly to consumers the ability to configure their fashion items by choosing from a combination of different options such as colours, patterns, materials, fit, and sizes, overcoming the traditional mass customization process in which the manufactures have to understand the needs of consumers and then develop products (de Bellis et al., 2013; von Hippel and Katz, 2002).

Digital advances extend personalization solutions beyond tangible products to the interaction between firms and customers. As anticipated in section 2.1.1, communication has been widely impacted by digital advances offering many opportunities for personalizing the interaction, resulting in new ways to create value for fashion stakeholders as potentially every aspect of the communication process can be personalized. Technology advances enable unprecedented solutions to replace the one-to-one face interactions typical of brick-and-mortar shopping with non-human interactions (Kang and Kim, 2022). For example, the messages delivered can address the recipients by their first name as if they were greeted by a sales assistant in the physical store (see e.g., Yu and Cude, 2009; Wattal et al., 2012). They enable to capture consumers' likes, dislikes, preferences, needs, behaviour and react in real-time by delivering relevant content and filtering out irrelevant information. This is possible thanks to AI systems, such as recommender systems, which collect and utilize data to provide an output in the form of information that can be useful for both consumers and firms (Nguyen and Ricci, 2018; Hermann, 2022). For consumers, the recommender systems alleviate information

processing and choice overload by processing the online information for them. By doing so, they support their decision-making and offer guidance on what to purchase. Whereas for firms, the systems provide control over what information to communicate to each individual and help predict their preferences and needs (Nguyen and Ricci, 2018; Trzebinski and Marciniak, 2022; O'Shaughnessy and O'Shaughnessy, 2002; Jin and Shin, 2021; Cao, 2021).

Indeed, technology innovations offer remarkable solutions for firms to interact with consumers and provide personalized experiences. However, they also entail challenges that cannot be disregarded, such as privacy concerns (Grewal et al., 2017). As the systems become increasingly "intelligent" further concerns arise as they can not only "augment human decision" but they can also "automate decisions" by making choices on individuals' behalf without their intervention (Candrian and Scherer, 2022 p. 2).

To summarize, as illustrated in this section, personalization has had and still is playing a central role in fashion and several conditions have endowed the fashion industry to implement a fully personalized system. Furthermore, as discussed in the previous sections, digital advances are offering many solutions to personalize the digital communication and fashion firms are progressively embracing them. Hence, this thesis argues that personalization in digital fashion communication is a fascinating area of research.

Chapter 3. Theoretical and conceptual background

This chapter presents the theoretical and conceptual foundations underpinning the thesis. To reach a comprehensive understanding of personalization in digital fashion communication, concepts and theories from various disciplines, such as communication, marketing, psychology, and HCI have been examined and applied.

3.1 Interpersonal and mass communication

As anticipated in section 2.1, the communication field is traditionally presented as divided in two subdisciplines, namely interpersonal and mass communication.

Interpersonal communication is conceptualized as a two-way non-mediated face-to-face interaction between very few individuals, normally two, who have some personal knowledge of one another (O'Sullivan and Carr, 2018). Mass communication refers to one-way mediated communication sent to a large audience of unknown individuals. The terms mass communication and mass media were coined at the beginning of the twentieth century to indicate those forms of mediated communications that took place through channels such as the newspaper, cinema, radio, and later on the television and could reach a large group of individuals – a population – with the same information (McQuail, 2010). Mass communication was denoted by (i) a centralized and standardized production of content subject to normative and political control, (ii) a monopolistic control of channels to persuade and inform the audience, (iii) an anonymous and disconnected audience. These characteristics reflected the historical period, a time of change in a newly industrialized society, an age of political and social changes characterized by migration into cities and across borders, and mechanization (McQuail, 2010).

Such division was largely accepted until the 1980s when communication scholars started questioning the relevance of the dichotomy between interpersonal and mass communication and arguing the need to reassess their conceptualizations. The conversation was driven by the emergence of new forms of interactive communication technologies that challenged the boundaries between one-way versus two-way communication, mediated versus non-mediated communication, and small versus large audiences. For example, it was recognized that interpersonal communication could no

longer be restricted to unmediated communication and could also occur through mediated communication channels (O'Sullivan and Carr, 2018).

The literature identifies the special issue of Human Communication Research of 1988 (O'Sullivan, 1999) as a crucial step towards a new communication vision. The issue provided a critical analysis of the "false dichotomy" between mass and interpersonal communication suggesting that treating them as separate subdisciplines was leading to a fragmented understanding of the communication field. Scholars argued that such division was not justified by theoretical foundations and that it was the result of historical conventions, a narrow and stagnant way to categorize communication research based on university needs: mass communication studies derived from the work of sociologists and political scientists interested in the opportunities brought by technologies such as the radio and the television to influence the mass; interpersonal communication studies were the focus of social psychologists focused on studying one-to-one interactions. The advent of new interactive communication technologies afforded by the Internet in the 1990s further challenged this distinction, as scholars recognized that the characteristics of the "new media" could not be explained by, did not fit in, and were often in opposition with the previous conceptualization of mass and interpersonal communication (Morris and Ogan, 1996; Rogers, 1999; O'Sullivan, 1999; Chaffee and Metzger, 2001; McQuail, 2010; Flanagin, 2017; O'Sullivan and Carr, 2018).

These new forms of communication can be described as "mass" in terms of their availability but do not always engage in mass communication as traditionally conceptualized. The changes involve: (i) level of communication, (ii) message source, (iii) audience size, and (iv) message control and content. Before the Internet, a communication technology could be matched to a level of communication, for example the television to the highest level and the radio to a regional and city level. Instead, the Internet challenges this rigid structure, enabling communication at all levels. In addition, the source of the message is blurred. If the traditional mass communication was associated to messages sent by institutions and interpersonal communication to messages delivered by individuals, new media enable messages from both sources. Similarly, the concept of audience size to differentiate communication types has lost its relevance as new media can be used to reach

audiences of many or few individuals, disregarding the notion of the audience as a "mass". Furthermore, the concept of message control is challenged as technological developments have allowed message sharing in ways that were previously not possible. New media are multidirectional, encourage response through two-way communication, and are interactive, reducing the possibility of message control from the original source, its placement, meaning, and reception. Moreover, the time order at which messages can be sent and received is disrupted as new channels afford simultaneous and delayed temporal dynamics. In terms of content, multimodal and highly personal messages can be designed (O'Sullivan, 1999; Chaffee & Metzger, 2001; Flanagin, 2017). Attempts to make messages more personal were made in mediated communication previous to the advent of the Internet by adopting linguistic stylistic features that simulated face-to-face interactions, for example by using personal pronouns, and verbs such as think and feel (Landert, 2014). This strategy is referred to as "synthetic personalization" as it gives the illusion of a more intimate dialogue even though the message is not personalized (Landert, 2014 p. 18).

As it emerges, the traditional constraints with which mass and interpersonal communication have been conceptualized have lost their relevance. New forms of ICTs do not only enable both forms of communication but they also create an overlap between them. Such advances have brought communication scholars to question whether the Internet means the end of mass communication and whether new theories are needed to study the new forms of communication afforded by technological advances (McQuail, 2010; Chaffee & Metzger, 2001).

O'Sullivan and Carr (2018) developed the masspersonal communication model, according to which a mass communication channel can be utilized for interpersonal communication and viceversa interpersonal channels can be used for mass communication. The model posits that it is not the channel itself that determines the type of communication, it is the way in which the addresser utilizes the channel and selects the content to determine the type of communication. Mass and interpersonal communication represent related forms of communication distinguished by two dimensions: perceived accessibility and personalization. Perceived accessibility refers to the degree to which the message is

perceived accessible, on a continuum from one individual to many; personalization is the degree to which the addressee perceives the message meets his / her preferences. Moreover, also the individual plays an important role in determining the type of communication based on his perceptions. Interpersonal communication is thus conceptualized as "high in personalization and low in message accessibility", whereas mass communication as "communication low in personalization and highly accessible" (O'Sullivan and Carr, 2018 p. 1167). In fact, as argued by Balbi and Kiitler (2016) no medium of communication is developed for one-to-one or one-to-many interactions. Indeed, the digital communication network was not thought for a specific communication pattern. Instead, it is the cultural, political, and economic interest of the society to dictate which mode of communication is preferred.

In light of such discussion, this thesis when referring to personalized communication does not create any distinction between the channels utilized by the fashion firms to reach their stakeholders. Instead, it focuses on the way in which the channels are utilized by the message sender, the content of the message, and the way in which the addressee perceives the message received. For example, email marketing can be utilized as a cost-effective form of mass communication to reach many individuals with the same message or to reach each individual with personalized content (White et al., 2008).

3.2 Segmentation and relationship marketing

Personalization is largely connected to relationship and one-to-one marketing (Vesanen, 2007). Despite the semantic differences, they all have a common principle: individuals have different needs and preferences; hence they cannot all be satisfied by the same offering. Such principle is rooted in the segmentation theory developed by Wendell Smith (1956) according to which consumers have various preferences and behaviours that can be gathered in homogenous groups, allowing firms to respond to their different needs in an efficient manner.

It is in the 1980s and 1990s that such principle attracted the interest of marketing scholars and developed in the so-called "relationship marketing". The term "relationship marketing" is attributed to Leonard Berry, who presented at the American Marketing

Association's Services Marketing Conference in 1983 a paper entitled "Relationship Marketing", representing the first time such term appeared in marketing studies (Berry, 2002). Relationship marketing is defined by Berry (2002 p. 61) as "attracting, maintaining and enhancing customer relationships". He argues that the service marketing approach of focusing on attracting new customers can be counterproductive and that effort should be directed to retaining existing ones by finding an incentive that motivates them to become loyal. Indeed, the concept of relationship marketing can be already identified in the pre-industrial era when there was a direct interaction between the consumer and the producer who created a product for each of its customers, representing a form of relationship marketing. The emergence of the mass production society (1870s) altered the supplier-customer relationship as interactions started to be mediated by intermediaries who were focused on maximizing the volume of sales, it is the period of the so-called transaction marketing. It is in the 1980s and early 1990s, with the rise of the mass customization society, that building relationships with customers regained importance over one off transactions, changing the perspective from transactional to relationship marketing.

Various factors have been identified for the strong interest in relationship marketing in the 1980s. An important driving force was represented by ICTs, which enabled a direct interaction between producers and consumers at scale. If in the pre-industrial era commercial relationships could be managed only at a local level and involved a limited number of clients, technology advances enabled to implement relationship marketing at a much boarder scale (Parvatiyar and Sheth, 2000). Berry (2002) in the commentary of his original work on relationship marketing states that although the original concept remains relevant, the information technology revolution has offered novel solutions for firms to implement it. Furthermore, the challenging economic situation and the recession of the early 1980s resulted in a global competitive market. Hence, being able to develop relationships rather than one off transactions became crucial. Another driving force was represented by the growth of the service economy as services are usually developed and provided by the same entity, diminishing the need of an intermediary and valuing relationships (Sheth, 2002; Parvatiyar and Sheth, 2000).

Two concepts of relationship marketing are extremely important for this thesis, one-to-one marketing and value co-creation.

According to one-to-one marketing, the creation of segments of one through mass customization can be crucial for the success of a firm by satisfying consumers through differentiation and products that fit specific needs to the point that price becomes irrelevant (Peppers and Rogers, 1997; Pitta, 1998).

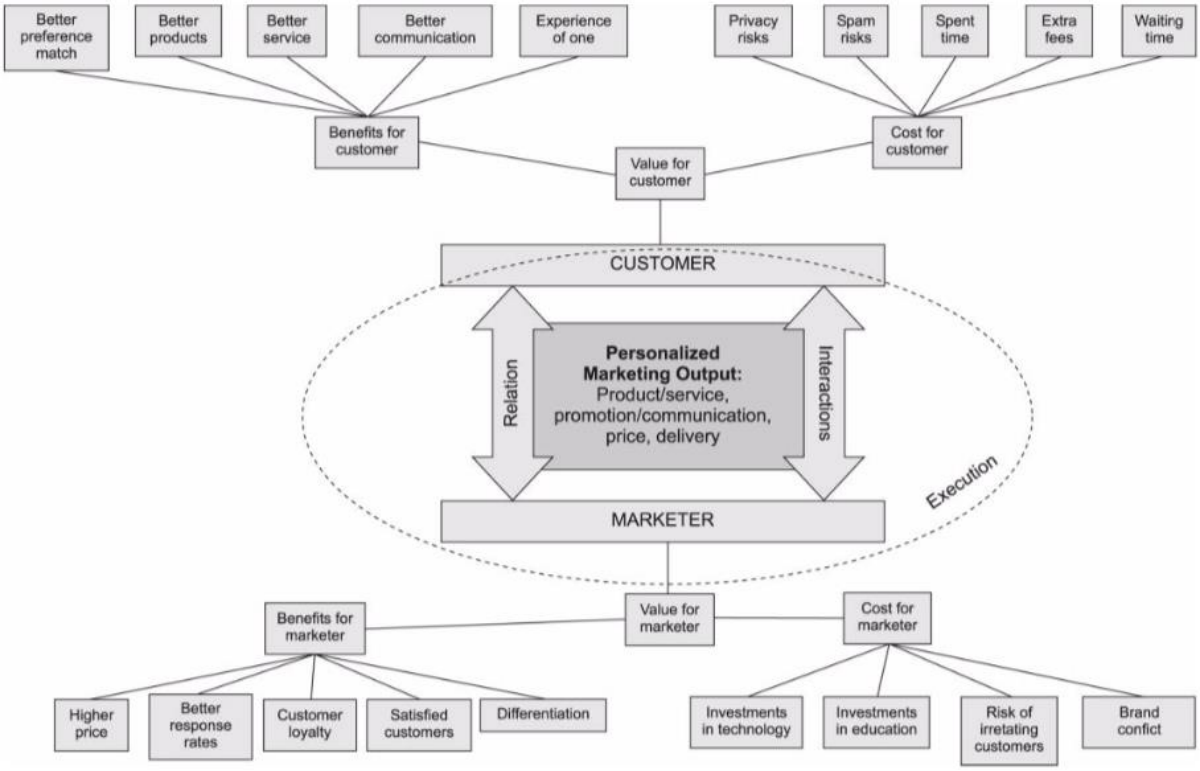
Peppers and Rogers (2000) suggest the "IDIC" methodology to implement the one-to-one marketing process: (I) Identify, (D) Differentiate, (I) Interact, and (C) Customize. The first step involves identifying the customers. Secondly, these customers should be differentiated by trying to understand their needs. Then, the company should interact with the customers in order to get to know them. These steps will enable to customize the treatment for each one of them. They suggest that the only way to do so in an efficient way is to rely on mass customization, which involves developing a product or service from a selection of pre-configured models (Peppers and Rogers, 2000). The principle of building a one-to-one relationship by treating each individual as a unique customer is the foundation of personalization (Vesanen, 2007). Technological advances afford many different ways to implement each step. Another development is the power brought by big data. In fact, if collecting data was a difficult and costly process, now firms have easier access to large amounts of data, hence today's challenge is that of making sense of the big data available.

The aim of relationship building is that of creating value for both the firm and the customer as they invest and commit resources in order to achieve mutual benefits (Sheth, 2017). In the current retail space, customers are not passive consumers and they play an active role in the co-creation of value with firms, for example by investing time (Prahalad and Ramaswamy, 2004). The personalization framework by Vesanen (2007) highlights personalization as a process that involves a trade-off of benefits and costs for both the customer and the marketer to create value (figure 2).

Building on relationship theory conceptualized as a collaborative co-creation of value between a firm and a customer who both invest resources in order to achieve a mutually

beneficial relationship (Sheth, 2017) and building on the personalization framework by Vesanen (2007), this thesis analyses personalization from both a firm and a customer perspective.

Figure 2. Personalization framework



Source: Vesanen (2007 p. 414)

3.3 Persuasion and perception

In order to gain a comprehensive understanding of personalization in digital fashion communication, persuasion and perception theories rooted in social-psychology are adopted in this cumulative thesis.

The link between persuasion and personalized communication is self-explanatory as among the ways in which individuals can be persuaded to change their attitude and / or behaviour is through delivering tailored information (Fogg, 2003; Kaptein et al., 2015). Furthermore, as predicted by Fogg (2003) nearly 20 years ago, persuasion technologies

have become embedded in our everyday lives and have become mainstream in the retail space.

Persuasion can be defined as a "symbolic process in which a source intends to convince people to shape, reinforce, or change their responses (e.g., attitudes, behaviours, intentions, and source perceptions) through the transmission of a message" (Dehnert and Mongeau, 2022 p. 2). As such, persuasion can take on a positive connotation when the intent is positive but also a negative one when the intent is misleading, such as in manipulation. When referring to persuasion, this thesis embraces Fogg's (2003 p. 15) definition of ethical persuasion, which does not involve "coercion and deception". In the persuasion attempt, the firm has the customer "at heart" and does not wish to deceive.

Persuasion can occur through different mediums, face-to-face interactions, traditional media such as print media, telephone, radio, and the web (O'Keefe, 2002). The interest of this thesis is on persuasion that occurs through computer technologies. As discussed by Fogg (2003), one of the first scholars to have studied the overlap between the areas of persuasion and computer technologies, the Internet and computer systems in general represent an effective way to persuade consumers.

Fogg (2003 p. 1, p. 5) defines persuasive technology as "any interactive computing system designed to change people's attitudes or behaviours" and coins the acronym "captology" to refer to the study of attitude or behaviour change derived from an individual's interaction with a computer technology. Computers were initially developed for data purposes, such as conducting calculations and storing data. The first computer systems with a persuasion intent were developed to encourage health and productivity in the 1970s, then with the emergence of the Internet, websites started being developed with a persuasion intent.

Computer technologies are not the first media to be adopted for persuasion purposes, for example, the television has long been utilized to persuade consumers. However, computer technologies are considered effective mediums to influence the persuasive effort as they enable interactive communications and offer the possibility to tailor information (Fogg, 2003; O'Keefe, 2002). A widely adopted model to explain the persuasive effects of personalized messages is the elaboration likelihood model (ELM) by Petty and Cacioppo

(1986). It theorizes that the addressee's likelihood to engage in the elaboration of the information received explains persuasion outcomes. According to the model, the addressee engages in different types of message elaboration under different conditions. Two broad routes to persuasion are identified: the central and the peripheral routes. When persuasion occurs through the central route, the elaboration is high. In this case, the addressee carefully examines the message and its arguments. Instead, when the persuasion occurs through the peripheral route, the elaboration is low. The addressee adopts simple decision rules in order to evaluate the message. Thus, as the level of elaboration varies, the persuasion fluctuates.

Broadly, two main factors impact the degree of elaboration: the addressee's motivation and the ability to engage in the elaboration process. Of high interest for the topic of personalization is the motivational factor of personal relevance as a message that is personally relevant increases the motivation to engage in the message (Petty and Cacioppo, 1986). Stemming from this model, personalization literature argues that personalized messages will result in higher effectiveness compared to general messages (see e.g., Munz et al., 2020).

Individuals utilize their intuitive persuasion knowledge in order to cope with the persuasion attempts they receive from firms (Morimoto, 2020). Persuasion knowledge is subjective, hence a firm's attempt to persuade is not received in the same manner by all individuals, for example it may be considered as manipulative or cooperative depending on how it is perceived by the individual (Friestad and Wright, 1994; Morimoto, 2020). This is explained by perception theory (McBurney and Collings, 1984). Perception is the "process by which an organism becomes aware of or responds to the environment" (McBurney and Collings, 1984 p. 6). The way each one of us interacts with others and with the world is different and no two individuals perceive the same situation in the same manner. Individuals adopt knowledge structures, called schemata, to make sense and interpret experiences, which are the result of the personal experiences they have during their lifetime and their culture. Such schemata are utilized to interpret and organize information and process experiences (McBurney and Collings, 1984). In fact, Friestad and Wright (1994 p. 2) refer to the persuasion act as an "attempt" in order to highlight that it

takes its meaning from the way in which it is perceived by the receiver. Building on such theories, Fogg (2003) and Li (2016) advance the idea that a message has to be perceived as personalized by an individual, yet it does not have to actually be personalized in order to persuade.

To conclude, these theories and concepts enable to study personalization both from the message sender side (the firm that attempts to persuade) and the message receiver side (the customer who perceives).

Chapter 4. Research gaps, questions, and methods

In the previous sections, personalized communication research was introduced while emphasizing the relevancy of researching it in digital fashion. Moreover, key theoretical concepts of (digital) personalized communication underpinning this thesis have been presented.

This chapter introduces the thesis' research gaps while highlighting their relevance (section 4.1), then it presents the research goal and the questions that have been developed to address the gaps (section 4.2). The chapter proceeds by presenting the methods adopted (section 4.3) and it concludes by providing a summary of the papers that form this cumulative thesis (section 4.4).

Table 1 provides an overview of the thesis overall goal, questions, methods, and contributions.

Table 1. Thesis overview

Overall research goal		
Identify how digital transformation is impacting fashion and creating value through personalization.		
Research questions		
Subchapter 5.1 (Sections 5.1.1, 5.1.2, 5.1.3)	Subchapter 5.2 (Sections 5.2.1, 5.2.2, 5.2.3)	Subchapter 5.3 (Sections 5.3.1, 5.3.2)
How is the digital transformation impacting fashion?	How is personalization defined and enacted in digital fashion communication?	Does – and if so how, to what extent, and under which conditions – personalization provide value to fashion stakeholders?
Methods		
Systematic literature review and longitudinal study OCM: Pillar V	(Systematic) literature review, Delphi study, and benchmark analysis OCM: Pillar I and II	Field experiments and focus groups OCM: Pillar III and IV
Main Outcomes		
a. Digital fashion framework b. Skills and competences required in digital fashion	a. Identification of definitions, dimensions, and conceptual discrepancies b. Definition of personalization and customization c. Newsletter practices and contents	a. Identification of positive and negative effects: explanation of the effects b. Construct of perceived personalization, refinement of effects explanations, and critical success factors
Overall research contributions		
Development of digital fashion research framework. Personalization construct and effects: conditions and circumstances under which it provides value.		
Managerial contribution		
Support digital fashion communication practitioners develop effective personalization strategies to create value for fashion stakeholders.		

4.1 Introducing the gaps

Overall, this thesis identifies two main gaps: the first gap relates to the ways in which digital advances are transforming fashion, the second gap narrows the focus to personalization in digital fashion communication.

4.1.1 Digital fashion transformation

Fashion is an understudied research field and it has long been considered unworthy of academic examination with the exception of few early scholars who recognized and acknowledged its importance (Simmel, 1957; Blumer, 1969; Alison, 1981; Davis, 1994; Barnard, 1996). Recently, scholars have started to reconsider the value of fashion research and rejecting the idea of it being a frivolous field (Negrin, 2008; Cantoni et al., 2020). In fact, as it will be extensively discussed in this thesis (see subchapter 5.1), fashion is a stimulating research area for several reasons. It is one of the largest sectors worldwide (BoF and McKinsey & Company, 2022), it impacts many aspects of our lives, and it is an integral part of us (Cantoni et al., 2020). It is an industry with its own dynamics, its own values, its own history, and processes, yet it interplays with many sectors, such as the manufacturing, financial, communication, and education sectors, requiring interdisciplinary research (Cantoni et al., 2020). Furthermore, as introduced in section 2.2, the fashion industry is undergoing an unprecedented digital turmoil making it a fruitful and rich research domain.

Digital advances are transforming every aspect of the fashion industry (Kalbaska et al., 2019): the ways in which firms produce goods, manage inventory and logistics, the ways in which products and services are communicated and marketed, the ways in which consumers search for, purchase, and consume products. Digital advances are not only creating new possibilities for the industry, they are also affecting former practices (Guercini et al., 2018). Hence, employees with adequate skills and competences for the digitally transforming fashion industry are required (Kalbaska and Cantoni, 2019).

As the digital transformation of the fashion industry is a relatively new yet fast evolving phenomenon, it requires further ad-hoc and systematic attention (Guercini et al., 2018; Kalbaska et al., 2019; Alexander and Blazquez Cano, 2020; Voyer and Ko, 2021).

Four underlying considerations by Cantoni et al. (2020) which summarize the extant gaps in digital fashion research are considered throughout this cumulative thesis. The need to: (i) study key digital fashion communication research topics, (ii) advance fashion research through various methodological and theoretical considerations, (iii) foster collaborations between academic research and the industry, (iv) adopt a long-term approach to fashion research.

4.1.2 Personalization in digital fashion communication

Narrowing the focus to personalization research, two main gaps are identified: personalization (i) definition and its (ii) value.

Personalization, although being widely studied, lacks clarity and a precise definition on which scholars agree upon (see e.g., Fan and Poole, 2006; Vesanen, 2007; Tomczyk et al. 2022; Aksoy et al., 2021; Riegger et al., 2021; Strycharz et al., 2019).

Various motivations have been identified in the literature suggesting various reasons for which it has been challenging to map out personalization, hereafter summarized.

The meaning of personalization has changed over time. As seen in the introduction of this thesis (section 2.3), it has been a fundamental practice for centuries and its meaning keeps evolving as a result of digital advances (Tomczyk et al. 2022), making it challenging to grasp its essence. Generally, the concept of personalization is used across fields as an umbrella term to refer to a matching process between an individual's preferences and the offer provided (Vesanen, 2007).

Another source of confusion derives from its overlap with other concepts (Tomczyk et al., 2022). A stream of scholars utilizes "personalization" interchangeably with terms such as customization, tailoring, and one-to-one marketing (e.g., Srinivasan et al., 2002; Kwon et al., 2017; Tyrvainen et al., 2020). Another stream, although recognizing its closeness to such concepts, considers it a different construct with its unique features (e.g., Salonen and Karjaluoto, 2019; Morimoto, 2020; Villanova et al., 2021). However, also among the scholars who differentiate between the terms, there are some divergences in the ways in which they are conceptualized. In order to differentiate the concepts and also highlight

their similarity, other terms, such as customerization (Wind and Rangaswamy, 2001) and customized personalization (Suprenant and Solomon, 1987), have been introduced. This phenomenon called "proliferation", where different names are used to refer to the same concept, is a sign of confusion (Podsakoff et al., 2016 p. 166). Being able to clearly define a concept and distinguish it from other related ones is imperative to advance its understanding (Suddaby 2010; Podsakoff et al., 2016). Thus, this thesis identifies the ongoing debate regarding the lack of an agreed upon definition and whether it can be used in overlap with other concepts as an inhibiting factor to its advancement.

Furthermore, the conceptualization of personalization remains unclear as an agreement on its attributes is yet to be achieved (Fan and Poole, 2006). For example, personalization is described as a process which is firm-driven in order to differentiate it from customization as a customer-driven construct (e.g., Montgomery and Smith, 2009; Kalaignanam et al., 2018; Aksoy et al., 2021). Yet, such distinction is not fully accepted as others suggest personalization can be both a firm- and a user- driven process (Wind and Rangaswamy, 2001). Without a common language on a concept, it is difficult for scholars to communicate and develop a shared discussion (Podsakoff et al., 2016), representing another obstacle to personalization's progress.

Additionally, the challenge of conceptualizing personalization derives from it being a subjective feature, which highly depends on consumers' perception, a further challenge in reaching an understanding of personalization (Li, 2016; O'Sullivan and Carr, 2018).

Notwithstanding, a comprehensive definition of personalization able to capture its complexity in light of digital advancements has yet to be achieved. Having a clear definition of a concept is extremely important in order to conduct research as it represents the building block of theory development (Suddaby 2010; Podsakoff et al., 2016). The lack of a definition can lead to ambiguous and imprecise research findings. In fact, if the concepts upon which the research is built are not clear, it can be challenging to derive sound results (Osigweh, 1989).

Hence, the lack of a comprehensive definition of personalization is suggested as one of the underlying reasons of the other gap identified in this thesis, the challenge of determining its value.

Stemming from communication, marketing, and psychological theories discussed in chapter 3, personalization is expected to provide win-win benefits for its stakeholders. Indeed, many positive outcomes of personalization have been identified in the literature: it offers financial gains for firms and also for consumers by triggering purchase intention and sales (Goic et al., 2022; Choi et al., 2017; Pappas, 2018), it improves the customer experience (Tyrvainen et al, 2020) and makes it memorable (Ameen et al., 2022), it increases customer-brand engagement and connection (Tran and Strutton, 2020; Ansari and Mela, 2003), it enhances customer loyalty (Srinivasan et al., 2002), and it triggers positive brand attitudes by increasing message relevance (de Groot, 2022). Notwithstanding, personalization is not without risks as negative effects tied to privacy concerns have also been identified (Bleier and Eisenbeiss, 2015; Aguirre et al., 2015; Teeny et al., 2020; Villanova et al., 2021). Personalization can create a sense of intrusiveness, for example when messages are perceived as too invasive or they interfere with other activities, hindering goal achievement (Smink et al., 2020; de Groot, 2022).

The inconclusive and often contrasting results have brought scholars to question the value of personalization and to further analyse the circumstances under which personalization is (in)effective (see e.g., Morimoto, 2020; Villanova et al., 2021; Tomczyk et al. 2022; de Groot, 2022). Beyond the lack of a clear conceptualization previously discussed, various factors have been found to impact the effects of personalized communications and their value, such as the timing at which the message is sent (Salonen and Karjaluoto, 2019), the level of personalization (Walrave et al., 2016), the data collection method (Hayes et al., 2021), the platform adopted to deliver the personalized message (van Ooijen, 2022), and individual's characteristics and perception (Li, 2016; Schreiner et al., 2019).

Lastly, research rarely focuses on diving deep into individuals' perspectives of personalization (Tomczyk et al. 2022). In fact, whilst acknowledging the importance of individuals' perception in determining personalization (Li, 2016; O'Sullivan and Carr,

2018; Tomczyk et al. 2022), very few qualitative studies that examine individuals' perceptions in order to shed light on its value have been identified.
As stated by Hayes et al. (2021 p. 16) personalization is a "double edge sword", hence it is of vital importance to unravel its understanding and determine its value for fashion stakeholders.

4.2 Addressing the gaps: research goal and questions

The research goal of this thesis is to examine and identify how the digital transformation is impacting fashion and creating value for its stakeholders through personalization.
To this end, this thesis aims to examine (i) fashion's digital transformation and (ii) personalization in digital fashion communication through the following research questions:

Research question 1:
How is the digital transformation impacting fashion?

- **Research question 1a.**
  What is the state of the art of digital fashion research?
  This question frames digital fashion research and narrows the focus to digital fashion communication from an academic perspective.

- **Research question 1b.**
  What are the skills and competences required by the digitally transforming fashion industry?
  This question complements question 1a by adopting an industry perspective.

Research question 2:
How is personalization defined and enacted in digital fashion communication?
This question leads the exploration of personalization from a fashion communication perspective.

Research question 3:

Does - and if so how, to what extent, and under which conditions - personalization provide value to fashion stakeholders?

By analysing personalization practices and their effects, this question guides the investigation of personalization value for fashion firms and consumers. Moreover, it enables to tackle how personalization strategies are evolving.

While anchored by an overall goal, each of the studies is guided by specific research questions that enable to examine an aspect of the overreaching questions.

The remaining sections of this chapter provide an overview of the methods adopted to address the research questions (section 4.3) and introduce the studies that form this cumulative thesis (section 4.4).

4.3 Methodological considerations

This section outlines the methodological approaches utilized in the papers included in this thesis.

The variety of the methods adopted, both qualitative and quantitative, enable to address the research questions of each study while reaching the overall thesis goal of examining the digital transformation of the fashion industry and gaining an in-depth understanding of personalization from both a firm's and a consumer's perspective.

Furthermore, they allowed to integrate and overcome, to a certain extent, the limitations of each method.

Studies 1 and 2 (sections 5.1.1 and 5.1.2) utilize the systematic literature review approach in order to collect and synthetize the state of the art of digital fashion research in a "systematic, transparent, and reproducible" manner (Snyder, 2019 p. 334). Such method enables to critically analyse the state of fashion and develop a comprehensive framework starting from the studies identified. Furthermore, the systematic literature review, which is also an effective method to inform directions for future research (O'Hagan et al., 2018), guided the development of subsequent studies by identifying interesting areas of research.

Study 3 (section 5.1.3) employs a longitudinal approach in order to identify how the skills and competences required by fashion firms from their employees are evolving in respect to a study conducted in 2017. The longitudinal approach, which captures the ways in which a phenomenon changes over time (Ployhart and Vandenberg, 2010), enables to depict how the competences and skills are evolving in the digitally transforming fashion industry.

Study 4 (section 5.2.1) conducts a literature review in order to help navigate the complexity of personalization research and analyse a large body of research available. Then, a systematic literature review is performed with the aim of narrowing the focus to personalization studies in the fashion field. Such method is adopted as it allows to identify the ways in which personalization is defined in the literature and determine the sources of inconsistencies and contradictions (Snyder, 2019; O'Hagan et al., 2018).

Study 5 (section 5.2.2) employs the Delphi method to build on the analysis of the literature review (presented in section 5.2.1). As a consensus method useful to try overcoming the inconsistencies regarding a concept and reach unanimity among a panel of experts (Jones and Hunter, 1995), the Delphi method enables to reach a definition of personalization in fashion. Moreover, by involving fashion practitioners and scholars, it represents an important first step in fostering a communication between the industry and academia, an overreaching goal of this thesis.

In study 6 (section 5.2.3), a benchmark analysis, a useful method for analysing industry practices (Hassan and Li, 2005), is conducted in order to examine how newsletters are utilized in the fashion industry. The contents of the newsletters are analysed through a quantitative content analysis. The preliminary insights from the benchmark lay the foundation for the development of the email marketing experiments (section 5.3.1).

In study 7 (section 5.3.1) two field experiments are carried out with fashion brands in order to measure the effectiveness of personalized messages. This method is selected in order to measure actual rather than self-reported consumer behaviour in response to receiving messages personalized at different levels. Moreover, although field experiments offer researchers limited control and they are subject to various cofounding variables, such method enables to study personalization outside the laboratory setting (Viglia and Dolnicar, 2020). Furthermore, it provides a further opportunity to collaborate with fashion practitioners and develop a project of mutual interest for the academia and the industry.

Study 8 (section 5.3.2) employs a qualitative approach by conducting focus groups. No two consumers are the same and understanding their behaviour is complex (Nguyen et al., 2022), hence this method is considered appropriate to give voice to fashion consumers, understand what they perceive as personalization, and dive deep into the motivations of personalization (in)effectiveness. By offering rich descriptions of their positive and negative experiences, it allows to study what consumers like and dislike in terms of personalized communication strategies and identify possible areas of improvement, further complementing the findings from the field experiments (section 5.3.1).

4.4 Overcoming the gaps: summary of the studies

The main body of this cumulative thesis is formed by eight studies.

This subchapter provides an overview of the studies, their objectives, their methodological approach, their outcomes, and main contributions.

The papers are organized in three sections, reflecting the three overreaching research questions presented in section 4.2.

4.4.1 Digital fashion transformation

The three studies in this section (table 2) address the ways in which the digital transformation is impacting fashion.

Table 2. Digital fashion transformation studies

Subchapter 5.1	**References**
Section 5.1.1 (Study 1)	Noris, A., Nobile, T.H., Kalbaska, N. & Cantoni, L. (2021). Digital Fashion: A systematic literature review. A perspective on marketing and communication, Journal of Global Fashion Marketing, 12(1), 32-46.
Section 5.1.2 (Study 2)	Nobile, T.H., Noris, A., Kalbaska, N. & Cantoni, L. (2021). A review of digital fashion research: before and beyond communication and marketing, International Journal of Fashion Design, Technology and Education, 14(3), 293-301.
Section 5.1.3 (Study 3)	Nobile, T.H., Kalbaska, N., de Oliveira, R.A. & Cantoni, L. (2021). Digital Fashion Competences: A Longitudinal Study. In: Sádaba T., Kalbaska N., Cominelli F., Cantoni L., Torregrosa Puig M. (eds) Fashion Communication. Springer, Cham, 17-28.

Study 1 (section 5.1.1) entitled *"Digital Fashion: A systematic literature review. A perspective on marketing and communication"* addresses the thesis overreaching research question regarding 'how the digital transformation is impacting fashion' by providing a framework of digital fashion research. Conceptually, this study frames digital fashion research offering an in-depth overview of the state of the art of digital fashion studies. Empirically, the systematic literature review approach adopted to conduct the analysis represents a unique attempt to categorize digital fashion research studies from the year 1998 to 2019 into a comprehensive framework. The framework is formed by three main categories: (i) Communication and Marketing (C&M); (ii) Design and Production (D&P); and (iii) Culture and Society (C&S). For each of the categories, subcategories were identified: C&M: Practices, C&M: Enabling Tools, C&M: Societal Implications; D&P: Process and Technology Implementation, D&P: Product Development, C&S: Culture; C&S: Education, C&S: Society.

Study 2 (section 5.1.2) entitled *"A review of digital fashion research: before and beyond communication and marketing"* extends while at the same focalizes the state of the art on digital fashion research. It broadens and complements study 1 by conducting a literature review on the categories (ii) Design and Production (D&P) and (iii) Culture and Society (C&S) and it also extends the research by showing the pervasiveness of the digital transformation. The analytical approach of study 1 and 2 enables to address the overreaching research question regarding the way in which technology is impacting the fashion industry by covering and analysing a large portion of fashion studies. Overall, studies 1 and 2 offer a distinctive contribution regarding the state of the art of fashion research and provide a solid foundation for the advancement of the digital fashion field.

Study 3 (section 5.1.3) *"Digital Fashion Competences: A Longitudinal Study"* addresses the thesis research question regarding the digital transformation of the fashion industry from an industry perspective by providing a comprehensive overview of the skills and competences required in the digital fashion job market. The study adopts a longitudinal approach in order to uncover any differences from a similar research conducted in 2017. In doing so, it stresses the importance of researching the way in which the digital disruption is impacting the fashion job market. Methodologically, the job postings related to the digital fashion market were collected on LinkedIn through a web-scraping tool from May 2020 to June 2020. Overall, the study results show that the number of positions remained stable compared to the study conducted in 2017, a meaningful outcome considering the data collection took place during the Covid19 pandemic, an exceptionally challenging time, characterized by high unemployment rates but also an increase in digital activities. The study emphasizes that employees who work in digital fashion require a large set of skills, from soft communication to operational skills. Furthermore, the study results represent interesting findings also for development of updated digital fashion curricula, which take into consideration the evolving market requirements.

4.4.2 Defining personalization

The three studies in this section (table 3) narrow the focus to personalization in digital fashion communication.

Table 3. Defining personalization studies

Subchapter 5.2	**References**
Section 5.2.1 (Study 4)	Nobile, T.H. & Kalbaska N. (2020). An Exploration of Personalization in Digital Communication. Insights in Fashion. In: Nah FH., Siau K. (eds) HCI in Business, Government and Organizations. HCII 2020. Lecture Notes in Computer Science, vol 12204, 456-473 Springer, Cham.
Section 5.2.2 (Study 5)	Nobile, T.H. & Cantoni, L. (2022). Personalization and customization in fashion: searching for a definition, Journal of Fashion Marketing and Management.
Section 5.2.3 (Study 6)	Nobile, T.H. & Cantoni L. (2021). Digital Fashion Communication: An Explorative Study of Fashion Newsletters. In: Soares M.M., Rosenzweig E., Marcus A. (eds) Design, User Experience, and Usability: Design for Contemporary Technological Environments. HCII 2021. Lecture Notes in Computer Science, vol 12781, 326-339, Springer, Cham.

Study 4 (section 5.2.1) entitled *"An Exploration of Personalization in Digital Communication. Insights in Fashion"* investigates the definitions of personalization with two main aims: (i) provide a broad overview of the ways in which personalization is defined in the literature, identify its main elements, and the sources of discrepancy from the definitions, (ii) narrow the view of personalization research to the fashion field in order to conduct a review of the state of the art of personalization studies in digital fashion.

The research shows that personalization research lacks a commonly agreed definition beyond its general meaning of creating a match between the need of an entity and the offer provided by another entity. Furthermore, the term is found to be utilized as an umbrella term in overlap with other concepts, representing a source of confusion. The most emblematic example identified is that of personalization and customization.

Furthermore, the systematic literature review shows that personalization is understudied in the fashion domain and that there is no definition specific to fashion. Considering the relevance of personalization in the fashion industry, such findings are surprising.

Hence, overall, this study provides interesting avenues for future research in defining personalization in fashion.

Study 5 (section 5.2.2) entitled *"Personalization and customization in fashion: searching for a definition"* provides a comprehensive definition of personalization relevant to the digital fashion context through the Delhi method. By developing a definition that reaches 100% consensus from fashion experts, it partly overcomes the gaps identified in study 4 (section 5.2.1). This study provides theoretical contributions to personalization research by identifying the building components of the concept and clarifying its meaning in the digital fashion context. It also offers managerial implications by providing fashion managers a clear understanding of the stakeholders, goal, and components that should be kept into consideration when developing and implementing personalization strategies.

Study 6 (section 5.2.3) entitled *"Digital Fashion Communication: An Explorative Study of Fashion Newsletters"* conducts an explorative analysis of the fashion industry's digital communication practices in terms of email marketing. The overall aim of this study is to understand whether fashion brands utilize email marketing to reach consumers and to what extent it is adopted for personalized communication. A benchmark analysis of the top 50 apparel brands according to the 2020 brand finance directory is conducted in order to identify: (i) how many brands have a newsletter, (ii) the *stimuli* used to invite individuals to subscribe to the newsletter, (iii) the content of the newsletters sent by the firms to confirm the subscription, (iv) any explicit forms of personalization in the newsletters. Results show that most brands (forty-six of the fifty brands analysed) have a newsletter, highlighting their relevance as a communication channel. In terms of subscription stimuli, three main themes are found, cognitive, emotional, and financial. Furthermore, from subscription confirmation emails low levels of explicit personalization are identified. Overall, this study supports the relevancy of studying personalization in fashion newsletters and provides useful insights regarding firm's use of such channel. These insights represent a useful starting point upon which the experiments of study 8 (section 5.3.1) are designed.

4.4.3 Personalization value

The two studies in this section (table 4) address the value of personalization in digital fashion communication from a firm and a consumer perspective.

Table 4. Personalization value studies

Subchapter 5.3	**References**
Section 5.3.1 (Study 7)	Nobile, T.H. & Cantoni, L. (2022). Personalization (in)effectiveness in email marketing, Journal of Applied Communication Research.
Section 5.3.2 (Study 8)	Nobile, T.H. & Cantoni, L. (2022). Perceived personalization and critical success factors in digital fashion communication: an insight from fashion consumers, International Journal of Communication.

Study 7 (section 5.3.1) entitled *"Personalization (in)effectiveness in email marketing"* investigates the effects of personalization in email marketing in order to understand whether it provides value to fashion retailers. Value in this study is determined by the effectiveness of personalization measured with the key performance indicators of open, click-through, and purchase rates.

Two field experiments were designed. For the first experiment, a treatment group received a newsletter with their personal name and a control group received the exact same newsletter with the exception of the name in order to identify any differences in terms of open and click-through rates. No significant effects of personalization are identified. For the second experiment, messages with three levels of personalization ("low", "medium", and "high") were created and randomly delivered to recipients who found themselves in different shopping phases. Results of open, click-through, and purchase rates show contrasting effects of personalization. The interplay of personalization level and the customer journey phase provide possible explanations of the positive and negative effects. Overall, it emerges that personalization is not always more effective than standard messages in email marketing.

Study 8 (section 5.3.2) entitled *"Perceived personalization and critical success factors in digital fashion communication: an insight from fashion consumers"* explores personalization from a consumer perspective. By building on the construct of perceived personalization, the study aims to understand the conditions under which individuals perceive a fashion object to be personalized and identify its critical success factors. A qualitative approach is adopted in order to dive deep into consumers' experiences, opinions, and perceptions. Data is collected through eight focus groups.

Study results show that individuals consider an object to be personalized when it adds a cognitive, emotional, or a combination of both dimensions to the shopping experience. Additionally, six factors, which are crucial for consumers, are identified. These are grouped in two categories: the first category refers to personalization quality (sense of control, quality of recommendations and information, and dynamism) and the second category to the quality of the message (timing, quantity, and look).

These findings enable to bridge the questions regarding personalization's definition and its value from a consumer perspective.

Chapter 5. Results

5.1 Digital Fashion Communication

5.1.1 Digital fashion: a systematic literature review. A perspective on marketing and communication

Published Manuscript: first co-authored with Alice Noris

Noris, A., Nobile, T. H., Kalbaska, N. & Cantoni, L. (2021). Digital Fashion: A systematic literature review. A perspective on marketing and communication, Journal of Global Fashion Marketing, 12(1), 32-46. https://doi.org/10.1080/20932685.2020.1835522

Abstract

Research in the overlapping area between Fashion and Information and Communication Technologies – hereafter referred to as "Digital Fashion" – is growing and attracting the interest of both academics and practitioners. However, due to the richness and heterogeneity of the involved fields, no map is already available of it. A systematic literature review was conducted in July 2019 utilizing the keywords "digital" and "fashion" in five research databases, including academic papers from 1998. This provided 491 relevant items for analysis. Three main categories to which those research papers belong to are identified: (i) Communication and Marketing (C&M); (ii) Design and Production (D&P); and (iii) Culture and Society (C&S). Each category includes two or three subcategories. This study provides an overview of the state of the art of digital fashion studies, with a focus on Communication and Marketing related research.

Keywords: Digital fashion; e-fashion; fashion marketing; fashion studies; fashion technology

1. Introduction

The globalization and the still undergoing transformation of economies and societies towards new organizational models have affected the academic field and impacted many sectors and disciplines contributing to the current debate on how digital technologies are shaping our environment; in this sense fashion as well, has not been exempt from the impact of the digital transformation, changing both the market and consumers' practices of consumption (Andò et al., 2019).

As stated by Bertola and Teunissen (2018) the fashion industry should be considered as an interesting environment in order to evaluate the implications of the so-called Industry 4.0 paradigm and of the digital transformation. Fashion is a relevant context to frame for multiple reasons: from a diachronic point of view, this sector has played a key role during the industrial revolutions that occurred during the centuries and historically it has been considered as a "design-driven" sector, where often designers and managers cooperate in order to create a brand and a successful business model, interacting locally or globally with the environment.

From a synchronic point of view instead, fashion has taken a central role in mass production (Bertola & Teunissen, 2018) and it is considered the third largest manufacturing industry in the world, only preceded by electronic and automotive sectors (Karaosman et al., 2016). In fashion, issues such as pollution, fabric waste and corporate social responsibility are crucial for practitioners and scholars, in order to reach an equilibrium between sustainability and increasing commercial pressures (Johnson et al., 2013; Karaosman et al., 2016; Kong et al., 2016).

Furthermore, fashion should not be considered as a passive sector, influenced and changed by the undergoing digital transformation, it is a dynamic field in continual progress, which impacts everyday life of individuals. It contributes to the development of commercial activities, relationships among people, fields such as art, music, literature, culture, beauty, and many more. As stated by Kalbaska et al. (2019), it is also a matter of communication: from a more personal level fashion helps people to communicate their own identity, who they are and also who they would like to be, and from a wider level, it gathers together

many communication and marketing experts, coming from different fields and having different backgrounds.

The increasing societal impact of fashion as a field has also been made possible due to the changes that occurred in technology and to the interactions that the fashion sector has been able to develop within the digital framework (Guercini et al., 2018). Nowadays, fashion can interact with information and communication technologies across different layers, concurring in the adoption of digital media and in the development of new ways of designing and producing (Rocamora, 2017), helping communities to identify practices of the self and intertwining with all the aspects involved in globalization. Although little attention has been given by scholars to the analysis of strategies utilized to penetrate international markets through the Information and Communication Technologies (ICTs), recent studies show how the use of internet is revealing itself as key factor for fashion companies when it comes to create an interplay between online and offline channels (Guercini et al., 2020).

Fashion actively interplays with digital media or ICTs, becoming a fertile ground for the integration of digital tools both into the fashion business and industry as well as within the experience of customers and prospects (Kalbaska & Cantoni, 2019; Soni et al., 2019). It is also a vivid research domain, including interdisciplinary studies, varied approaches and multiple research methodologies (Cantoni et al., 2020).

2. Research gap & process

Digital fashion-related studies are flourishing in many different contexts. This study aims to develop a comprehensive framework of the digital fashion field in order to describe and classify it. The goal of such classification is to provide an overview of the state of the art of digital fashion and to support academics and practitioners navigate in such an emerging and varied field.

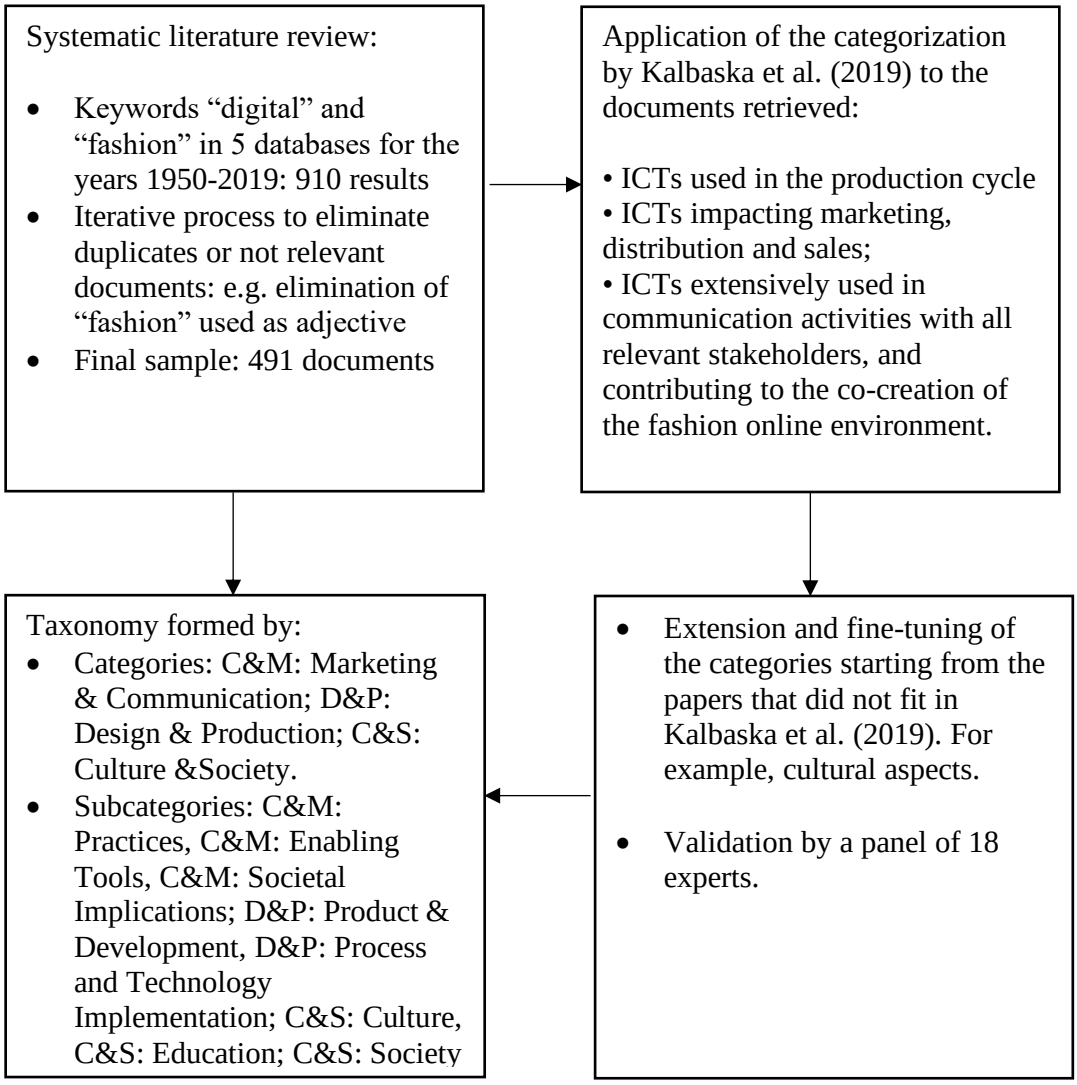
A systematic literature review was conducted to retrieve and to select the relevant research items. It was conducted following the key steps by Johnsen et al. (2017), including planning, conducting the review and reporting the findings. To identify the relevant papers, five databases were selected in order to account for the complexity of the domain.

The research was conducted on the databases from the 9th till the 15 July 2019. The databases were selected on their expected relevancy for the topic: IEEE and ACM due to their technology and digital focus, Eric for the importance of education for the fashion industry, Springer Link for the social aspect and Scopus to identify the maximum number of papers and validate cross-database presence of research papers. Used keywords were: "fashion" and "digital". These search terms were utilised differently according to the databases in order to capture the highest number of papers. The search was not limited to journal articles. Specialized magazine articles, conference papers and books were also considered to gain an updated view of the developments in digital fashion. Although the focus of the research is marketing/ communication, no filters were applied for the search with the aim of creating a taxonomy which reflects the interdisciplinarity of fashion, which is not limited to one discipline. When analysing books, individual chapters were considered. Titles and abstracts have been considered for the analysis, whereas the introduction was utilised for the items with no abstract. Only documents in English were considered. The time frame considered was from 1950 till 2019. The search provided 910 results. The following section provides details of the selection process. First, the title and the abstracts were analysed in order to verify the relevance of the papers according to the keywords. Researches that were clearly not focused on fashion were excluded, for example, those that utilised the term "fashion" only as an adjective were withdrawn from the analysis. Moreover, papers that were present in more than one database were counted only once. As a result, a total of 491 bibliographic items were considered relevant for this study.

All the papers were analyzed following the categorization suggested by Kalbaska et al. (2019): ICTs in the first level are adopted to design and produce fashion items, in the second level they are endorsed to market and sell the products, and in the third level they are utilized in communication activities to shape (life)styles and trends. This analysis enabled to identify gaps, which suggested the need to further discuss and elaborate the existing categories. The papers which did not fall in one of the existing categories were further analysed to place them within new categories. This iterative process was conducted by two researchers through an in-depth analysis of the abstracts. This provided a first

categorization of the documents in six categories. Through the support of a third researcher, a taxonomy (from the Greek word *taxis*, meaning order, and *nomos*, which means law or science) was developed. The taxonomy allowed a hierarchical categorization through both a bottom-up approach, ensuring completeness and (ideally) mutually exclusiveness of categories, as well as a top-down one, validating and refining the layers of digital fashion. It was then presented and further discussed with a panel of 18 participants, involving 10 PhD candidates, 4 postDoc researchers, 2 professionals, 2 professors. All of them are working/researching on the topics related to fashion communication or online communication in general. The suggestions were analysed in order to incorporate them in the final categorization and lead to an agreed taxonomy (Figure 1). The present taxonomy is the first step towards a state of the art and an effective classification of the digital fashion domain, laying the foundations for the possible development of an ontological framework of the field. It will contribute to the development of an interaction among stakeholders, which can support a further advancement of the field: its aim is to leverage semantic heterogeneity and to depict the needs of the community simplifying and improving the communication among the different groups of interest (Velardi et al., 2007). The next section presents the sample and reports the proposed taxonomy.

Figure 1: Process to reach the taxonomy



2.1. The sample

The time frame considered for database research was from 1950 till 2019. No study was found before 1998 (Figure 2). Indeed, as stated by Cantoni and Tardini (2006) the World Wide Web (WWW) was invented in the early 90s'. At the end of the nineties and at the beginning of the XXI century the major online and e-commerce platforms and social media arise, in line with the data retrieved from the present study in digital fashion. Within the studied period, the years 2018 and 2017 have the highest number of publications, with

105 and 77 publications respectively. Overall, the number of publications addressing the topic of digital fashion shows an upward trend, which indicates a growing interest and attraction to the topic. Data collection was done in July 2019, this explains the apparent decrease in the number of publications in that year. Assuming an even distribution of publications along the year, and a delay in their enlisting within the bibliographic databases, we might suppose that the trend is still active in 2019. Furthermore, the consistency of the suggested trend is also supported by recent studies, which show that the chances derived from online channels are remarkable (Guercini et al., 2020; Guercini & Runfola, 2015). The majority of studies are conference papers (281), followed by the papers published in books (123), academic journals (85) and magazines (2). The country of the institution to which the first author is affiliated has been taken into consideration. In the situation where the first author is affiliated to more institutions, based in different countries, all the countries are considered in the count. China is the country with the most publications in this field, followed by the USA, UK and Italy. Figure 3 presents the countries according to the first author's different affiliations. Only the ones with five or more affiliations are considered.

Figure 2. Papers per year of publication (The data refers until July 2019)

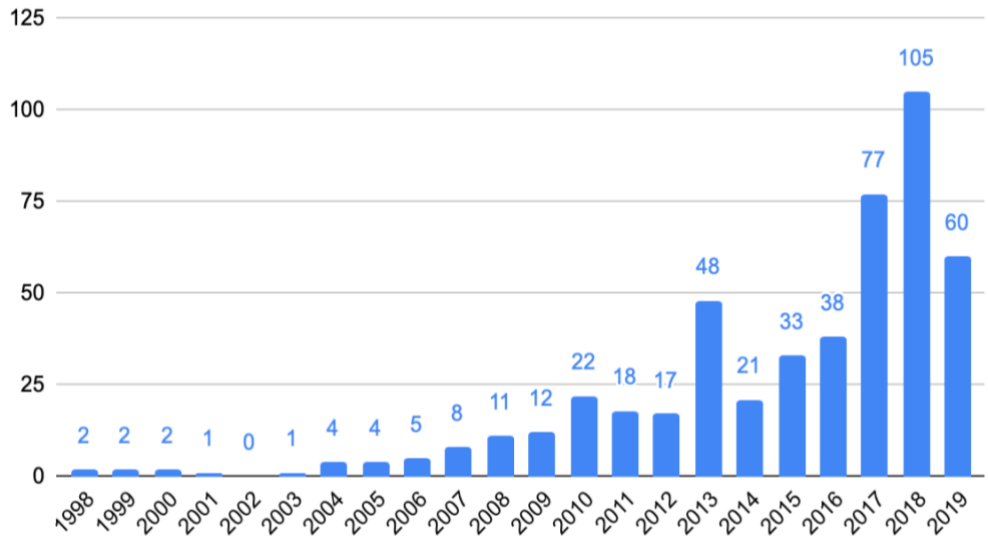
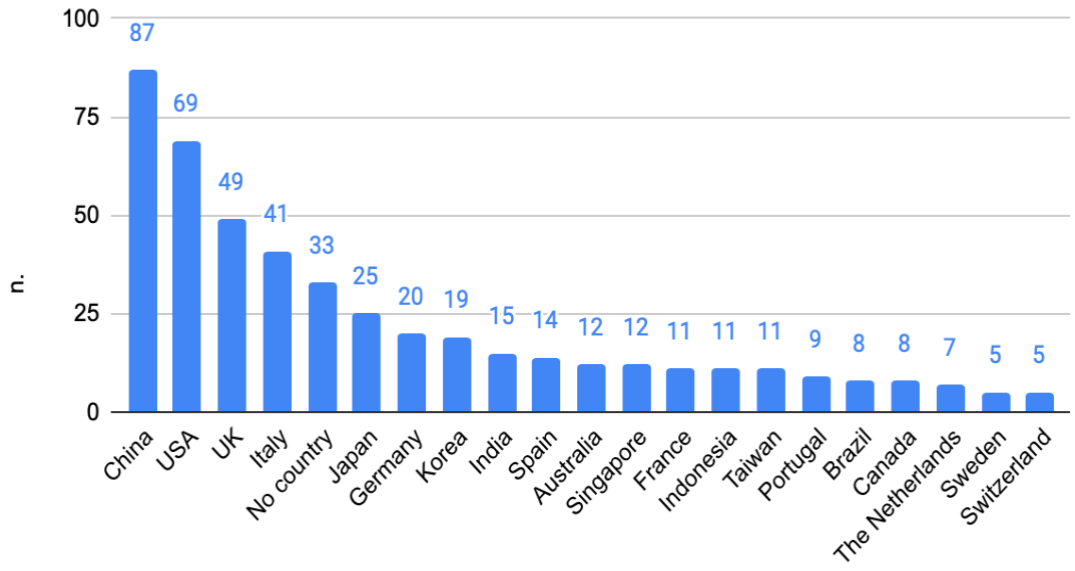


Figure 3. Countries according to first author's affiliations (Only countries with 5 or more units are displayed. Authors who have more than one affiliation are counted multiple times. The wording "No country" has been used when the country could not be identified) (The data refers until July 2019)



3. Categories descriptions

Three categories have been identified from the analysis, namely (i) *C&M – Communication and Marketing*; (ii) *D&P – Design and Production*; and (iii) *C&S – Culture and Society*. In fact, if we consider the number of papers belonging to each category, more than half do belong to the category *C&M* (255), followed by *D&P* (155) and *C&S* (81). A description of each of the terms utilised is provided in order to frame the categories and to offer a deeper understanding of the taxonomy, focusing on the first one, and briefly outlining the other two. Table 1 presents an overview of the categories and subcategories.

Table 1. Categories and Subcategories.

Categories	# of items	Subcategories
C&M – Communication and Marketing	255	C&M: Practices (#119) C&M: Enabling Tools (#109) C&M: Societal Implications (#27)
D&P – Design and Production	155	D&P: Process and Technology Implementation (#95) D&P: Product Development (#60)
C&S – Culture and Society	81	C&S: Culture (#53) C&S: Education (#22) C&S: Society (#6)
Total	491	

3.1. Category C&M – Communication and marketing

The category *Communication and Marketing* includes processes that deal with (i) the execution of marketing and communication activities and their impact on consumers; (ii) the development of tools that enable fashion entities to implement such activities; and (iii) their implications on society.

3.1.1. C&M: Practices

This includes research that discusses the development of communication and marketing strategies in the digital era involving all interested stakeholders, which contribute to the fashion system. As above discussed, the fashion industry is experiencing a time of change. From the beginning of the digitalisation, new practices in the marketing and communication field are emerging (Crepax, 2018). Concepts such as "mediatization" are introduced to analyse the relation between digital media and fashion (Rocamora, 2017).

Research to understand what consumers expect from technological advances in fashion and their acceptance of new technologies such as 3D fashion products is conducted (Agarwal, 2019). Studies that analyse how brands are dealing with the challenge of creating a truly omnichannel strategy and how they are improving and implementing their in-store experience by introducing digital features are carried out (Perry et al., 2019; Rey-García et al., 2018).

In such a complex environment, due to the information overload and to the presence of alternative and innovative digital communication channels, such as blogs, and social media sites, which are shaping the ways in which the fashion industry communicates,

attracting and maintaining consumers' attention is essential (Kristensen & Christensen, 2017). Therefore, a vast stream of this subcategory focuses on the marketing and communication strategies adopted for engagement purposes. On one hand, it discusses how brands utilize the channels to engage consumers through techniques such as story-telling (González Romo et al., 2017), on the other hand, how consumers utilize digital platforms to engage with brands (Siddiqui et al., 2019). Furthermore, a vast stream of research focuses on social media platforms, their evolution and development (Stankeviciute, 2013), their impact on fashion (Sand, 2019), their potential in building relationships with consumers through communication and influence strategies, for example, through electronic word-of-mouth, user-generated content or key opinion leaders (Cheung et al., 2019; Lascity, 2019).

Researches on Corporate Social Responsibility, crisis communication and institutional legitimacy are also discussed within the subcategory (Petkova, 2018; Sádaba et al., 2019). Particular attention is given to practices such as sustainability in the fashion sector: consumers are increasingly demanding, resulting in a societal change of increased consumption, which is creating negative impacts on social and environmental factors (James & Montgomery, 2017). A relatively new stream of research focuses on the way in which technologies can be utilized to develop an inclusive and sustainable approach in the fashion industry and generate awareness of sustainability issues and ethical behaviour (Creangă, 2019; Moody et al., 2018). The papers discuss the strategies fashion brands are adopting for communication and marketing purposes towards sustainability, such as how corporate social responsibility is communicated to engage both consumers and stakeholders, how keywords regarding sustainability are utilized on fashion brands websites (Candeloro, 2019) and how consumers are embracing sustainability. Moreover, the negative effects of overusing sustainability claims for marketing purposes are also analysed, such as the risk of creating mistrust among consumers (Riesgo, 2019).

3.1.2. C&M: Enabling tools

This subcategory includes the development of systems, methods and models to support and facilitate the shopping experience with solutions, which involve the use of visual and

textual cues (Tautkute et al., 2019), improve product search, provide personalized recommendations by using both objective (colour, brands) and subjective cues to enhance product relevance (Saha et al., 2018).

On one side, it discusses issues such as the development of avatars and virtual fittings for consumers to better understand whether a product fits (Muta et al., 2018; Polke & Kumari, 2018). It includes studies related to the development of fashion image retrieval systems with the aim of assisting consumers in the purchasing process and overcoming the product overload issue of e-commerce through the exploitation of data and learning techniques and through systems that are as accurate as human operators (Gajic & Baldrich, 2018; Saha et al., 2018). On the other side, obtained data help to address issues related to forecasting and trend detection methods, such as colour forecasting methods, to identify consumers' preferences in multi-channel marketing through data mining (Tao et al., 2019). In this sense, the implementation of parsing of fashion images is widely addressed to predict and detect styles, to harmonize colour combinations of outfits, clothing category prediction and classification (Khurana et al., 2018; Wang et al., 2018).

Recommendation systems and methods to personalize clothing are also included in this subcategory, in fact, these systems are meant to develop collaborative filtering to predict user preferences online, when data from purchase history are lacking, as well as content-based filtering, to support consumers' decision-making process, improve the customer experience and increase sales (Ramampiaro et al., 2019).

3.1.3. C&M: Societal implications

This subcategory discusses the impact of communication technologies as an instrument to analyse a specific element of society and how it interplays with fashion. As stated by Crewe (2013) material and virtual fashion are interconnected social realities that cooperate to create mutual connections, such as the effects that different communication technologies are having on individuals and communities or the shape and construction of identity through different social media platforms (Rocamora, 2015). This subcategory, even though it does not include a wide number of papers, is considered as separate from the others, because it is believed that fashion through the interaction and the interplay with

communication technologies can have an important role to study and shape society, individuals' identity and behaviours (Neri, 2019).

3.2. Category D&P – Design and production

The category *Design and Production* intended in its broad meaning refers to the (i) creation and (ii) implementation of elements/processes, tangible and intangible, which are devised by humans or machines and contribute to the advancement of the fashion industry.

3.2.1. D&P: Product development

The term "product development" refers to the implementation of strategies, models and methods, which improve and facilitate the design of products and elements within the fashion environment. It concerns the automatization and digitalization of practices and processes involved in the development of products. The term "product" applies both to tangible items such as garments, make-up and jewellery and to intangible ones such as systems and databases, which contribute to the creation of tangible products.

This subcategory discusses the implementation of tools that automate and enhance the design process, the development of practices derived from the adoption of big data and networks and it includes research that develops systems for an efficient retrieval of visual information from images (Kuswanto et al., 2018; Liu et al., 2019).

3.2.2. D&P: Process and technology implementation

This subcategory refers to the development of procedures and decision-making strategies, which aim to simplify business processes and solve technical issues by exploiting knowledge management as a resource in fashion organizations. The main focus of this subcategory is redesigning business efforts with innovative strategies and improved decision-making processes through effective and efficient structured work- flows (Yu et al., 2011). For example, it discusses forecasting models and systems (Choi et al., 2011), the development of digital manufacturing technologies (Sun & Zhao, 2017), resource planning development (Siswanto & Maulida, 2014), and E-HRM systems (Ma, 2010).

3.3. Category C&S – Culture and society

This category includes the areas where digital fashion interacts with and contributes to (i) culture; (ii) education; and (iii) societal development.

3.3.1. C&S: Culture

This subcategory includes a number of topics that relate to fashion history, culture, religion and art in the digital era. It includes papers that provide an overview of a country's fashion industry (Aziz et al., 2019) and the impact of digital fashion on religion (Andriana, 2019), ways of preserving fashion art (Luchev et al., 2013), ethical aspects of digital innovation, the impact of consumption, fast-fashion and the need to create major awareness of sustainability among consumers are discussed (Collins, 2019).

3.3.2. C&S: Education

This subcategory is dedicated to those researches whose aim is to share, analyse and improve teaching methods in order to help students and academics in their duties. It focuses on the development of skills within schools, academies and other institutions (Lenoir, 2019).

3.3.3. C&S: Society

This subcategory broadly refers to all those studies that consider how the whole digital fashion environment can shape our society. Although it is a small subcategory, it is considered as a standalone one as it focuses on the application of the Internet of Things and its effects on society. For example, it discusses the impact of wearables, their integration in consumers' everyday life and their connection with societal issues such as safety and surveillance (Harris, 2008).

4. Discussion, limitations and further research

The present study is the first step towards a comprehensive classification of the digital fashion domain, contributing to the development of a more effective strategic research

communication among the different communities and groups of interest that contribute to building the fashion environment – both in the academy and within the industry at large.

This study demonstrates that digital fashion is increasingly attracting the interest of both academics and practitioners, in particular when referring to the category *Communication and Marketing*. This interest is expected to have a further growth, as for example, the subcategory *C&M: Societal Implications* is still under researched and needs further investigation. This subcategory is expected to expand due to the increasing interaction of fashion with digital media to shape society, individuals' identity and human behaviors (Dhaoui, 2014; Gibson, 2015; Kim & Yoon, 2014; Neri, 2019).

Furthermore, the *C&M* category is expected to produce further implications also with the other two categories that compose the digital fashion field: *D&P – Design and Production*, and *C&S – Culture and Society*. From one side, it is anticipated that the categories *C&M* and *D&P* will interplay due to the increasing trends related to the production such as online fashion shows, on the other *C&M* is also expected to have an increase in the development of a relation with the category *C&S* due to the merging of marketing and communication with topics related to education and to the upcoming interest in cultural and societal trends. As an example, how online fashion communication and marketing can advance customer experiences through, for example, personalization, localisation and e-touch (Nobile & Kalbaska, 2020; Noris et al., 2020; Ornati & Cantoni, 2020).

Nevertheless, the research has some limitations: first of all, the categorization has been realised considering each identified main topic as mutually exclusive. Therefore, future studies could consider this issue in order to further develop the categorization while also examining the implications and the relations among the different layers. This could enable to suggest a more elaborated ontology of the field. Furthermore, the search of bibliographic items could be expanded to other databases and they could conclude the collection of data of the full year 2019 and beyond, in order to keep track of how the digital fashion field advances. Another aspect to be further considered and possibly improved is related to the selected language and keywords, which might be extended to include further languages and more keywords such as "wearable fashion", "virtual fashion", and "smart

fashion". Automatic content analysis tools could be used, in order to validate/improve the current categorisation or to propose new ones.

Additionally, future research could further study the bibliographic items retrieved by analysing the research methods adopted by the scholars. This could be valuable to identify which methods are mostly used by studies in different (sub)categories, most appropriate to advance fashion research and to reach insightful findings.

Finally, due to the Covid19 spread, the lockdown, the closure of the borders and the social distancing have emphasized the necessity of digitalization across all the fashion value chain since it appears evident that potential customers will continue to increase the demand in this space and fashion companies need to be ready to satisfy this demand (McKinsey, 2020).

A further increase in research related to the digital environment with a particular focus on marketing and communication issues and cultural aspects could be expected.

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5.1.2 A review of digital fashion research: before and beyond communication and marketing

Published Manuscript:

Nobile, T.H., Noris, A., Kalbaska N. & Cantoni, L. (2021). A review of digital fashion research: before and beyond communication and marketing, International Journal of Fashion Design, Technology and Education, 14(3), 293-301. https://doi.org/10.1080/17543266.2021.1931476

Abstract

This paper focuses on the field of digital fashion and its development by providing an overview regarding fashion design and culture. It is part of a larger research that involved a literature review of 491 relevant papers. From the analysis of this corpus, three main categories were identified: Communication and Marketing, Design and Production and Culture and Society. This study focuses on the categories Design and Production and Culture and Society, which collectively gathered indicatively 48% of the selected literature. It presents its relevant studies and sub-categories, providing a rich and varied map of them and contributing to better design in further research in digital fashion.

Keywords

Digital fashion; fashion design; fashion production; fashion culture; fashion society; fashion technology

1. Introduction

Fashion interacts with many different sectors, including culture, entertainment, finance, and information Communication Technologies (ICTs). As a result of this, it has an increasing societal impact; for instance, during the Covid19 pandemic, many fashion companies contributed to the cause by extending their productions to face masks and hand sanitisers. Furthermore, fashion groups made donations to hospitals and not-for-profit organisations to support local communities around the world (Mckinsey, 2020). The pandemic has also emphasised the key role of fashion as a driver of digital transformation. Throughout history, technological advancements have shaped the nature of fashion: the first industrial revolution contributed to the mechanisation of fashion manufacture by exploiting water and steam power, the second revolution accelerated fashion production through the invention of electricity; the third one impacted the use of electronics and information technology within the fashion environment. The fourth, the so-called Industry 4.0, contributes to shape the fashion industry through an advancement of digital technologies, such as cyber-physical spaces, Internet of Things, computing tools, personalisation, localisation, and digitalisation of fashion heritage (Kalbaska, Sadaba, & Cantoni, 2018; Nobile & Kalbaska, 2020; Noris, SanMiguel, & Cantoni, 2020; Permatasari & Cantoni, 2019; Wang & Ha-Brookshire, 2018).

The digital transformation has impacted all the facets of fashion. First of all, fashion communication and marketing, through the adoption of digital tools creates a fertile ground for the improvement of business and customer relationships (Noris, Nobile, Kalbaska, & Cantoni, 2021). It had also an impact on fashion design and production, for proposing advancements in areas related to sustainable manufacturing and to the improvement of decision-making processes and HRM systems (James, Roberts, & Kuznia, 2016; Ma, 2010; McQuillan, 2020; Yu, Choi, Hui, & Ho, 2011). It also influenced culture and society, impacting education and human being's everyday life (Chun, 2011; Ebling, 2016; Harris, 2008; Ryan, 2020).

While the areas of fashion communication and of its digital transformation are emerging ones, as it appears clear also from the brief outline above, research on them still requires to be recognised and framed in a consistent way, to yield to a better understanding of the

field and to open up to new and better linked research avenues (Cantoni et al., 2020; Lascity, 2021).

To move towards this direction, a corpus of 491 papers were collected through a systematic literature review. From the analysis, three main categories emerged. The category Marketing and Communication (C&M) contributed highest number of publications (255), hence it was explored separately (Noris et al., 2021). However, to provide a complete overview of all categories a dedicated and in-depth study was developed on Design and Production (D&P) and Culture and Society (C&S), as they occupied nearly half of the studies (236 publications).

2. Literature review

To present the current status of the digital fashion research domain, a literature review was conducted as it is considered an appropriate way to identify the state of the art of a topic and areas of further research (Snyder, 2019).

In July 2019 a systematic literature review of the digital fashion domain was conducted. Five databases were investigated, using the keywords 'fashion' and 'digital' – namely IEEE, ACM, Eric, Springer Link and Scopus – for 1950–2019. The search produced 910 results and 491 of these items were considered relevant for analysis. From the systematic literature review, a classification of the digital fashion field in three categories was reached (Figure 1): (i) Communication and Marketing – C&M, which resulted in the highest number of items (255 items), followed by (ii) Design and Production – D&P (155 items), and (iii) Culture and Society – C&S (81 items). For each category, sub-categories were identified. The category Communication and Marketing was further developed in the sub-categories C&M: Practice, C&M: Enabling Tools and C&M: Societal Implications; the category Design and Production in D&P: Process and Technology Implementation and D&P: Product Development; the category Culture and Society in C&S: Culture, C&S: Education, and C&S: Society.

While it was clear that the category Communication and Marketing – C&M included the largest number of published research (51.9% of the relevant documents), covered in Noris

et al. (2021). The remaining two categories collected respectively 31.6% and 16.5% of the research literature on digital fashion.

Besides such quantitative balance between the first and the other two categories, it was observed that existing studies might be also organised qualitatively, according to a (chrono)logical framework. Design and Production – D&P refers to what happens before an item can be communicated and marketed, be it a physical/digital product or a brand, while Culture and Society – C&S refers to the overall context within which fashion acquires its meaning and relevance.

Hence, this study extended and completed the analysis provided by Noris et al. (2021) on its selected bibliographic items, contributing to the advancement of digital fashion research by conducting a literature review of the categories Design and Production – D&P and Culture and Society – C&S.

3. Results

3.1. Category design and production – D&P

The category D&P refers to 'the (i) creation and (ii) implementation of elements/processes, tangible and intangible, which are devised by humans or machines and contribute to the advancement of the fashion industry' (Noris et al., 2021, p. 5).

The following sections discuss the sub-categories by providing explanatory examples from the studied literature.

3.1.1. D&P: product development

As the term 'product development' implies, this sub-category concerns the development of methods that sup- port the design of products in fashion. The term 'product' refers to tangible and intangible fashion items.

This sub-category discusses novel and advanced methods for developing and implementing tools that automate and enhance the design process, including technologies that advance sketching and drawing thorough computer vision techniques and aided design systems such as 3D models and CAD. For example, the potential of disruptive

technologies, to design and produce unique fashion items, was studied by Pasricha and Greeninger (2018).

Categories	# of items	Subcategories
C&M – Communication and Marketing	255	C&M: Practices (#119) C&M: Enabling Tools (#109) C&M: Societal Implications (#27)
D&P – Design and Production	155	D&P: Process and Technology Implementation (#95) D&P: Product Development (#60)
C&S – Culture and Society	81	C&S: Culture (#53) C&S: Education (#22) C&S: Society (#6)
Total	491	

Figure 1. Categories of published research on digital fashion. Source: Noris et al. (2021, p. 6).

It also addresses the development of practices derived from the adoption of big data and networks, such as generative adversarial learning and genetic programming that contribute to product creation, including pat- terns such as fractal patterns, colour forecasting and the generation of various textures. Additionally, it includes research that develops systems for an efficient retrieval of visual information from images and photographs (Dai, 2011; Dongdong, 2012; Gu & Liu, 2010; Kharbanda & Bajaj, 2013; Kuswanto, Iftira, & Hapinesa, 2018; Lee, Lim, Jung, & Park, 2015; Li, Lu, Geng, & Wang, 2009; Liu, Zeng, Tao, & Bruniaux, 2019; Long, Li, & Luo, 2009; Muni, Pal, & Das, 2006). This sub-category presents novel and effective technologies that enable, for example, product customisation or support sustainable fashion (Pasricha & Greeninger, 2018; Wang, Zeng, Koehl, & Chen, 2014). Finally, it introduces technologies that maximise the emotional experience of fashion products through sensors and wearables (Tillotson, 2008; Wakita et al., 2005).

3.1.2. D&P: process and technology implementation

This sub-category discusses the way in which technology advances simplify and enhance the efficiency and effectiveness of the decision-making processes within the fashion industry (Yu et al., 2011). The aim is to enhance operational efficiency, improve products' life cycle (Lee, 2017), ensure high level performance, reduce lead time and minimise the risks through advanced methods such as radio-frequency identification, warehouse

management, inventory control and real-time replenishment (Bertolini, Rizzi, Romagnoli, & Volpi, 2017; Bindi et al., 2018; Buckel & Thiesse, 2014; Chen, Luo, & Zhu, 2010; Hauser, Günther, Flath, & Thiesse, 2019; Leitz, Solti, Weinhard, & Mendling, 2018; Pedrielli et al., 2016; Shen, Ding, Wang, & Ren, 2019). It also investigates the development of forecasting models and systems dedicated, which predict the time series sales data of fashion items (Choi, Hui, & Yu, 2011) or find the best pricing for sales (Bruzzone, Longo, Nicoletti, Chiurco, & Bartolucci, 2013; Yu-Chung, 2010).

In addition, the development of digital manufacturing technologies, such as printing methods (Sun & Zhao, 2017) or knitting method technologies (Taylor & Townsend, 2014), which could be adopted to simplify and increment companies' efficiency, is described. Another stream relates to operations, discussing topics, such as resource planning (ERP) development (Siswanto & Maulida, 2016), service quality model advancement (Chan, Choi, & Man, 2016; Choi, Chow, Shen, & Wan, 2017) and the implementation of innovative robotic technologies to reach higher levels of flexibility (Xu & Lai, 2011).

Within the sub-category, particular attention is given to the improvement and analysis of supply-chain models and strategies tackling issues such as market fluctuation (Zhou & Shu, 2010), agility (Verma, Jain, & Majumdar, 2013), production planning and control (Fani, Bandinelli, & Rinaldi, 2017), or new product development (NPD) models (Takamitsu & Gobbo Junior, 2019). Performance evaluation within the fashion supply chain to increase the level of competitiveness of the company is also considered (D'Avolio, Bandinelli, & Rinaldi, 2017). Technology and data advances enable the implementation of supply chain systems. For example, the availability of large quantities of data – even of 'big' ones – allows the fashion industry to better map its supply chains, and, eventually, to ensure more sustainable ones. This sub-category also includes a series of studies aimed at developing more efficient business models, taking into account specific case studies in the field.

Additionally, it reviewed updated methods of managing human capital, including the development of E- HRM systems (Ma, 2010), the possible contribution of technology for HR practices, such as well-being, social volunteering initiatives and female

entrepreneurial activities (Trequattrini, Manfredi, Lardo, & Cuozzo, 2019). It addressed the possibilities brought by the integration of technology and human knowledge (Fan & Qiao, 2010) and its impact on the digital skills, and competencies required by fashion companies. For example, skills to utilise communication technologies (Kalbaska & Cantoni, 2019), skills needed for effective decision- making, such as the ability to source and select appropriate materials, or the ways in which technology can be of use to develop competences and support less experienced designers (Oliveira & Cunha, 2019).

3.2. Category culture and society – C&S

This category included the fields where digital fashion interacts with and contributes to the development of (i) cultures; (ii) education; and (iii) society.

3.2.1. C&S: culture

The sub-category is composed of a number of subjects that according to the literature review dealt with themes such as fashion culture and heritage, history, customs and tradition, religion, art and performances in the digital era.

It showed how fashion digital transformation is related to religion and customs and traditions; some examples are related to the importance to consider the contribution of digitalisation on the spread of local trends connected to religion, such as modest fashion, to a more globalised fashion environment or it directly refers to the use of religious customs and their impact within the fashion field, for example by utilising digital printed Muslim motifs (Andriana, 2019; Indarti & Peng, 2017). Furthermore, it considered and provided different perspectives proposed on the new ways of preserving fashion as a form of art and heritage for communities (Luchev, Paneva-Marinova, Pavlova-Draganova, & Pavlov, 2013), including the digitalisation of archives for cataloguing collections not only for marketing exploitation but also for cultural dissemination (Martin & Ko, 2011; Takahashi, 2013).

Archives are crucial to protect past designs for the use of designers and the preservation of heritage (Ram, 2015; Takahashi, 2015). This category included papers that discuss the use of innovative and interactive technologies, which improve consumers' experiences

and enjoyment at museums and installations (Marfia, Tolic, Mascio, Matteucci, & Roccetti, 2015; Martin & Mauriello, 2013). It also encompassed research that offers overviews of country-specific or geographic- specific areas such as the African continent and their relation to fashion or the Japanese fashion, dress and behaviour (Aziz, Salloum, & Alexandre-Leclair, 2019; Takahashi, 2011). A smaller stream discusses the ethical aspects of digital innovation, such as the issue of data ownership of wearable technologies (Baker, 2017), ethical issues regarding counterfeiting (Pastore & Cesareo, 2015) and the impact of fast-fashion consumption on the surrounding environment, to create a stronger sense of awareness when it comes to sustainable issues among the different fashion stakeholders (Collins, 2019; Perrottet & Nicoletti, 2018; Schor, 2013).

3.2.2. C&S: education

The current sub-category consists of those studies whose goal was to share, examine and further enhance teaching and research strategies to contribute to the development of the field also through an academic and educational perspective. It considered the development of skills and competences within educational institutions derived from all the other sub-categorisations; for instance, the improvement of e-design, communication and marketing and technical skills for the production, the placement and development of fashion products and of the field (Avella, 2018; Lenoir, 2019; Peppler & Glosson, 2013). Specifically, it discussed the improvement of technologies and methods, such as neuroeducation, which support students' learning process through new methods and strategies such as computer-aided instruction and 3D printing (Cheng, Liu, & Lin, 2015; Choi, 2012; Coelho Lima Júnior & Zuanon, 2019; Kwon, Lee, & Kim, 2017; Wiana, 2018) and it also discussed challenges faced by educators while engaging fashion students in sustainability development and introducing new pedagogical marketing and communication strategies and perspectives (Joyner, Connell, Lang, Ruppert-Stroescu, & LeHew, 2016; Lenoir, 2019).

3.3.3. C&S: society

The last sub-category makes reference to research and studies that presented and took into consideration how the whole digital fashion system can interact with our society. Although this category is smaller than the others, it has been evaluated as a standalone one since it proposes studies that consider the effects of digital fashion on society. Examples are related to the use of fashion Internet of Things and its effects on society or the impact of wearables, their integration in consumers' everyday life and their connection with societal issues such as safety and surveillance (Ebling, 2016; Harris, 2008; Lamontagne, 2014). In this sub-category, the collaboration of fashion stakeholders with external ones was discussed and it contributed to the creation of inter- disciplinary studies and to societal development through fashion.

4. Conclusion and limitations

From this study it was identified that there is a substantial pool of research covering the topics related to the Design and Production and Culture and Society. Even though research on Communication and Marketing is the most prolific one, research in the fashion domain is expanding to other topics. For instance, the category Design and Production – D&P demonstrates the increased interest of the research field on how manual processes are replaced by digital ones: manual processes of extracting colour palettes have been substituted by automatic ones (Lai & Westland, 2020), or the role and perception of designers and managers regarding sustainable issues, life-cycle, and the effects of digitalisation for pollution (DeLong, Casto, Min, & Lee, 2016).

The category Culture and Society – C&S shows instead the impact of fashion on society due to its strong cultural presence (Choi & Lewis, 2018) and it presents topics such as the role of educators in teaching new strategies to designers, to contribute to solve, for instance, sustainable issues (DeLong et al., 2016), to develop the fashion field and to increase its impact on the surrounding environment.

Technology advances are impacting the fashion industry as a whole. This emerges from the studies which cover a great number of topics and highlight the changes that are

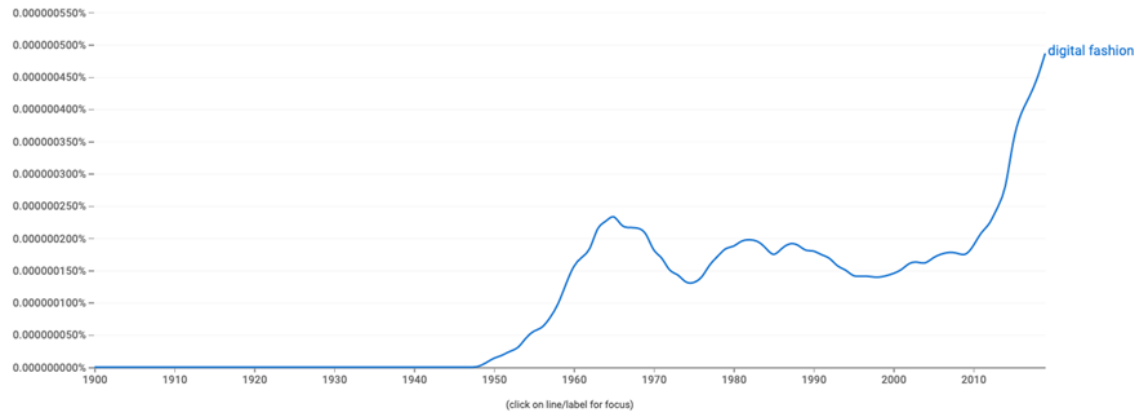
occurring in the fashion industry. The fashion industry is benefiting from such advances in multiple ways.

From the current literature review the following definition of digital fashion is suggested: Digital fashion involves all those processes that include (i) marketing and communicating tangible and intangible products; (ii) the development and implementation of processes that support the advancement of the industry; (iii) the effects of digital advances on society.

From this study, it emerges that the field of digital fashion could benefit from further research. As shown by Figure 2, the interest in digital fashion is growing.

Additionally, the recent pandemic has accelerated the digitisation process of fashion. However, it also rep- resents a challenge, as it involves many changes for the industry which needs to adapt to the new technologies and also their impacts on society. This research has some limitations. In particular, it considered only those studies that were conducted and published before July 2019. The pandemic of Covid19 could have accelerated the process of digital transformation of companies and increased the interest in developing new research studies and studies within the field. New research topics within the sub-categories could then have emerged since the collection of the data on which this study is based. Future research could advance the field by analysing more in-depth effects of emerging technologies on society, for example the effects of artificial intelligence, 3D printing technologies, phygitalisation and haptic technologies.

Figure 2. Ngram Viewer: digital fashion (1900-2019).



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5.1.3 Digital fashion competences: a longitudinal study

Published manuscript:

Nobile, T.H., Kalbaska, N., de Oliveira, R.A. & Cantoni, L. (2021). Digital Fashion Competences: A Longitudinal Study. In: Sádaba T., Kalbaska N., Cominelli F., Cantoni L., Torregrosa Puig M. (eds) Fashion Communication. Springer, Cham, pp. 17-28. https://link.springer.com/chapter/10.1007/978-3-030-81321-5_2

Abstract. The fashion field is undergoing a period of digital transformation, further accelerated by the Covid19 pandemic. The evolution of digital fashion foresees a change in the required skills and competences, which should be mastered by employees of the sector. Moreover, the dynamicity of digital fashion also implies the need to constantly update academic curricula, which should be able to form the employees who will be entering the digital fashion job market.

The research objectives of this study are twofold. Firstly, research the skills and competences needed in the current digital fashion market in order to identify whether there are any salient differences from a similar study conducted in 2017 by Kalbaska and Cantoni (Business models and ICT technologies for the fashion supply Chain. IT4Fashion 2017. Lecture notes in electrical engineering. Cham: Springer, 2019). Secondly, conduct such analysis during the Covid19 pandemic, a unique period for the job market, which has experienced major cuts also in human resources, while at the same time a dramatic increase of digital activities has been seen (e.g., eCommerce). To reach such goals, a study has been conducted on LinkedIn, a professional social network, from May 19, 2020, to June 2, 2020, to identify the number and the type of job listings, and the most required skills in the digital fashion domain in the EU and Switzerland.

Keywords: Digital Fashion, Digital Transformation, Skills and Competences, Fashion Curricula.

1. Introduction

The fashion industry is being impacted by technology advances. Digitalization is transforming the whole industry, from the way in which products are being produced to the communication between retailers and consumers and individuals' shopping habits [1]. Hence, digitalization implies the need to conduct further research on the entire ecosystem of the fashion field [2–4].

Fashion should be about innovations and trends, yet fashion brands have not been at the forefront of digital innovations, with the exception of few disruptive fashion brands [4]. However, the Covid19 pandemic has strongly affected the fashion industry and accelerated the digital transformation that companies have been reluctant to embrace. Due to social distancing, digital channels have gained high importance, and fashion companies have had to drastically rethink their business, embrace new channels, and respond to consumers' changing habits by identifying alternative solutions to the existing ways of operating [5].

To survive this crisis, companies will need to adapt quickly. The digital capabilities will continue to impact individuals' daily lives; hence companies are required to strengthen their digital potential as when this crisis will be over, the fashion industry will have to continue facing a time of changes. To face such complex time, fashion companies must be ready to strategically redefine their business model across the whole value chain. To do so, companies must have a workforce with the appropriate skills and competences to embrace the digital transformation [6].

Additionally, recent studies are acknowledging the lack of integration between students' learning in higher education and the job market. To fill this gap and to form the employees of the future, academic curricula that take into consideration the evolving industry requirements are necessary [7, 8]. Graduates are entering an extremely difficult and unpredictable job market. Moreover, due to the reduction of internships and new/entry level jobs, the competition to find a job opportunity is high. Therefore, equipping them with the relevant skills is crucial.

This study aims to gain a comprehensive overview of the skills and competences needed in the current digital fashion environment and identify how the digital fashion job market is changing through a longitudinal study. To do so, it continues the study by Kalbaska and Cantoni [9], who researched the digital fashion domain in 2017. Details regarding the way in which the study was conducted are discussed in the methodology section. The longitudinal approach is expected to provide insightful conclusions on whether there are any changes from the year 2017 to the year 2020 in which this study has been carried out. Moreover, this study is executed during a unique period, when the whole world is facing a pandemic, adding one more reason of interest to it.

2. Literature Review

Digitalization is having a big impact on the fashion industry. This process is altering and advancing fashion business models and formats, the channels utilized to communicate with consumers, and the customer journey touchpoints [10]. Indeed, fashion is shown to be a rich field and its interplay with Information and Communication Technologies (ICTs) and digital media happens on different levels. Digitalization is impacting not only the design and production processes adopted by fashion firms but also the way in which retailers communicate with consumers and market their products. These changes are having an impact on the whole society, including education.

The growing importance of digital fashion is also supported by scholars' interest in the digital fashion domain and an increased number of publications on digital fashion from the 1950s till 2019 [1].

This study aims to contribute to the ongoing research in the context of fashion transformation by discussing the impact of digitalization on the job skills and competences required by the industry. Additionally, it addresses the importance of identifying the relevance of skills and competences also for the development of academic curricula.

2.1 Digitalization: job skills and competences

The digital transformation of a business involves a deep transformation of its activities, processes and competences [11]. Adapting to the digital changes and integrating a new technology within a business involve both possibilities and challenges. To face such

complexity, retailers need on one hand advanced IT infrastructures to conduct their activities and to provide the services to consumers and on the other hand they must have employees with the appropriate skills and competences to implement these innovations within the business [12-13].

Skills are a specialized knowledge that enable the creation of products/services and the manipulation of processes and people [11]. Due to digital advances, the routine jobs are increasingly being performed by robots. Employees should focus on developing those skills necessary for nonroutine jobs. The literature has identified some generic skills, which are crucial for completing various tasks in the digital context, including information, communication, collaboration, critical thinking, creativity, and problem-solving skills [14]. Similar skills are also identified to be relevant in the fashion field in the study by Kalbaska and Cantoni [9]. Indeed, the communication skills are among the top skills also for fashion employees [9]. Communication digital skills are defined by van Laar et al. [14: 94] as the ability "to transmit information online and reflect upon the best way to present this information to a particular audience" and they can be of various types. Fashion firms utilize different types of digital media to interact with consumers. Hence, the communication skills of content sharing and creation are important. ICTs provide employees with innovative solutions to do so creatively, which is essential in such a competitive market [1-15, 16]. Furthermore, the categories identified by van Laar et al. [14] of problem-solving skills and critical-thinking skills, which involve the ability of analysing a problem and making informed decisions based on evidences are also crucial within the digital fashion domain, reflected in the data related skills such as web analytics and analytical skills identified by Kalbaska and Cantoni [9].

The rapid evolution of technologies implies that the skills and competences across the whole supply chain should be constantly updated [12]. To date, however, research has paid limited attention to the skills needed by employees in the digital fashion environment [2]: hence, this research aims to address this gap.

2.2 Digitalization: fashion curricula

Research on the skills and competences in digital fashion is expected to be relevant also for the development of academic curricula that take into consideration the integration of fashion with ICTs [1–9, 13]. University programs sometimes are criticized for being irrelevant for the market needs and not being able to prepare students for the relevant job markets. Traditional teaching methods, which focus on developing students' academic skills, are definitely important; yet they do not always fully prepare students for the job market [16].

Since the beginning of the twenty-first century, the integration of technologies within learning has become object of study. Graduates need to be equipped with relevant digital skills to enter the job market. Hence, an active use of technologies within the educational journey, such as mobile applications, augmented reality, and social media channels, can be crucial to prepare students to the complexities of the job market [17]. For example, within the fashion field, the study by Son et al. [18] has developed an interactive learning curriculum for the apparel design and merchandising subject using social media channels. Some of the positive aspects derived from the integration of such channels in the curriculum are higher understanding of the topics, enhanced critical thinking, application of knowledge, and technology skills.

The Covid19 pandemic, which forced many classes to be conducted partially or fully online due to social distancing regulations, stressed the importance of students' curricula that are able to satisfy the evolving market needs. Curricula should be re- evaluated to be relevant for students' post-graduation [19]. Research on digital fashion curricula is still limited to our knowledge, while it is one of the key research topics and key emerging trends identified and presented in the Fashion Communication research Manifesto, developed during FACTUM 19 Conference [2]. More- over, as mentioned above, the fashion industry is rapidly changing. Hence, this study aims to address the lack of research in digital fashion curricula by providing an analysis of the job roles and skills currently required in digital fashion and that should be integrated in the fashion curricula.

The following section provides details regarding the methodology adopted in order to collect the data.

3. Methodology

For the purpose of this study, a longitudinal research was chosen. In this type of research, data is collected from one or more variables of the same object of study for two or more periods. Thus, it is possible to compare the results of the different periods, identifying the main changes occurred and the possible causes [20].

Job postings related to the digital fashion market were collected on LinkedIn. The social network serves as a worldwide job market with its 675 million members [21] and no other social network for professionals has had the same impact [22]. Job vacancies posted on LinkedIn receive more potential candidates than on networks like Facebook or Twitter together [23], making it a worldwide known platform for increasing employability [22]. The nature of LinkedIn makes it possible for recruiters to identify potential talents and attract them to job openings. As a social network, the access to a large number of professionals in real-time makes LinkedIn widely used by companies and Human Resources professionals to increase the quality of their selection processes [23-24].

For data collection, an automated web scraping tool called WebHarvy was used. The web scraping tool collects unstructured data available on websites, transforming it into a structured and manageable database [25-26]. Websites can be described as content pages in digital format, composed of data such as texts, videos, and photos [27]. Websites usually have similar templates to each other, disseminating information similarly in the architecture of each page. Thus, the web scraping tool collects the selected information from a specific page and replicates the process to the other pages, creating an organized database [28].

The web scraping tool was used from 19.05.2020 to 02.06.2020. The steps for conducting data collection and standardizing the analysis followed the methodology described by Kalbaska and Cantoni [9]. For each job posting, the following data were collected: job title, company name, location, publication date of the advertisement, job description, and the industry the job belongs to. Posts from 29 countries (European Union and Switzerland) in English were selected. Besides, the search was limited to the following industries:

Apparel and Fashion, Internet, Luxury Goods and Jewellery, Marketing and Advertising, Retail, Textile and Design.

The following keywords were used for the search of the postings: 3D, Augmented Reality, CRM, Digital Communication, Digital Content, Digital Fashion, Digital Marketing, Digital Media, Digital Transformation, eCommerce, eLearning, Fashion IT, Forecasting, Influencer Marketing, Localization, Personalization, SEO/SEM, Social Media, Trade Marketing, Usability, User Experience, Visual Merchandising, Web Analytics. From these filters, data from 10'116 job postings was collected.

In the data-cleaning phase, job postings that did not contain the word "fashion" in the job title or in the job description were removed. Moreover, duplicate job postings were eliminated. Subsequently, job postings with the word "fashion" only in the job description were manually analysed for relevancy.

Following the data-cleaning phase, the final database consisted of 1397 job postings. Quantitative content analysis of job titles and job descriptions was performed using WordSmith Tool 6.

4. Results and discussion

The presentation and discussion of results is structured as following: firstly, it discusses the job positions which emerged in digital fashion, then it analyses the job titles and descriptions to identify the relevant competences and skills. In order to identify whether there are any evolutions in the digital fashion job market and the impact of Covid19 on the market, the data is compared with the set of data of 2017 by Kalbaska and Cantoni [9].

4.1 Job positions in digital fashion

The number of job positions identified in this study is 1397 (Table 1), compared to 1427 in 2017. Despite the apparent small decrease in the number of listings in 2020, it should be considered that the collection of the data set was conducted between the end of May and beginning of June (19.05.2020 to 02.06.2020). A period when the whole world was being affected by the Covid19 pandemic and most countries were experiencing the first lockdown and its drastic consequences on the global economy. Arguably, considering the market situation, the number of job listings identified in 2020 is high and it symbolizes

the growing importance of digital fashion within the job market, suggesting that fashion companies were intensifying their online activities also encouraged by the social distancing requirements imposed by the pandemic.

The hubs of digital fashion across the years remain the United Kingdom and Germany. However, the number of countries in which job listings are identified increased between the two studies, with job listing identified in 17 countries in 2017 and in 26 countries in 2020, showing that the relevance of digital fashion is spreading across countries.

Table 1. Number of digital fashion jobs available on LinkedIn from May to June 2020

Countries	**Frequencies**
Austria	11
Belgium	34
Bulgaria	1
Croatia	1
Czech Republic	2
Denmark	12
Estonia	1
Finland	10
France	44
Germany	203
Greece	5
Hungary	6
Ireland	17
Italy	86
Lithuania	6
Luxembourg	3
Netherlands	85
Poland	17
Portugal	67
Romania	5
Slovakia	2
Slovenia	1
Spain	44
Sweden	23
Switzerland	82
United Kingdom	629
Total	1397

4.2 Job titles and skills in job descriptions

The most frequent combination of keywords found in digital fashion job titles (Table 2) were “marketing specialist” and “ecommerce specialist”. The first two positions in 2017 were occupied respectively by “digital marketing” and “social media”. Whereas, in 2020 “social media” slipped in sixth position and eCommerce roles grew of importance. Consumers’ shift to online shopping for fashion products is expected to continue growing, accelerated by the Covid19 pandemic which anticipates consumers’ increase spending on online channels [29]. Arguably, when referring to eCommerce other skills might also be implied, as other channels such as social media or voice search are also being adopted for eCommerce purposes beyond traditional websites [30-31].

Table 2. Top 20 fashion job titles

Keywords combinations	#
Marketing specialist	48
Ecommerce specialist	47
Visual associate	44
Content writer	43
Product manager	41
Social media	40
Influencer marketing	38
Customer service	30
Store manager	28
Account manager	25
Business developer	20
Graphic designer	20
Service assistance	14
Visual merchandising	13
Operations associate	13
Campaign manager	13
Sales management	8
Fashion assistant	7
Media executive	7
Digital analyst	5

The other sets of data analysed provide an overview of the combinations of the most frequent keywords in the digital fashion job descriptions (Table 3). Overall, the keywords identified across the two studies appear to be very similar, with some exceptions.

The most mentioned keyword combination is that of “luxury fashion”. This could be as the luxury sector is unique for some aspects [32], hence it requires particular attention. Whereas in the study by Kalbaska and Cantoni [9] the most mentioned skill is that of “social media”. Arguably, this result does not indicate a reduction in the importance of

social media skills but an increase in the number of other skills required in digital fashion. Moreover, another possible explanation is that for fashion firms, social media skills are now considered an essential prerequisite and therefore less relevant to highlight in job listings.

Extremely interesting is the importance of "customer service/care" skills in both sets of data. According to the literature, the role of technology in providing services is evolving as it enables to provide better services by facilitating the interaction between employees and customers [33]. Moreover, consumers interact with multiple channels and devices in their shopping activities, hence in the omnichannel retailing experience, which "is geared towards serving customers when and how they want" [15: 471], customer service skills are fundamental.

Soft skills are extremely important in fashion. Communication skills remain among the top skills needed in fashion. Digital channels have enhanced communication abilities and the possibilities to connect, yet in a market characterized by information overload, attracting consumers' attention is a major challenge, to be addressed with adequate knowledge and skills. Communication skills, both oral and written, enable effective communication among employees and with customers. Fashion firms are constantly searching for ways to connect to individuals' emotions and feelings through their communication activities. A growing trend is that of providing personalized messages to individuals through different channels in order to attract consumers' attention and build a relationship with each individual [3]. Hence, excellent communication skills that are able to reach individuals' emotions are of crucial importance [33]. In the 2017 data set, other skills that are connected to communication skills, such as the ability of creating marketing campaigns, email marketing and digital content creation emerged to be important. Interestingly, such skills were not identified among the top skills in the 2020 data set. However, traditional communication tools such as email marketing are still widely adopted by fashion retailers [34]. Arguably, as previously mentioned, even though the skills expected by digital fashion experts evolve with new technologies, it should not be concluded that traditional skills lose their relevancy. Other soft skills, such as being a team

player, being part of an international team, and also being able to work independently, solve problems and manage time are required.

In addition to soft skills, employees in fashion should also have analytical and data skills. Arguably, it is because the traditional skills of the fashion industry are being impacted by data skills. Analytical skills appear in both studies, implying that the ability of understanding, analysing and interpreting data is an essential skill. As consumer online shopping habits are expected to continue growing beyond the pandemic, brands will have access to a large amount of data. Moreover, data is impacting other skills, such as the ability of identifying fashion trends. In fact, data can have many purposes within the fashion industry, as it enables to understand consumer behaviour, make predictions, and forecast trends [35]. Hence, firms need employees able to both analyse and interpret the data in a way that can be utilized for strategic decisions in such a dynamic environment.

Finally, skills specific to different emerging technologies, such as augmented reality and 3D printing do not emerge from the studies, although in the most recent research they were inserted as keywords on LinkedIn. 3D design is an interesting method to experiment with and there is already the equipment at disposal to implement it, yet it is still at its infancy in the fashion industry [5]. However, "customer experience skills" appear to be relevant in digital fashion and retailers are relying on technological advancements such as 3D, VR, AR to develop and offer user experiences. Hence, skills relevant for new technological advances are expected to become more important in the coming years.

Table 3. Top 20 digital fashion skills and competences in job descriptions

Keywords combinations	#
Luxury fashion	737
Customer service/care	692
Communication skills	520
Written communication	494
Digital marketing	406
Team player	397
Verbal communication	377
Customer experience	338
Analytical skills / Google analytics	236
Time management	225
Visual merchandising	218
Problem solving	216
Project management	177
Work independently	156
Fashion industry	149
Management skills	142
International team	125
Flexible working	119
Paid social	102
Fashion trends	99

5. Conclusion, Limitations and Future Research

The digital fashion domain is evolving, gaining importance across countries. This study addresses the suggestion by Kalbaska and Cantoni [9] of a longitudinal study to capture the evolution of the field in terms of the skills and competences required by employees. The number of job listings has substantially remained stable from 2017 to 2020, showing that it was not highly affected by the Covid19 pandemic. Furthermore, it emerges that

employees wishing to work in the field should have a wide range of skills, from soft communication skills to operational skills. The results of the studies also imply the need to develop updated fashion curricula that consider the integration of fashion with ICTs to prepare students to the competitive and dynamic fashion job market.

It will be interesting to continue researching how the fashion job market will evolve, including the demand of digital fashion positions and the related skills. After the Covid19 pandemic, the digital fashion market is expected to continue its growth, hence further research will enable to capture its evolution in the years to come. Moreover, further research could analyse existing curricula and consider how they could be implemented to address the needs of the evolving field.

Limitations of the study should be addressed in future research. Firstly, the data was collected on a single platform LinkedIn, hence future research could consider also other platforms. Moreover, only the positions in English language were analysed. This could provide bias results in the number of job listings in other countries. Hence, future research could take into consideration job listings in other languages and other countries.

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5.2 Defining personalization

5.2.1 An exploration of personalization in digital communication. Insights in fashion

Published manuscript:

Nobile, T.H. & Kalbaska N. (2020). An Exploration of Personalization in Digital Communication. Insights in Fashion. In: Nah FH., Siau K. (eds) HCI in Business, Government and Organizations. HCII 2020. Lecture Notes in Computer Science, vol 12204, 456-473 Springer, Cham.

https://link.springer.com/chapter/10.1007/978-3-030-50341-3_35

Abstract. Developing effective personalization has become a priority for many firms. Online personalization is considered a key trend for the future of retailing. Despite the vast research and interest in online personalization by academics and practitioners, its understanding remains fragmented and there is not a comprehensive and updated definition, which is able to capture its complexity. Hence, this research aims to provide an analysis of the definitions of online personalization in order to identify elements in common and sources of discrepancies of the concept. The five key elements that are identified are offerings, knowledge, channels, purpose and contextual factors. Moreover, critical issues that hinder the development of a clear understanding of the topic are discussed, such as the overlap with the concepts of customization and perceived personalization. Subsequently, following a similar procedure, a review of the state of the art of personalization studies specific to fashion in the online context is conducted. The study also identifies directions for further research.

Keywords: Personalization · Customization · Digital fashion · Fashion communication · E-commerce

1. Introduction

The retail environment is constantly evolving due to technological advances and innovative business models. New technologies are modifying the way in which retailers connect with consumers, who increasingly search for products and information online [1, 2]. An e-tailer can offer a wider range of products compared to traditional retailers [3]. As a result, consumers are exposed to many products and a variety of information. However, such overload of choice, both in terms of products and services paired with the related information, can be extremely overwhelming for consumers' decision-making process [3, 4]. Hence, firms are increasingly looking at online personalization, the focus of this study, to overcome the issue of consumers' decision making and to reach a competitive advantage through differentiation [5]. On the one hand, personalization can enable retailers to reach the desired consumer, and on the other, it can support consumers in making informed decisions, in the most efficient and effective way. The relevancy of online personalization is supported both by academics and practitioners and it is considered an important trend for the future. It attracts interest from many academic fields such as computer science, social science and cognitive sciences [5, 6]. Personalization is also widely adopted by firms as part of their online strategies and it is important to understand the concept to support firms in the allocation of their marketing budgets [5]. Yu and Cude [7] suggest that the importance of personalization is such to impact the definition of advertising, which is attributed from the American Marketing Association the characteristic of non-personal. Hence, personalization is so important that it yields the need for re-examining elements of other notions [7].

The concept of personalization is not new, it dates back to any trade relationship [5, 8], which involves establishing a relationship between two parties, and it has been applied for centuries, predating the internet [9].

In early research, personalization was usually associated and studied with concepts of segmentation and targeting or utilized in the contexts of mass customization and one-to-one marketing [10]. The concept of one-to-one marketing, introduced as a response to the challenge of competing in a global market, is part of customer relationship management practices [10, 11]. Such solution involves customizing a product offering to fit customers'

needs. In specific, it requires two steps: establishing a one-to-one relationship and mass customization. The interaction with each customer enables to learn about this customer and others. These steps allow customizing the product, which is considered as a firm's biggest competitive advantage. Nonetheless, the successful accomplishment of such steps requires high investment in information technology to both store and analyze the data [11]. The expected benefits of one-to-one marketing and relationship management drove the interest in personalization and it is in the mid-1960s that IT started to being used in direct marketing to personalize services. Personalization is applied both offline and online, yet nowadays it generally happens on the internet [12–14]. Therefore, this paper will focus on personalization online.

The advancements in information and communication technology enabled to take online personalization to the next level [5, 7, 14]. Moreover, the availability and proliferation of big data, which firms have access to, supported the implementation of various personalization strategies. Hence, personalization in online contexts has been extensively researched to identify its benefits. For example, in social sciences, it has been studied in order to understand whether it provides positive marketing outcomes. Such expectations are supported by the following well-established theories. According to Festinger's (1954) cognitive dissonance theory, individuals are more likely to embrace information that is attitude-consistent and prefer information that aligns with their perspective [15]. Consistent with Petty and Cacioppo's (1986) elaboration likelihood model, messages that are relevant to consumers should increase their motivation to process the information [18]. Moreover, other work from psychology, such as theories on persuasion and influence principles, has been adopted to support personalization studies [16].

Even though personalization is expected to provide many benefits, there is research that shows contrasting results, not supporting this assumption [4, 17]. The effective application of big data for personalization represents a challenge and some individuals respond negatively to it [10, 12, 18–22]. For example, Yu and Cude [7] show that the most typical response to online personalized advertisement, such as emails, is that of deleting it without even opening it.

When referring to personalization, scholars address a wide range of different yet related topics. Moreover, there is not a commonly accepted terminology and definition of personalization [4, 17]. Shanahan et al. [21] suggest that in order to overcome the inconsistent results it is necessary to better understand personalization. Hence, the main aim of this study is to analyze how online personalization is defined by the academic literature to detect points in common and discrepancies. Then, an analysis of personalization in digital fashion is conducted.

2. Methodology

The identification of the definitions involved three steps. The first step was conducted to identify definitions of personalization online, whereas the second and third steps aimed at detecting studies of online personalization specific to fashion. Firstly, through a review of the literature, definitions of personalization adopted in studies focused on the online context were analyzed. From this analysis, the key features that were found to be shared by multiple definitions and the sources of inconsistencies were examined in greater detail. This enabled to extract five elements of personalization from the definitions.

Secondly, a systematic literature review on online personalization in fashion was conducted. To identify the papers relevant to online personalization in fashion the Scopus database was utilized. The keywords "web personalization fashion" OR "online personalization fashion" were inserted in the search of the article title, abstract and keywords. Both the terms "web" and "online" were inserted due to the lack of consistent terminology found in the literature. No restrictions were applied in order to gain a broad view of the existing research in the field of fashion. The search gave 60 results. However, many of the results were not relevant for the study or utilized the term "fashion" as an adjective and did not focus on the fashion industry such as in the studies of Wu et al. [24] and Raufi et al. [20], hence not considered pertinent for the fashion personalization analysis. Seven studies were considered significant for the fashion section of the paper. Lastly, an advanced search on Scopus was conducted. The keyword "personalization" was utilized to find relevant research by restricting it to the following journals, chosen based on their rankings: "Journal of Fashion Marketing and Management", "Journal of Global

Fashion Marketing", "Fashion Theory - Journal of Dress Body and Culture", "International Journal of Fashion Design", "Fashion and Textiles", "Fashion Practice". The search gave six results, five were considered relevant for analysis as one of them did not contain personalization as a keyword. Of these five, one was already identified in the second step.

3. Online Personalization: Definitions

The interdisciplinarity of personalization research results in fragmented knowledge regarding its conceptualization, as there is not a generally accepted definition of the concept. Arguably, despite the extensive research in personalization, the lack of com- mon terminology still represents one of the obstacles to fully understand the concept and all its facets [8]. Various meanings have been attributed to personalization, providing a range of different definitions. Personalization does not exist alone but as a component of an overall marketing strategy. Hence, depending on the focus of the study, different definitions are provided [9]. Moreover, some scholars do not define personalization in their study, as they assume its clarity [4, 17, 24].

During the analysis, the first issue identified was that the terms "personalization", "online personalization" or "web-personalization" were often utilized interchangeably. Recently, personalization is mostly referred to as an internet-related concept. Such use of terms creates confusion within the literature of personalization and it is challenging to contextualize personalization research in online contexts [25].

A major source of confusion identified is the overlap of personalization with other concepts. The basic idea of personalization that emerges from the definitions, on which most scholars agree upon, is that of individualization, which is achieved by considering individuals' specific preferences and is utilized as a synonym of personalization. Personalization usually starts with the elicitation of individuals' preferences and continues with a message individualized according to the specifics elicited [26, 27]. Therefore, personalization is generally considered as an umbrella term for preference matching and tailoring, as it deals with the adaptations done exclusively for individual users. It involves creating a match between a message and a recipient [5, 22, 24, 25, 28–31]. Another

concept adopted to define personalization is that of persuasion. Being exposed to a match that reflects one's interest, it is expected that the consumer will process the information with more attention and as a result the match should be more persuasive [25, 26]. Walrave et al. [13] in their study recognize personalization as the creation of persuasive messages. In defining personalization, multiple scholars highlight the process nature of the concept. According to Raufi et al. [20] "Web personalization is considered a process that consists of building models of individual user goals, preferences, and knowledge, as well as using such models throughout each interaction with users to adapt the proffered content to their preferences" (p. 2379). According to Tran [10] the element that the various definitions have in common is that of considering personalization as a process. Huang and Rust [30] and Murthi and Sarkar [32] consider it as the process of utilizing consumers' information to provide the offering. The latter summarize the process of personalization in three stages, namely learning, matching and evaluation. The first stage involves learning about consumers and their preferences through data collection, the matching phase consists of matching the offerings to consumers based on the preferences learnt, and the final stage implicates the evaluation of the first two stages.

Salonen and Karjaluoto [25] highlight a different aspect of the process in the definition by suggesting that personalization is a company-driven process, to differentiate it from customization as a consumer-driven process.

However, such distinction is not accepted by all the scholars and there is a major controversy in differentiating the concepts. Moreover, a stream of research differentiates between actual and perceived personalization, arguing that they are distinct constructs. Various interpretations of customization and perceived personalization are analyzed.

3.1 Customization

A major controversy in defining personalization derives from its overlap with the concept of customization. A stream of research utilizes the same terminology interchangeably for both personalization and customization. For example, Desai [6] defines personalization as "the process of providing customized information, presentation and structure of the website based on the need of the user" (p. 51). Moreover, Zhang and Wedel [33] identify

three levels of customization, mass, segment and individual. The individual level is considered as the one that is personalized to each individual.

Others consider customization a sub-concept of personalization. According to Montgomery and Smith [9] personalization is a more refined concept than customization. Srinivasan et al. [3] refer to customization as "the ability of an e-retailer to tailor products, services, and the transactional environment to individual customers" with the advantage of reducing the time spent searching for what customers want (p. 42). It is referred to as a service that better meets individual customer needs and intensifies competition [34]. Ansari and Mela [18] differentiate between on-site and external customization. On-site, the customization of the webpage content can be performed by the company or by the consumer himself; whereas the external customization approach aims to attract a consumer to a website through other communication methods, whose content is relevant to the individual, such as emails, banners, affiliate sites. Arguably, from such definitions no critical difference is found from those of personalization analyzed, suggesting that personalization and customization are considered overlapping concepts with no characterizing features.

Another stream of research considers them two different concepts [18]. Also in this case, there is a lack of terminology specific to customization. The use of terminology to refer to customization online or offline is not always clearly defined. For example, Ansari and Mela [18] refer to it as e-customization, yet the term customization is also used in online settings [3].

Those who differentiate personalization from customization do so depending on who starts the process. Personalization is considered as a process automated by the marketer, whereas customization as demanded directly by the consumer. According to Schilke et al. [36] the concept of personalization should not be confused with customization and the difference is determined by who is in control of the content. Customization refers to the appearance features, for example, colors, text fonts and display of information. Following such distinction, personalization can be considered as a system-firm initiated process and customization as another form of personalization which is consumer-driven [5, 6, 9, 37]. Yet, also such distinction is not uniformly accepted by the scholars. For example, in

Srinivasan et al. [3], customization online is defined as a process starting from the e-tailer. Hence, distinguishing the concepts based on the initiator of the process could be misleading, especially online, where there is a constant interaction between the user and the firm. Therefore, also for customization no definition is without consistency issues.

3.2 Actual and Perceived Personalization

Another concept that emerges from recent definitions is that of perception [14, 26, 38, 39]. Xiao and Benbasat [39] adopt the term of "perceived personalization" and define it as the extent to which an individual believes that a personalization system actually understands his/her preferences. Lee and Park [14] suggest that the personalization of online services is formed by the perception of the combination of the features offered by the store to a consumer during their experience online.

A message produced by a personalization system may be perceived as not personalized; whereas a generic one may be interpreted as personalized [38, 39]. Actual personalization occurs when the sender of the personalized message intentionally modifies a generic one to fit the preferences based on the individuals' data; whereas perceived personalization depends on how the individual believes it fits his/her preferences. Perceived personalization makes it difficult to understand what consumers actually consider as personalization. This is because consumers do not always know what their preferences are or they do not have any preference at all. As a result, they form their preferences depending on situational cases, which makes it challenging to measure actual preferences, causing errors in the personalization process [21, 26]. According to Li [26] actual and perceived personalization represent different constructs; where the firm is in control of actual personalization, whereas the consumer of the perceived one.

4. Personalization Elements

This section analyses the features of personalization extracted from the definitions. Various features were identified and grouped under five broad elements, namely offerings, knowledge, channels, purpose and contextual factors. Additionally, each of these elements can be of various types, generating different definitions.

Wu et al. [24] define web personalization as “the adjustment and modification of all aspects of a website that are displayed to a user in order to match that user’s needs and wants”, suggesting that the definition is broad-based and that it focuses on the adaptation performed for each individual (p. 2). Arguably, it is a rather narrow definition as it presents only one possible channel through which personalization can be offered online and there are many other channels through which it can be delivered. Lee and Park [14] identify three aspects of online service personalization: offer, recognition and personal advice. Offer is represented by the personalized options provided to the consumer, recognition refers to individuals’ personal information and personal advice to the various types of suggestions. The elements identified are discussed in greater detail in the next sections to identify the sources of commonalities and discrepancies.

4.1 Offerings

Broadly, offerings in the definitions can refer to any of the marketing elements [22, 27]. The offerings identified in the definitions are of various types, including products [22, 40], services [22, 30], and content [5, 12, 14, 27, 41, 42]. According to Senecal and Nantel [43] products can be differentiated depending on their qualities, which can be of two types: experience qualities, which cannot be determined prior to purchase or search qualities, which can be identified before purchase. The content delivered can be in the form of communication messages, information about products or services, advertising messages and online content information searches. Moreover, each of these offerings can be personalized at different granularity levels.

The strategy of personalizing messages with personally identifiable information, such as greeting a consumer by its name, is widely used by firms and has been extensively studied by scholars. A name is considered to be an important aspect of oneself and it has the potential of activating self-reference. By increasing the relevancy of the content, it is argued that it leads to information processing [7, 26, 31, 44]. Information such as the name is considered “non-informative” content, this information is not related to the product. However, it is difficult to argue that any kind of information is “non- informative”. For example, adding a name could be interpreted as a source of quality and thus provide

indirect information. Wattal et al. [45] explore how different types of information in personalized emails impact consumer behavior. Indeed, consumers responded negatively to personal information, such as the use of the name. Whereas, they reacted positively to product-based personalization. Hence, the study shows that consumers do not always respond positively to personalized messages and that their responses depend on familiarity and the type of information personalized, suggesting a difference between informative and "non-informative" content. In contrast, according to Sahni et al. [46] adding the recipient name in the subject line provides positive outcomes, such as increased opening rates of emails, a reduction in un-subscriptions from the email campaign and an increase in sales. Two important factors that impact the type of offerings suggested to consumers have been identified: justification, which justifies the fit between the message and the personal information adopted, and the perceived utility present in the offer. In the absence of justification of the offering, individuals experienced higher reactance and lower click-through rate, yet responses to the message did not vary with an explicit justification from the firm. Hence, to avoid negative responses, it is suggested that firms should highlight the utility of the offering [42].

4.2 Knowledge

From the definitions [7, 10, 30, 32, 40, 42, 44, 47, 48] it clearly emerges that to provide the personalized offerings, information from the consumer is necessary. The knowledge can be retrieved from various sources. It can be based on consumer identity information, consumers' current behaviour, consumers' past behaviour and location [19]. Online users are often required to insert their personal information such as name, address, gen- der, age. This information is stored to create a user profile. Tam and Ho [49] refer to it as "personalized web content associated with the self or past episodic experience of the user" (p. 870). Moreover, when consumers interact online, data files in the form of cookies are stored, which enable the server to retrieve the information in the subsequent visits [24]. Personalization based on consumers' past purchases is referred to as behaviour-based personalization [40].

4.3 Channels

In the definitions considered, the channels identified were: websites [22, 29], social media, such as Facebook and emails [10]. Yu and Cude [7] in their definition suggest that personalized offerings can be delivered through various distribution media.

Selecting not only the right channel for personalization but also the most adequate mixture of channels is extremely important for personalization effectiveness. According to Shephard et al. [50] the platforms that are adopted to convey promotional media are key in influencing purchase behavior. Furthermore, the literature shows a gradual move of the interest of personalization on various types of channels and not just on traditional channels such as emails and websites.

Shanahan et al. [21] examine participants' ability to recognize personalization on social media compared to other forms such as emails, telemarketing and text messages. The study shows that personalization might be much more effective on social media compared to other channels and suggests that this result could be due to the interactive feature of social media and its intrinsic personal nature. Similarly, it is proposed that through the use of conversational agents such as chatbots, firms will be able to better engage consumers through the use of personalized information [51]. Additionally, the characteristics of the channel on which the personalized offering is presented are also important. For example, Bleir and Eisenbeiss [52] show that personalization increases advertising effectiveness only on motive congruent websites, where the motive of the advertising and the website match.

4.4 Purpose

The purpose of personalization is clearly stated in the definitions. Personalization is a customer-oriented strategy which aims to meet customer needs and preferences [5, 12, 25, 29]. In the definition of Aguirre et al. [12] the purpose is broadly described as "to maximize immediate and future business opportunities" (p. 35). A stream of literature on personalization researches the effects of personalization, in order to understand whether the purpose of personalization can be reached effectively and efficiently.

4.5 Contextual Factors

A few recent definitions have been found that take into consideration contextual factors, which are those factors that are not totally under the control of the firm. The only factor explicitly mentioned in the definitions is that of time. Aguirre et al. [12] highlight in their definition the importance of time in delivering the right content to the right person. Similarly, Salonen and Karjaluoto [25] in their definition emphasize the importance of delivering the options at the right time. Providing the right messages at the right time and in the right way has proven to be challenging as contextual factors impact its effectiveness. The issue of time is attracting attention in personalization. Time in web- personalization represents a context for interaction. The timing element is extremely important, yet it presents many issues as consumers' preferences are not stable and therefore it demands an understanding of consumers' immediate context [25]. Salonen and Karjaluoto [25] contribute to the advancement of the understudied area of temporal dynamics. To provide a better understanding of contextual effects, they incorporate motives within personalization by adopting the fundamental motives framework. Motivation is an important driver of preferences, hence accurate timing in personalization is difficult to achieve without a motivation match as web-personalization is about matching preferences. Moreover, the effectiveness of personalization has been found to diminish as time passes. Bleir and Eisenbeiss [52] confirm that personalized banner advertising loses effectiveness as time passes since the last visit.

Research is addressing the importance of contextual factors for personalization, such as consumers' characteristics, personal disposition, privacy concerns and emotions as they represent a challenge for firms because they cannot be controlled and make it difficult to capture behavioral responses to influence attempts [5, 13, 25]. However, the integration of contextual factors in personalization studies is relatively recent [25], which explains the lack of their integration in the definitions. Consistent with the principle of equifinality [53], it is suggested that no single configuration of factors such as time, privacy, trust, personal disposition and emotions can fully explain personalization as alternative configurations of these are likely to occur. Hence, the integration of these factors in personalization studies is essential.

5. Application of Personalization Elements to Recommendation Systems

In order to show the complexity of personalization as a construct formed by various elements, the example of recommendations is utilized, as they are widely used by practitioners and they are also extensively researched by scholars. Recommendations are information sources that can be personal or impersonal [54]. The recommendation itself does not assume that it is personalized. Hence, recommender systems for personalization are introduced. Subsequently, the elements previously identified of offerings, knowledge, channels, purpose and contextual factors are adopted to discuss personalized recommender systems.

Recommender systems are defined by Nguyen and Ricci [55] as "information search tools that alleviate information overload by suggesting items that are likely to suit users' needs and preferences" (p. 6). Consumers tend to "satisfice" meaning that they make a purchase when they discover a product that meets their basic criteria, even though a more in-depth search would result in a better offering, as their engagement in a broader search could be overwhelming. Recommendation agents represent a solution to such problem [57]. Recommendation agents' effectiveness depends on the extent to which they learn about individuals and their decision rules [34]. According to Ricci et al. [56], in their basic form, personalized recommendations are suggested as ranked lists of items. To do so, recommender systems try to predict the offering for the customer through data collected explicitly or in an inferential way. The data used by recommender systems refers to a user, items, or a transaction, determined by the relation between the user and the various items. Moreover, three categories of information that can be used for recommendations are identified: individual knowledge about the user, social knowledge from the community of the user and content knowledge about the items recommended.

Various types of offerings can be recommended, such as products, services and information, which support consumers' search, selection and reduce uncertainty. According to Zhang et al. [58] online product recommendations are produced by the system from consumers' past purchases and preferences or from the experience of other consumers with the product.

According to Senecal and Nantel [43] the possibility to provide recommendations is among the best ways to personalize the relationship for an online retailer. They research the influence of online product recommendations on consumer product choices by taking into consideration the type of product and the type of website. Different types of websites are considered: the sellers and third parties websites. Results show that online recommendations influence consumers' online product choices. Moreover, influence is higher for products with experience qualities; while the type of website does not influence consumers' choice to follow a product recommendation and does not affect perceived trustworthiness, as consumers pay more attention to the recommendation rather than the website on which the offer is presented. In contrast, Schreiner et al. [5], whose research focuses on the ideal design of personalized product recommendations in advertisements in different channels such as package inserts, email advertising and banner advertising, found that the channel is the most important attribute in personalization.

In recommender systems, contextual information is defined as additional information that directly impacts the relevancy of the recommendations. Context-aware recommendations take into consideration elements such as individuals' social setting and mood, the weather and the time [5, 35].

Zhang et al. [58] focus on online product recommendations in social shopping communities, which have the potential of providing real-time personalized recommendations. A model is developed to show not only how enabling factors (self-reference and vividness) but also how inhibitors (deceptiveness and information overload) of online product recommendations influence consumers' decision process and customer loyalty. Schreiner et al. [5] empirical results show that product recommendations in advertisements are generally not accepted, due to the quality of the recommendations and privacy. Hence, the knowledge from the algorithm is only one of the factors that should be considered in order to provide appropriate product recommendations.

Recently, perception is being used to study recommendations' effectiveness. Whang and Im [48] focus on how the personalization of a recommender system is perceived by individuals and investigate its effects. The results indicate that individuals, when they perceive the recommendations to be personalized, have higher trusting beliefs and

intentions. The interesting finding is that individuals responded positively to the claim of personalization, meaning that the claim itself affects consumers' belief, not only the actual recommendation.

6. Online Personalization in Fashion: Introduction

Fashion represents a vehicle for self-expression. Individuals utilize fashion to express their self-identity and find their individuality [59]. Therefore, it is assumed that personalization is extremely relevant in the fashion domain. Fashion is experiencing a major digital transformation, which is affecting all its facets, from design to marketing, sales and communication [59]. Online channels for fashion purchases are becoming increasingly popular among consumers, hence the growing importance of e-commerce in fashion. However, the possibility of e-retailing to provide mass-information and a wide range of products at any type of customer seems in contrast to consumers' desire for uniqueness. Moreover, it is argued that it can be much easier to ignore suggestions from a computer compared to a persuasive sales assistant in a store [60, 61]. However, the possibility to interact with individuals globally represents a big potential of online shopping environments for providing personalized offerings [17, 23, 62]. According to Jain et al. [63] retailers need to communicate to consumers through all the channels in real-time and utilize the lifestyle data available to provide personalized communication. Additionally, fashion represents an important field for research related to computer vision and studies are advancing the field by focusing on image retrieval, fashion parsing and fashion recommendation [64]. Hence, it is necessary to gain a better understanding of personalization in fashion online contexts.

6.1 Online Personalization in Fashion: Definitions

Similarly to the previous section, the definitions identified in the papers that discuss personalization are examined in order to understand the state-of-the-art of personalization in the fashion field.

Limited definitions of personalization specific to the fashion field were found, mainly because the studies adopted general definitions. Moreover, in some studies, it is not clear

to what they refer to as personalization. The major issue of controversy in the studies is the lack of differentiation between personalization and customization.

Koch and Benlian [65] refer to personalization as "the endowment of a promotional campaign with personal references such as greetings" (p. 38). In the study, personalization is considered as one of the marketing mix elements for the customer web experience. Trivedi and Trivedi [66], who study the moderating role of personalization in fashion apps, generally refer to it as a variable that describes the level to which a product or service can be tailored for the consumer. Yet, it is not explained what personalization represents in fashion apps. Whereas, Jain et al. [63] adopt the concept of hyper-personalization: it "works as a tool to marketer to provide the personalized information about the customers", and it involves three main areas: social listening, data analysis and content (p. 3). However, from such definitions, no apparent distinction between personalization and hyper-personalization can be identified and they seem to be considered as overlapping.

Lewis and Loker' [2] study, which explores employees' perspectives on retail in-store technologies including customization and personalization, does not provide a definition of personalization. However, a difference between the concepts emerges: customization seems to be connected to products, whereas personalization to services. This assumption is derived from the findings, which suggest that employees recognized the importance of satisfying consumers' individual needs through product customization or personalization of services through social media.

The overlap of personalization with customization discussed in the first section of the paper is also evident in the fashion studies [23, 66]. Wu et al. [23] define personalization as "the customization of a product to the needs of one consumer" (p. 73). Yet, throughout the study, they adopt the term mass-customization, considered as the co-design of an individualized product between a user and an apparel company to fit consumers' preferences.

Arguably, the overlap of the concepts derives from the multiple elements they have in common, as they both share the basic concept of individualizing an offering to match the preferences of a consumer and they contribute to the idea of uniqueness. In fact, the terms seem to be used as synonyms. Wu et al. [23] state that mass-customized products are truly

unique when they are highly personalized. Yet, the difference between the terms is not clear and could be used interchangeably.

Similarly, an overlap between the concepts is found in the study of Kwon et al. [67], which analyses the perception of fashion website attributes, including customization. Kwon et al. [67] define customization as "the ability of an e-tailer to tailor products, services, and the transactional environment to individual customers" (p. 531). The findings of the study demonstrate the importance of customization and in the conclusions it is suggested that fashion e-tailers should focus on personalization in order to satisfy consumers. However, within the study, a distinction between customization and personalization is not clearly identified, hence it could be implied that they are utilized interchangeably.

6.2 Personalization Elements in Digital Fashion

Limited research is found to address the various elements of personalization specific to fashion. According to Jain et al. [63] hyper-personalization enables to provide specialized products, services and information through the use of big data. In terms of services, Tao and Xu [17] identify the subscription service offered by some retailers as a curation service that can satisfy consumers' need for personalization. It is suggested that fashion subscription services, in contrast to other subscription services, are perceived as personalized boxes rather than actual subscriptions. This is because the study shows that consumers appreciate the personal styling feature offered by such services. Hence, personalization is seen as a form of curation, such as hand-picked products for each individual online. The big data derived from consumers' past purchases on different channels provides retailers detailed information about consumers' online search pattern, purchase history, transaction's amount, advertisement clicks and email subscriptions. Such information has a crucial role in providing recommendations to consumers [63]. Contextual factors specific to online personalization in fashion are yet to be addressed, with the exception of Kwon et al. [67], who confirm that demographic variables, such as gender, influence consumers' perception of fashion websites attributes including customization.

6.3 Recommendations in Fashion Studies

The research specific to recommendations in fashion is fragmented. Consumers are exposed to a wide choice in online shopping environments. Despite having easy access to a vast amount of information, the alternatives can cause choice overload. To overcome this issue, electronic decision aids in the form of recommendations are widely adopted by fashion retailers. To assist the customer, the recommendation can be made available directly by the online vendor or by a third party [62, 64]. Moreover, research is advancing in creating outfit recommendations, which involve the recommendation of sets of items. In particular, according to Chen et al. [64] there are two requirements for fashion outfit generation, namely compatibility and personalization. Compatibility represents how the items go together, personalization refers to the match between users' preferences and the recommendations. Limited research on the various types of channels that are utilized by fashion retailers for personalization is found, with the exception of the study by Trivedi and Trivedi [66] on fashion apps. Whereas, Jain et al. [63] highlight the purpose of creating unique online customer experiences.

7. Discussion

Personalization is omnipresent in online contexts. Many firms, supported by technological advancements and access to big data, embraced the trend of personalization assuming it would provide many benefits. Nonetheless, research does not fully support the apparently obvious effectiveness of personalization over standardization. Hence, despite being a widely researched topic in different fields, it continues to attract the interest of scholars, who aim to gain a deeper understanding of the concept and all its facets.

Research highlights that even though personalization appears to be a basic concept, it is difficult to apply, suggesting that firms should be cautious when implementing personalization practices. Hence, in this study, it is suggested that a systematic understanding of personalization is necessary in order to overcome its limitations.

The study shows that there is no definition that captures all the facets of online personalization. The definitions broadly describe it as matching offerings to consumers'

needs and preferences, based on the assumption that consumers not only have stable preferences but they also know what they desire.

Additionally, the study shows that in the definitions there is an overlap of personalization with customization, which are utilized as synonyms. Furthermore, the relatively recent interest in perceived rather than actual personalization [10, 21, 26] represents another source of inconsistency. Arguably, the absence of common terminology might be a cause of the lack of a comprehensive definition beyond basic assumptions.

This study utilized various definitions to gain a first understanding of the aspects that form personalization and grouped them under the broad five elements of offerings, knowledge, channels, purpose and contextual factors. Through the exemplification of recommender systems, it is suggested that the combination of all these elements form personalization. Moreover, personalization can be offered at different levels. Although it is assumed that a medium level of personalization should be most effective, an optimal level is not found [13]. Hence, personalization is not just about finding the best match to consumers' preferences, it is a complex construct. Only few definitions analyzed in the study expand it by, for example, including the timing aspect of personalization. There- fore, it is argued that an updated definition that captures most facets of personalization is necessary, especially for online settings, as firms do not have full control over all the elements.

The study shows a lack of research on personalization specific to fashion. In the field of fashion, the relevance of online personalization is connected to consumers' long-established need of individualization, the need to affirm their personal identity and differentiate themselves. Yet, it remains an understudied research area, with no clear definition. Some studies research personalization as one of the variables, such as a moderating variable of satisfaction in fashion apps [66] or as one of the advantages of subscription retailing [17]. However, the aim of the studies is not that of a deep understanding of the personalization process in the digital fashion field, evident from the lack of research on the elements.

8. Future Research Aim

The next step of the research aims to develop a comprehensive definition of personalization and identify specific terminology to the field of digital fashion communication to overcome existing inconsistencies. Arguably, an understanding of the concepts of personalization and customization and their characteristics is particularly important in fashion, as they are widely applied by fashion brands.

It is suggested that it is difficult to differentiate the concepts of personalization and customization because they are part of an iterative process and a constant transition between the two is possible. Therefore, differentiating the concepts depending on whether it is firm- or customer-driven could be limiting. A customer could proactively provide personal information and preferences. For example, when subscribing to a newsletter of a fashion brand, the individual can insert his/her personal details and state his/her preferences regarding the content to receive and at which frequency. As a result, the brand could send a newsletter customized to such information and the consumer will be fully aware of what he/she will receive. Instead, by tracking users' behavior, such as opening rates or click-through rates, the brand could personalize the offering and the consumer will not be able to fully predict the end result. Hence, from such suggestion, the predictability from a consumer perspective could be key in differentiating the concepts, as an individual would be able to mostly predict customization but not personalization because the process of personalization involves greater elaboration of data and higher creativity from the firm. In order to verify such assumption and overcome the contradictions above-discussed, the authors will adopt the Delphi method to identify specific terminology related to the concept. Moreover, future studies could focus on analyzing the five elements specific to digital fashion to reach a comprehensive definition. Arguably, it will enable to establish stable foundations for further and conclusive research on the process of personalization in digital fashion.

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5.2.2 Personalization and customization in fashion: searching for a definition

Accepted manuscript:

Nobile, T.H. & Cantoni, L. (2022). Personalization and customization in fashion: searching for a definition, Journal of Fashion Marketing and Management

Abstract

Purpose – The purpose of the study is to reach an in depth understanding of personalization and its components by developing a comprehensive definition of the concept in fashion. Moreover, it aims to clarify the open debate of the use of the terms personalization and customization.

Design/methodology/approach – The Delphi method was utilized for this study in order to collect the opinions of experts. This method is considered appropriate for reaching consensus among experts regarding a topic that is subject to debate.

Findings – The study provides a definition of personalization in fashion which is relevant in the current digital context and it identifies the building components of the concept. By developing a definition of personalization, it also clarifies the meaning of customization in fashion and suggests a possible explanation for the use of the different terminologies among experts.

Originality/value – This study contributes to the personalization and customization debate by providing an expert perspective on the topics specific to the fashion industry and by offering insights into open debates that have limited its advancement.

The definition represents an interesting theoretical contribution and offers avenues for further research. Moreover, it can be applied by fashion practitioners to guide the development of personalization strategies.

Keywords Fashion, Digital transformation, Personalization, Customization, Delphi method

Paper type Research Paper

Introduction

The digital transformation, the access to data, the spread of customer touchpoints, channel fragmentation, and the competitive fashion marketplace are changing the ways in which individuals interact and shop for fashion products. As consumers' shopping journeys and decision making processes are becoming increasingly complex (Riegger *et al.*, 2021), it is challenging for brands to connect with each individual and trigger a behavioural response. The Covid19 pandemic sharpened such challenges requiring an acceleration of fashion's digitalization process in order to reach shoppers (Berg *et al.*, 2020; Nobile *et al.*, 2021).

Retailers are seeking for effective ways to communicate with consumers by developing a dyadic relationship and by providing positive shopping experiences through personalization (Lynch and Barnes, 2020).

Although tailor-made clothes are as old as human being, after the industrial revolution and the advent of ready-to-wear, standardisation has become more and more present. In recent decades, personalization has become a trend again, also thanks to digitally supported processes, which enable deeper and faster changes in the production of items as well as in the crafting of messages (Chen, 2020; Schreiner *et al.*, 2019; Lang *et al.*, 2020; Sebald and Jacob, 2020). By 2030, the whole shopping experience is expected to be highly personalized supported by digital advances that offer the instruments to access increasingly detailed information about individuals (Grewal *et al.*, 2017; Hossaina *et al.*, 2020; McKinsey & Company, 2021).

Despite the positive expected outcomes of personalization for both individuals and retailers, its understanding remains incomplete. Two main reasons have been identified for its fragmented understanding: the lack of a generally accepted definition and the overlap with other concepts such as that of customization (Shanahan, 2019). An explorative study by Nobile and Kalbaska (2020) has shown that personalization has been defined in many ways. Arguably, reaching a comprehensive definition of personalization will enable academics to have a common agreed terminology on the topic and reduce the confusion derived from the use of personalization and customization in different ways. Additionally, defining personalization could also support the industry by helping to address important key managerial questions, such as that of its effectiveness. Empirical

findings on the effectiveness of personalization are not consistent as some studies confirm its positive effects, yet others do not (Strycharz *et al.*, 2019). Such inconsistencies could be explained with the fact that what means doing effective personalization evolves over time and could become irrelevant with the advances brought by new technologies (Salonen and Karjaluoto, 2019). Therefore, identifying the elements that build personalization is suggested to be crucial.

As stated by Kant (2020 p.4) in the current web experience "personalization seems both undefined and just 'there'". This study aims to challenge and advance personalization research in the fashion industry by developing a comprehensive definition of it. By adopting the Delphi method, it aims to answer the following questions:

- What is personalization?
- Is there a shared definition of personalization in the fashion field that reaches the agreement of fashion experts? If yes, how is personalization defined?
- Are personalization and customization overlapping concepts according to fashion experts? If no, how are they different?

Literature Review

Personalization

Generally, personalization is utilized as an umbrella term to indicate a process of preference matching where something is matched to an individual's needs and wants (Salonen and Karjaluoto, 2019). The definitions of personalization are numerous and it is challenging to identify an agreed comprehensive definition in literature, creating controversies on the concept. This is because personalization is studied by many disciplines, earlier and later definitions are sometimes in contradiction, definitions often present elements which are in conflict, and there is an overlap of concepts. The following sections expand these issues by providing some examples.

There are a variety of definitions that reflect the area of interest and the scope of the studies (Salonen and Karjaluoto, 2019; Vesanen, 2007). For example, in advertising it is defined as "advertising messages that are tailored to individuals' preferences and characteristics based on specific information about the respective customer" (Schreiner *et al.*, 2019 p.88),

whereas in human computer behaviour as an "automated process including identifying consumer, collecting consumer behavioural records, analysing consumer preferences and tailoring content for each consumer" (Huang and Zhou, 2018 p.105).

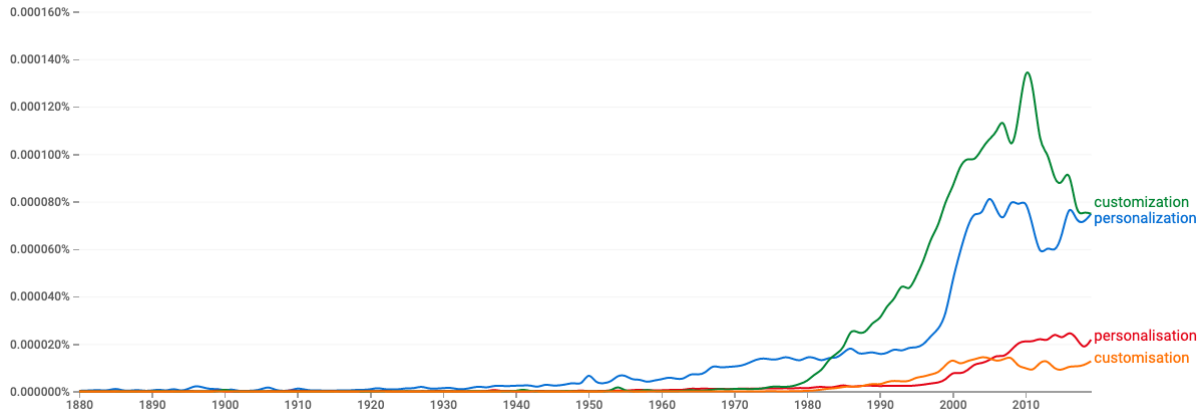
Early definitions utilized personalization to refer to the brick and mortar context. The increase of personalization strategies has created a discussion in defining personalization in its use in online contexts. A stream of research utilizes the term "personalization" to refer to offline strategies and introduced the term "web personalization" to refer to online strategies (Salonen and Karjaluoto, 2019); whereas another stream adopts "personalization" for both online and offline personalization (Schreiner *et al.,* 2019).

Additionally, definitions in the literature sometimes are in contradiction. This is partly explained by digital advances. For example, Zhang and Sundar (2019 p.87) define personalization as a "system-driven tailoring of content…" which highlights the firm as the source of tailoring. In contrast, Wind and Rangaswamy (2001 p.15) state that "personalization can be initiated by the customer … or by the firm …." Technological advances have empowered the user to actively participate in online activities. Hence, creating a distinction between a system- or user-initiated process could be limiting.

Another controversy emerges from the different use of customization: a stream of research utilizes it as a synonym of personalization while another as a different concept (Nobile and Kalbaska, 2020).

The interest in personalization and customization is not recent. A search on Google Books Ngram Viewer (2020) with the terms personalization and customization, both with the English and American spelling, shows that such topics started to emerge from 1950 (figure 1) and that both terms have long been utilized. The rapid growth from the 1980s could be explained with the term "mass customization", coined by Davis in 1987. Hence, it is suggested that to define personalization both terms should be analysed.

Figure 1. Google Books Ngram Viewer: personalization, personalisation, customization, customisation (https://books.google.com/ngrams/)



Customization

Both the terms personalization and customization have been utilized to describe the process where a product is modified to match an individual's preferences (Salonen and Karjaluoto, 2019). As a result, the definitions of personalization and customization present both elements in common and discrepancies (Nobile and Kalbaska, 2020).

It has been suggested that personalization has the highest potential online compared to customization defined as "made at the request of the consumer" (Montgomery and Smith, 2009 p.130), yet due to technology advances such distinction seems less relevant as individuals have many possibilities to interact with online tools.

Moreover, in the literature, it emerges that customization usually refers to the strategies adopted by retailers to differentiate tangible products (Ribeiro *et al.*, 2017). This is in line with the increased interest towards customization in fashion driven by technology advances, as apparel products have been identified as a suitable product for online mass customization showing its potential to provide fit garments according to the body size and the possibility of co-design supported by techniques such as body scanning and computer aided design (Nayak *et al.*, 2015; Lang *et al.*, 2020; Fiore, 2008; Wu *et al.*, 2015). For example, Lang *et al.* (2020) distinguish between three levels of mass customization by focusing on different aspects of the product that can be modified: style, fit/comfort and

functionality. However, differentiating the concepts based on whether they involve a tangible or intangible product does not appear to be accepted by all researchers as Srinivasan *et al.* (2002 p.42) define customization as "the ability of an e-retailer to tailor products, services, and the transactional environment to individual customers".

Delphi method

The Delphi process gets its name from the Delphic oracle and its ability of foresight and interpretation (Jones and Hunter, 1995). It was developed in the 1950s at the RAND Corporation and has become a widespread technique applied in many different fields, such as medicine, marketing, engineering, information system and education (Rowe and Wright, 1999). The Delphi technique utilizes opinions of experts with the aim of overcoming the disagreement on a topic and reach an agreement on an area of debate, allowing to reach a large group of experts and reduce geographical limitations (Jones and Hunter, 1995). Moreover, it is considered effective for the development of concepts and identifying directions for future research (Vogel *et al.*, 2019). Hence, this technique is adopted in order to overcome the inconsistent knowledge regarding personalization, reach consensus on personalization in digital fashion communication and provide avenues for further research.

The method allows for a controlled interaction of the respondents and eliminates issues of direct confrontation between the panellists, allowing them to freely express their opinions without being influenced or swayed towards more powerful participants. Moreover, according to Skinner *et al.* (2015) the Delphi method is a relevant method for information system research issues; for all these reasons, this method is chosen to study personalization in a digital context.

Methodology

Study design

The aim of the study is to reach a consensus regarding the definition of personalization within the field of fashion. Consensus methods are adopted when unanimity regarding a specific issue has not been reached or when there is inconsistent evidence on a concept

(Jones and Hunter, 1995). The agreement reached by consensus methods can be of two types: the extent to which each participant agrees with the problem under research and the extent to which participants agree with one another (Jones and Hunter, 1995). The aim of this study is to measure the extent of agreement of selected experts on the definition of personalization. The Delphi process involves a series of steps, which Skinner *et al.* (2015) refer to as: the exploratory stage, the distillation stage and the utilization stage. The first stage of a Delphi study involves the selection of the panel and the development of the questionnaire(s) that will be administered to the panellists. The second stage requires collecting the data through the questionnaires and the final stage entails data analysis.
The subsequent sections present how such steps are applied in this study.

Panel recruitment

Panel recruitment is extremely important for a successful Delphi study. According to Rowe and Wright (1999), the selection of the panellists represents one of the factors that distinguishes "ideal" from "laboratory" Delphi studies. This study follows the specification of an "ideal" Delphi by recruiting a panel of experts, who should cover a top position in their field, be forward looking and have an international outlook. Moreover, to reduce bias from the group of experts selected, no particular interest or preconception should dominate (Vogel *et al.*, 2019; Jones and Hunter, 1995).
In order to meet these principles, non-probability purposive sampling was adopted to guarantee that each participant met the study criteria. Selected participants had to meet one or more of the following criteria:

- Actively working for a fashion company or a company that provides services to fashion brands (B2B consultancy firms and agencies that provide personalization services)
- Actively researching in the field of digital fashion communication/marketing
- Experience with personalization or customization
- Highly knowledgeable about a company's online communication/marketing strategy.

Seventy-eight experts were invited to participate in this study. A quite high initial target was selected in order to have a reasonable number of panellists at the end of the study, as at each stage of the Delphi it is expected that the number of responses will decrease due to dropouts (Skinner *et al*., 2015).

Questionnaire Development

The questionnaire(s) were developed with Qualtrics and administered to the panellists via e-mail or LinkedIn. The surveys include both closed-ended questions and comments by the panellists. Such decision is supported by Rowe and Wright (1999) who found an improved accuracy in reasoned feedback compared to solely statistical feedback as it enables the generation of ideas that were not included in the survey and identify new areas of debate that could not otherwise be captured.

The survey administered in round one included 64 statements. The research literature was utilized as a starting point for enquiry into personalization. The definitions and statements of personalization/customization were broken down in order to extrapolate the items. For example, for the statement "An object in fashion is based on an individual's…", the item "characteristics" was taken from Dijkstra (2008), the item "preferences and needs" from Kang and Namkung (2019) and so on for each item (Table I).

Due to the exploratory nature of the study, items are not exhaustive, yet they aimed to start the generation of ideas among the panellists.

Each expert was asked to rank the items on a 5 point Likert scale, from strongly disagree to strongly agree, as it is shown to be an appropriate scale for Delphi studies (Daniel *et al.,* 2020). This round also included the collection of the panellists' demographics. Force response was applied for the close-ended questions. The questionnaire was piloted with 6 academic experts in the communication field in order to identify unclear items and improve the readability and the structure of the survey.

The second round of the questionnaire included statements from round 1 and statements generated from the open-ended questions. As shown in figure 2, in order to evaluate their responses, each participant was provided his/her position (in red) and the position of all

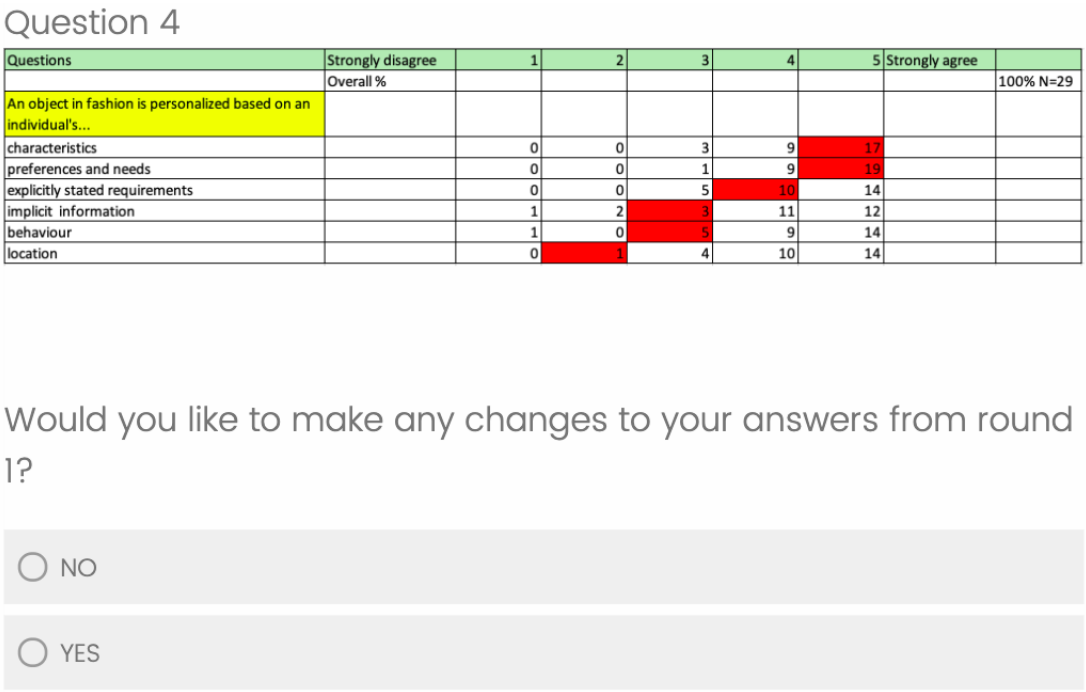
other experts in aggregate form. Again, open-ended questions enabled them to provide any additional thoughts they had.

In the third round each participant was provided for the final time his/her position compared to the position of other experts to enable them to re-evaluate their answers. Moreover, a definition of personalization/customization derived from a first analysis of the previous surveys was presented for the panellists to evaluate. For the last time, participants had the possibility to provide additional information through open-ended questions.

Table I. Example: development of survey items for the statement "An object in fashion is based on an individual's…" from the literature

Survey items: individual	**References**
An object in fashion is personalized based on an individual's...	
characteristics	"refers to the incorporation of one or more recognizable individual *characteristics* (e.g., one's first name) in a persuasive text." (Dijkstra, 2008 p.765)
preferences and needs	"the ability to provide personalized service and information tailored to individuals' *preferences*, *location* and *needs*." (Kang and Namkung, 2019 p.740)
explicitly stated preferences	"the process of preparing an individualized communication for a specific person based on *stated or implied preferences*." (Pappas et al., 2014 p.194)
implicit information	(Pappas et al., 2014 p.194)
behaviour	"is the adaptation of products and services by the producer for the consumer using information that has been inferred from the consumer's *behaviour* or transactions." (Montgomery and Smith, 2009 p.130)
location	(Kang and Namkung, 2019 p.740)

Figure 2. Qualtrics screenshot: example presentation of a question in round 2



Question 4

Questions	Strongly disagree	1	2	3	4	5	Strongly agree	
	Overall %							100% N=29
An object in fashion is personalized based on an individual's...								
characteristics		0	0	3	9	17		
preferences and needs		0	0	1	9	19		
explicitly stated requirements		0	0	5	10	14		
implicit information		1	2	3	11	12		
behaviour		1	0	5	9	14		
location		0	1	4	10	14		

Would you like to make any changes to your answers from round 1?

○ NO

○ YES

Data Collection

The Delphi can be conducted till consensus is reached or for a set number of rounds. This study conducted three rounds, which are generally considered sufficient (Skinner *et al.*, 2015).

Four key features should be met to successfully collect data through the Delphi process: (i) iteration, (ii) anonymity, (iii) controlled feedback and (iv) statistical aggregate response (Rowe and Wright, 1999). The collection of data through Qualtrics personal links enabled to reach these criteria.

The surveys were submitted to the panellists at a monthly interval from end of June 2020.

Analysis

According to Diamond *et al.* (2014), it is essential to define the criteria for how consensus or the lack of it will be measured within the study.

Consensus in this study is defined as a percentage agreement defined a priori with a threshold of 75%, meaning that consensus is considered reached for a survey item if at

least 75% or more of the panellists agree or strongly agree with a statement (Daniel *et al.*, 2020; Diamond *et al.*, 2014; Vogel *et al.*, 2019). If a statement reached at least 75% of consensus from the experts it was utilized to develop the definition, otherwise it was excluded from the analysis. A limitation of a priori specifications is that some statements might not reach consensus as they might fall just below the arbitrary cut-off. These statements can be considered a posteriori if there is sufficient justification by the third round, supported by the comments of the panellists themselves (Diamond *et al.*, 2014). This criterion was applied for items that reached an agreement between 70% and 74%. Content analysis was utilized for open ended questions. For example, the survey item "personalization in fashion should always involve added value for the individual" received 100% consensus from the study panellists, hence it was utilized for the definition. Whereas, the item "the difference between customization and personalization derives from the source of tailoring (user or firm respectively)" did not reach an agreement of at least 70%, hence it was not considered to develop the definition.

Results

The results are structured in three main sections: the first section presents the response rate of the Delphi and the demographics of the panellists; the second section presents the number of survey items that reached consensus, the definition and the extent to which the panellists agreed on this definition; the final section breaks down the definition in order to demonstrate how it was developed from the analysis of the survey results.

Section 1: Response rate and demographics

Seventy-eight experts were invited to participate in the study. Of these, 34/78 started round 1, yet 29/34 were considered relevant for the study as they fully completed round 1 (37.1% response rate), 21/29 completed round 2 (72.4% response rate), and 18/21 completed round 3 (76.2% response rate), which, according to the literature, is an appropriate response rate for a Delphi study (Skinner *et al.*, 2015).

Descriptive statistics were utilized to describe the characteristics of the panellists (table II). By the third round, the majority of respondents were female, they had a master degree,

and the current employment was based in Switzerland or UK. Moreover, 10/18 panellists had between 1-10 years of experience working in the field, the other 8/18 had 11 and above years of experience. The panellists who completed the three rounds covered a range of different roles at the time of the study, which is important for the dynamics of the Delphi: assistant merchandiser, commercial manager, COO, CRM & loyalty manager, founder, futurist, global brand manager, head of online, IT manager, independent consultant, lecturer and researcher, marketing communications lead, PhD researcher, professor, self-employed, senior CRM officer.

Table II. Descriptive statistics of the panellists

	Round 1 (n=29)	**Round 2 (n=21)**	**Round 3 (n=18)**
Gender			
Female	21	16	13
Male	8	5	5
Degree			
High School	2	1	1
Bachelor's degree	5	3	2
Master degree	17	13	11
Ph.D.	5	4	4
Years of experience			
1 to 5	11	10	9
6 to 10	3	1	1
11 to 15	6	4	3
16 and above	9	6	5
Country (more than one per person)			
Switzerland	13	9	8
UK	11	10	8
Italy	2	1	1
Belgium	1	1	1
Sweden	2	1	1
Other (not specified)	1	-	-

Section 2: Overview of survey items and definition

The number of statements for which consensus was achieved increased from the first to the final round, as shown in table III. By the final round, consensus was achieved for 47 statements, whereas it was not reached for the remaining 17 statements.

Table III. Items in each round

	Items Round 1	**Items Round 2**	**Items Round 3**
85% or above consensus	21	26	31
75% or above	*41*	*44*	*47*
No consensus	23	20	17
Total	64	64	64

The subsequent section introduces the definition derived from the Delphi.

Definition: Personalization in fashion

"A dynamic process in which an object is changed for an individual in order to provide added value for the individual herself/himself.

Such process, which takes place in a given context, can be user- or firm-driven.

The object, either tangible or intangible, is changed in dimensions at a number of states.

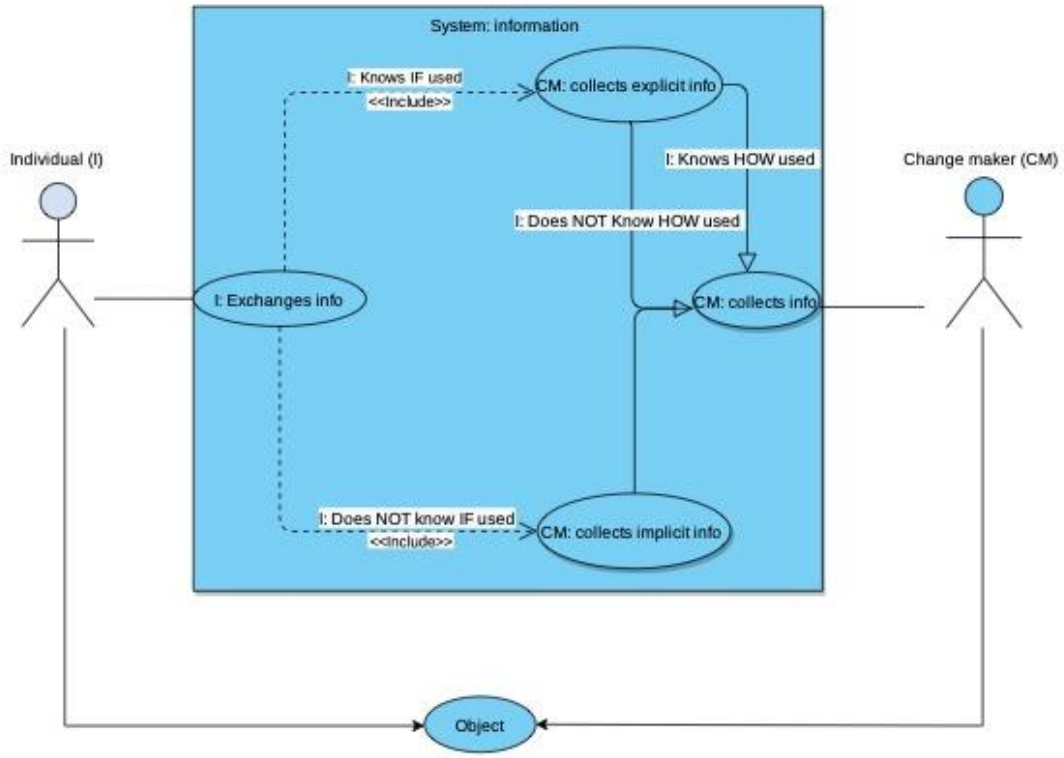
The individual either provides information about her/himself, or the information is inferred by the change maker.

According to some, personalization and customization are different concepts. Customization is then characterized by an active contribution from an individual, up to her/his involvement in the co-design of a product."

The definition reached 100% consensus, with 50% of the panellists strongly agreeing and 50% somewhat agreeing. The panellists highly agree throughout the study that the term "personalization" applies also to the online context. Hence, the definition is suggested to be relevant both for online and offline contexts.

Figure 3 provides a visualization of the process of information exchange between the individual and the change maker. It highlights that the individual might know or not know if and how their information is used to inform the changes.

Figure 3. Personalization: information exchange



Section 3: definition explanation

This section breaks down the definition by presenting the results from the survey items that did (or did not) reach panellists' agreement in order to show how the data collected was utilized to develop it.

"A dynamic process in which an object is changed for an individual in order to provide added value for the individual herself/himself"

The items regarding personalization in fashion always involving "a process of change" did not reach consensus. However, the items that were utilized in the survey to describe

the “personalization process in fashion” all achieved consensus, excluding the item “personalization process in fashion can refer to any behaviours occurring in the interaction intended to contribute to the individuation of the customer”. Moreover, the definition of personalization provided by a panellist was considered important by 16 respondents: *“Personalization is capturing a user's dynamic preferences from the user data and using this knowledge in all communication and interaction with the user”*. Hence, the concept of dynamicy was inserted in the definition, suggesting that as persons can change, the personalization performed for them evolves.

From the first round, panellists strongly agreed that personalization in fashion always involves an individual for which personalization is performed. Moreover, the findings indicate that personalization should always involve added value for the individual and the change maker. Added value for the individual reaches 100% agreement, suggesting it is a critical element of personalization.

“Such process, which takes place in a given context, can be user- or firm-driven”

The results show that personalization process in fashion can be both user- or firm- driven. Additionally, panellists strongly agree that it “happens within a context”. Yet, agreement is not reached on all the factors suggested; the factors of timing, personal disposition, privacy concerns, cultural dimensions and space reach an agreement that they could affect personalization, whereas the factors of surrounding environment, market competition and individual’s emotions do not. Furthermore, contextual factors are not believed to affect the end result of personalization. Also, individual’s perception is not considered to affect the end result of personalization. Hence, they are not stressed in the definition.

“The object, either tangible or intangible, is changed in dimensions at a number of states”

Results show that personalization does not always involve a physical object to be modified, yet this result could be driven by the misleading term “object”, as in the survey section referring to the “something” that can be personalized in fashion both tangible and intangible examples reach agreement. Additionally, panellist also strongly agree that the “something” can be modified at different levels.

Consensus is also reached for the fact that an "object" in fashion can be personalized based on various elements, such as characteristics, preferences and needs, explicitly stated requirements, location, implicit information and behaviour.

"The individual either provides information about her/himself, or the information is inferred by the change maker"

Results show that information is at the core of personalization. It emerges that the information can be directly provided by the individual or inferred by the change maker. The term "change maker" did not reach agreement in the first two rounds when describing the elements that are always involved in fashion personalization. Yet, it was accepted in the third round, just referring to all those entities that are not the individual herself/himself. Additionally, the panellists agree that the outcome of fashion personalization depends on information, on one side on the information provided by the individual and his/her willingness to provide it, on the other on how the information is collected and utilized. Interestingly, consensus is not reached on whether prior permission should be gained from the individual before utilizing the information.

"Customization…"

This study provides insightful results regarding the open debate of customization in fashion. No agreement emerges on whether the term personalization can be used as a synonym or interchangeably with the term customization. Hence, it is considered necessary to differentiate the concepts in the definition.

Interesting are the results from the panellists who consider them different concepts (panellists round 1 = 21/29; round 2= 16/21; round 3= 13/18). In the first round panellists agree that customization in fashion involves a user in the co-design of product. The agreement on such item strengthens in the second and third round, in which respondents also agree that customization in fashion can provide fit garments according to the body size and it is characterized by an active contribution from the user. Therefore, these are the items highlighted in the definition.

From the comments provided by the panellists, it emerges that the opinions regarding the difference between personalization and customization in fashion are various, from being described as nearly synonyms with the exception that *"personalization can have an extra value"* to being described as very different concepts as customization *"...allows you to change a service/system and adapt it to your needs giving you few predefined options from which you can choose... In contrary I see personalization as more of a "learning" process during which the users provide their personal information and the system/service learns from it..."* Additionally, customization is stated to refer to *"a change in the physical aspect of the product or service" in contrast to personalization as "more abstract".*

A panellist also utilized the information science perspective relevant to fashion to differentiate personalization from customization *"customization does not need a profile while personalization is often profile driven as such customization and personalization are not taken as the same construct".* Similarly, another respondent states that *"customization is something more modular with a selection to choose from"*.

Discussion

Personalization

This study contributes to the literature by developing a definition of personalization in the fashion industry and by comprehensively outlining its main characteristics.

Indeed, as stated by a panellist *"the term is rather broad and overused".*

This study overcomes some controversies related to the term. One of them is the distinction between "personalization" and "web/online personalization", as high agreement is reached that experts utilize the term personalization to also refer to the online context. Such result is in line with recent fashion retailing research, which shows that in an omnichannel environment the boundaries between digital and physical are blurred for a blended experience (Lynch and Barnes, 2020; Alexander and Blazquez Cano, 2020).

The panellists define personalization in different ways, highlighting different aspects of it. For example, an interesting description suggested by a panellist for personalization in the fashion context is that of a *"bespoke service",* which really highlights the idea of tailoring and made-to-measure.

The challenge of this study was to reach a definition able to capture all the nuances which emerged from the experts.

Consistent with the literature (Oberoi *et al.*, 2017; Salonen and Karjaluoto, 2019; Huang and Rust, 2017; Murthi and Sarkar, 2003) and with multiple panellists personalization is described as a process.

Personalization process

A panellist identifies retailers' inability to keep-up with consumers' evolving expectations as an issue of personalization *"It's more of a process rather than a one-change per customer, which is where I believe a lot of brands go wrong, as they alter one element or multiple elements once, but the customers' expectations of personalisation also evolve and to keep engagement rates high, so should the personalisation process itself".* Moreover, an element that emerged from the study, which has not been highlighted in the definitions of personalization so far is "dynamicy". Retailers should aim at *"capturing a user's dynamic preferences"*, again implying the need to keep-up with consumers' preferences, which in fashion are in constant change. Although the majority of respondents agree with the idea of personalization as a dynamic process, it is suggested by a respondent that a dynamism between the provider and the consumer might not always be the case. This could partly explain the different findings of Strycharz *et al.* (2019), where personalization is never described by practitioners as a process as they do not recognize the interaction with consumers.

In contrast to some definitions, which consider personalization as solely a system-driven process (Zhang and Sundar, 2019), the process in fashion can be both user- or firm-driven. The study by Strycharz *et al.* (2019) states that practitioners do not create a distinction between who starts the process of personalization. This could provide an explanation for the lack of agreement among the fashion experts on the term "change maker" in this Delphi study, as it would assume the need to create a distinction on who starts the personalization process.

The process of personalization involves changing an object. Existing definitions mention different objects that can be personalized (Oberoi *et al.*, 2017; Fan and Poole, 2006;

Schreiner *et al.*, 2019). From this study, in agreement with the definition by Salonen and Karjaluoto (2019), it emerges that both tangible and intangible objects can be personalized. Additionally, the definition highlights that objects in fashion can be modified at different levels. A compelling reflection arises from a panellist, who states that identifying the right level of personalization in fashion implies the necessity of taking into consideration the *"customer's touch"*, reflecting fashion as a mean for individuals to express themselves (Kalbaska *et al.*, 2019). Research has started to address the importance of the level of granularity in personalization (White *et al.*, 2008). Yet, existing definitions do not stress the relevance of such issue, which could be crucial for the success of the strategy.

The object in fashion personalization is changed for an individual. As stated by a panellist *"the main reason behind it is always increased value for at least one party … but it is mainly focused in increasing customer value"*. Hence, even though ideally, as stated by Vlasic and Kesic (2007), the aim of personalization is that of reaching added value for all the parties involved, the definition highlights the importance of adding value for the individual. Providing relevant personalization strategies that meet customers' expectations is increasingly challenging as strategies become quickly obsolete. This could be a possible explanation of some contrasting results in the literature regarding the effects of personalization.

Information

In order to change the object, information is required. This research provides a clarification regarding the type of information used for personalization in fashion. Consensus is reached among the experts that both information provided by the consumers and inferred by the company can be utilized. Personalization can be both proactive and reactive. In the first scenario, it makes predictions based on the data collected implicitly, whereas in the second scenario, it reacts to the explicit requests of an individual (Zhang and Sundar, 2019). An individual's interaction with different technologies provides retailers vast amount of information that enables them to get to know the individual (Winter *et al.*, 2021). Moreover, technologies, such as emotion aware devices, are advancing the type of data

that can be collected, enabling personalization to advance from cue-based to trait-based personalization.

When discussing the information utilized for personalization, it is fundamental to consider the so-called privacy-paradox, which although widely researched remains open to debate (Strycharz *et al.*, 2019). Interesting are the Delphi results as panellists do not reach an agreement that prior permission from an individual should be received for personalization. Nonetheless, "privacy concerns" are identified amongst those factors that affect fashion personalization. Such apparent inconsistency could be partially explained by the comment of a panellist: *"Due to GDPR I think consent has become widely accepted practice behind personalization services across retail businesses worldwide"*, implying that despite the importance of privacy concerns, individuals are increasingly aware that their data is being utilized. According to a stream of the literature, consumers are increasingly aware that firms collect information (Wattal *et al.*, 2012), another highlights the lack of individuals' awareness (Strycharz *et al.*, 2019). Arguably, more and more individuals might be aware that information is collected but they might not be aware (or not completely) of the set of rules and how the information is used by retailers in order to guide the personalization process. Hence, fashion retailers should be aware that, even though by definition personalization does not appear to always require individual's prior permission, privacy concerns are extremely important for the outcome of personalization.

Context and outcome

In accordance with the study by Strycharz *et al.* (2019), according to which data is still at the centre of personalization, from this study it emerges that the end result of personalization mainly depends on information: *"data is what drives a lot of changes"*. This could explain why the panellists agree that some factors could affect personalization, yet do not determine the end result of personalization. However, despite the centrality of information, other aspects are slowly gaining importance. As stated by a panellist when referring to the dimensions of personalization: "*would like to see emotions and other neuroscience and body related values*". Moreover, it is mentioned that it is interesting to consider perception as there is a gap between what machines learn and how people

perceive. Also, the way in which personalization is presented is mentioned by a panellist to be very important, suggesting the importance of A/B testing. These ideas could be a first sign towards the importance of other factors apart from information also from an expert perspective.

Customization

This study presents a suggestion, which reached expert agreement, on how to overcome and treat the controversies regarding the use of the terms personalization and customization. As presented in the definition, for some they are different concepts. Hence, it is not possible to conclude from the study that the terms can be always used as synonyms. The important contribution of this research is that for all the panellists, even for those who suggest that personalization and customization could be used as synonyms, customization can be thought as characterized by an active contribution from an individual.

The characterizing element of an individual's high involvement in fashion customization is supported by Seo and Lang definition (2019 p.3) "… empowering consumers to build their own products". The empowerment derives from the involvement of the individual in the process. Customization involves more structured interactions as it usually requires the individual to choose from predefined options. This result is in line with the study by Strycharz *et al.* (2019) according to which customization allows consumers to select their own parameters and it requires consumers' decisions. Arguably, this distinction is connected to users' awareness of what they see in terms of set of possibilities. When an individual makes choices by selecting predefined options provided by a retailer, for example by choosing among a range of colours, the individual should be able to anticipate to a certain degree what the outcome will be. Hence, the individual could be aware that the retailer utilizes the information provided but in some cases it might not be obvious to the individual how the information is utilized, for example when receiving some recommendations. Additionally, the individual might not be aware that the retailer utilizes his/her information. This is in line with studies which show that users' knowledge of personalization is scarce (Strycharz *et al.*, 2019).

From this study it emerges that the "something" to be personalized can be both a tangible or an intangible object. Hence, distinguishing the concepts based on what can be modified does not seem relevant. Arguably, it is more related to how it is modified. The statement of a panellist that customization refers to *"a change in the physical aspect of the product or service"* in contrast to personalization as *"more abstract"*, could be explained with the concept of involvement of the individual in the process. The change of personalization could appear "more abstract" as the individual is not fully involved in the process, whereas the involvement in customization appears clearer. For example, when you customize a product you are more involved than when you provide demographic details to sign up to a newsletter as the choice of customizing a bag with initials or a motto requires further engagement and decisions from an individual compared to adding your name to a mailing list.

Conclusion, Limitations and Further Research

This study makes multiple contributions to personalization research. It provides a comprehensive definition of personalization in fashion from an expert perspective and it suggests a solution for the use of the terms personalization and customization.

Reaching a definition of personalization has theoretical and industry implications. From an academic perspective it is critical to be able to define a concept and from an industry perspective, although it might appear less relevant as it is not expected that the fashion industry will unanimously adopt one definition of personalization as saying "personalized newsletter" or "customized newsletter" will be understood, it could offer interesting insights. It could represent a useful guide for fashion firms that wish to implement personalization strategies by clarifying the "building blocks" which should be considered. Arguably, it provides managers a clear understanding of personalization's components, stakeholders, and goal. While in many industry practices, personalization has been interpreted as "more of the same", at times yielding to a user's perception of being stereotyped, adopting the proposed definition will help companies to better integrate personalization as a dynamic process. It could also be valuable for firms to consider the definition when the strategies implemented are not providing the expected results. For

example, according to the definition, personalization "should provide added value to the individual": the firm could question whether the personalization strategy under analysis is providing an added value to its customers, what added value is being offered, and so on. An analysis of the definition might help highlight any potential issues of the strategy in place. Furthermore, the definition could guide firms who need to communicate their personalization strategies. Indeed, if they wish to distinguish between "personalization" and "customization" in their communication they could consider adopting the term "customization" when the strategy involves an active contribution from consumers.

The validity and the applicability of the Delphi method have been criticised, mainly for the issue of bias derived from the selection of the experts (Jones and Hunter, 1995). The experts selected for this research covered a range of different roles within the scope of the study. However, the countries in which the role of the panellists is based are not representative, hence expanding the study to integrate other countries could provide additional insights. Another limitation of the Delphi method is the feedback system, which might pressure into creating consensus. Nonetheless, the anonymity guaranteed in this study reduces such risk by eliminating the fear of having conflicting opinions (Skinner *et al.*, 2015). Furthermore, it is criticised for the way in which consensus is reached, as it is not possible to assume it is correct. To overcome such limitation, Jones and Hunter (1995) suggest identifying a match of the outcomes of the Delphi process with real-life events. Hence, future studies could analyse fashion case studies in order to test the applicability of the definition developed.

The contribution and the dynamics among the panellists of this study provide insightful avenues for further research. Research could explore the meaning of personalization and customization from a consumer perspective in order to identify whether their perspectives are aligned with the industry. Moreover, a construct of personalization could be developed through a survey and by adopting statistical techniques such as structure equation modelling. Thanks to the sophisticated technologies, retailers have access to, future studies could research how to make personalization more interactive for individuals by making it an integral part of the customer experience, also taking into consideration ethical concerns.

From this study, it emerges that the granularity level of personalization is also important, hence future research could identify the levels of personalization preferred by consumers' groups or for various categories of fashion products. Finally, the size of a company is suggested to be important for personalization process as small businesses offer more possibilities for personalization. Yet, as mentioned by another panellist, bigger companies could have more resources compared to smaller companies. Hence, research regarding the characteristics of the companies that offer personalization services might provide insightful findings for retailers.

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5.2.3 Digital fashion communication: an explorative study of fashion newsletters

Published manuscript:

Nobile, T.H. & Cantoni L. (2021). Digital Fashion Communication: An Explorative Study of Fashion Newsletters. In: Soares M.M., Rosenzweig E., Marcus A. (eds) Design, User Experience, and Usability: Design for Contemporary Technological Environments. HCII 2021. Lecture Notes in Computer Science, vol 12781, 326-339. Springer, Cham. https://link.springer.com/chapter/10.1007/978-3-030-78227-6_24

Abstract. The retail sector is experiencing a time of change due to technological advances; also consumer habits are changing. This process of change has been accelerated by the Covid-19 pandemic, which is impacting individuals' daily lives. Digitalization is not only impacting consumers' shopping habits but also the communication between brands and consumers.

This study focuses on email marketing, in specific fashion brands' newsletters. The top 50 apparel brands according to the 2020 brand finance are utilized as a sample. It emerges that most brands have a newsletter, showing that it is still an important and widely utilized form of communication.

Then, it analyses the messages utilized to drive individuals' subscription. Three main themes are identified, cognitive, emotional and financial. Moreover, the information collected for the subscription process is registered. This allows to gain an insight into the personal information collected. Subsequently, it conducts a benchmark of the confirmation emails received. In total thirty-four confirmation emails are analysed, both the subject lines and the content. Interestingly, low levels of explicit personalization are found within the analysed messages.

Overall, this study shows the relevancy of newsletters and provides suggestions for future research.

Keywords: Fashion Communication, Email Marketing, Newsletters, Personalization.

1. Introduction

Digitalisation is having a significant impact on society and businesses. Due to digital advances, the retail sector is undergoing a time of change, which is resulting in new opportunities and challenges. Also, consumer habits and desires are changing within the omnichannel environment. Consumers desire avant-garde interactions with brands and are willing to experiment more, leaving behind their favourite brands for new experiences. Hence, fashion firms are searching for new ways to integrate digital and physical experiences to better meet consumers' desires [1, 2].

The Covid19 pandemic is accelerating such transformation, forcing fashion brands to embrace digital advances and consumer changing habits [3]. To provide a full digital experience, brands are looking at innovations such as social shopping, gamification and personalisation. Moreover, in a time of pandemic and forced distancing regulations, the inaccessibility of physical stores is being addressed by technologies such as virtual and augmented reality to find original ways to integrate the human touch within the online experience and engage shoppers.

Now more than ever, agility is essential for successful marketing [4]. In such context and competitive market, developing and maintaining a relationship with shoppers on a regular basis is crucial for the success of a brand. Retailers have a vast choice of innovative communication tools to reach consumers, yet traditional tools such as emails are still widely utilized. The number of email users globally is expected to increase to 4.48 billion in 2024 from 3.9 billion of 2019 and the number of emails sent daily is forecast to grow to 347 billion [5].

Companies have long utilized emails to connect with consumers and create an asynchronous conversation. Email marketing has been widely adopted as it enables to reach a wide audience at a relatively low cost, and to engage consumers [6]. Despite its advantages, developing an email strategy/campaign can be challenging, as many elements should be carefully developed, from the content, the format and the design.

During the Covid19 pandemic the use of emails has intensified; firms have been utilizing emails to connect with their consumers and send comfort messages during the time of crisis to develop a sentiment of empathy [7]. However, this risks in resulting in a vast

number of unsolicited emails in an individual's inbox and creating a sense of frustration and unsatisfaction [7]. The issue of information overload in the digital context is not a new phenomenon, hence developing effective and efficient forms of communication is essential [6].

As the online fashion sector continues to grow, it is crucial to understand the development of the digital communication strategies adopted by fashion retailers [8]. This study aims to gain an insight into fashion retailers' email communication strategy by analysing some of their pull and push elements. In particular, for the pull strategy, it analyses the *stimuli* or calls to action in the form of messages utilized to invite individuals to subscribe to their newsletter. For the push strategy, it analyses the content of the emails sent by the brands as a confirmation for the successful subscription. The top 50 apparel brands ranked by brand value in 2020 are utilized as a sample for this study [9].

2. Literature Review

2.1 Email Marketing

Developing and maintaining relationships with consumers has become increasingly important for firms in such a competitive retail environment. Hence, firms are implementing customer relationship management strategies aimed at managing existing and potential customers [10]. Various elements contribute to building a customer-oriented strategy; amongst them the literature shows the benefits of an active communication strategy [11]. Firms can utilize different kinds of media to communicate, engage, and build a relationship with consumers through a mixture of "paid", "owned" and "earned" media [12]. This research focuses on a type of "owned media", namely email marketing. Moreover, firms can utilize pull and push communication strategies. Pull marketing communication implies that consumers have control over the messages they receive [13], thus email marketing can be considered a pull marketing strategy when consumers have control over the messages they receive by actively deciding to which newsletters they wish to subscribe to. However, following the subscription, email marketing can be considered a push form of communication, as individuals do not have full control over the messages received.

As stated by Pavlov et al. [14 p.1193] “email is part of a complex social system”, hence it requires in-depth research. Moreover, to our knowledge, limited research has been conducted on fashion newsletters, hence the fashion field has been selected for this study. Email marketing represents an important tool for a firm’s digital strategy. It involves sending advertising messages with email accounts to either specific user accounts or mass messaging [15, 16]. A way to classify emails is to differentiate between spam and permission-based emails. In contrast to spam emails, permission-based email marketing requires an individual to opt-in and allow marketers to send them advertising content. As individuals do not expect emails from brands to which they have not provided consent through subscription, they usually perceive negatively spam emails [16]. This study when discussing email marketing refers to permission-based email marketing. In particular, it focuses on newsletters, which involve establishing an ongoing dialogue with consumers.

Due to its extensive use, email marketing is sometimes considered as an “old” form of communication compared to more recent forms such as social media. Yet, it is adopted for multiple purposes due to the advantages it offers retailers [11, 17]. It enables to deliver information to a large audience at a relatively low cost and create an asynchronous conversation between the firm and the individual [18]. Additionally, it represents a tool for consumer empowerment through consumer ubiquity, as individuals can access the information anywhere and anytime and they can share the information with other consumers without the involvement of the firm. The opt-in feature to obtain permission before sending a newsletter also enables to empower individuals [19]. By exploiting technology advances, email marketing can be utilized to increase interactivity, for example by embedding alternative forms of content such as videos, and drive traffic to the firm’s website and other channels [17, 16]. Moreover, the opening of email messages and all further activities on them (e.g.: clicking on a link and eventually buying a product) can be fully traced, yielding to a rich information about addressees’ interests and practices.

However, due to information overload, sending the newsletter to the recipient is not sufficient, as it is challenging to gain consumers’ attention and reach the desired results. To overcome this challenge, firms are introducing strategies such as A/B testing to check

which are the most effective messages, or personalised content, in order to create a better appeal for each recipient [14].

Despite its advantages, creating a successful newsletter campaign can be demanding [20]. The different aspects of a newsletter design are shown to be important for newsletters effectiveness and consumer responses. The content in itself is not sufficient to attract consumers' attention [20]. Other elements contribute to its effectiveness, such as the location of the content. For example, the position and the number of links are shown to be crucial for consumer click-through rate, with links positioned at the left of a newsletter to be more effective than those positioned at the right and those at the top to be more effective than those at the bottom [20]. Thus, both psychological aspects and visual elements of a newsletter should be taken into consideration for optimal design, as they all contribute to information processing [18, 20].

2.2 Newsletter Personalisation

Emails risk of being perceived as invasive and intrusive. Additionally, navigating the vast amount of information can be overwhelming for individuals. Hence, firms are increasingly looking at personalisation in order to attract consumers' attention and provide relevant information facilitated by technology advances [21, 22].

Personalising a communication for an individual involves sending messages tailored to his/ her characteristics or preferences [22]. To do so, different types of information can be utilized, such as an individual's personal information and/or product information [23]. Personal information is generally collected by retailers though pull marketing strategies. Whereas, in emails, product personalisation involves sending emails with products that match consumers' preferences. Such types of product-based emails can be explicit or implicit. The former type makes explicitly clear to the individual the reason for which he/she is receiving the suggestion, the latter type does not disclose the match between the product and the preferences, hence the individual might not be aware of the personalisation which has taken place [24].

Research has focused on the effects of personalised greetings. It is suggested that individuals are more likely to engage with emails which include an individual's personal

information, such as the name. Addressing an individual by name compared to a generic version, has provided positive evaluations by individuals [23]. For example, emails with the individual's name in the subject line in the context of charitable donations purposes had higher open rates and higher donations compared to emails with a name mismatch [25]. However, negative effects have also been identified for personalised greetings. Such negative responses have been found to be moderated by familiarity with a firm. Whereas, consumers are shown to respond positively to implicit product personalisation. Hence, it is suggested that privacy concerns may be the reason for the negative responses [24]. Similarly, Munz [25] suggests that recent studies have more positive results compared to older studies because individuals are less concerned with privacy issues. Also, justification, which involves explaining the use of personal information for the offer suggested and perceived utility from the consumer, has been suggested to mitigate an individual's reactance to the personalised messages in emails [22].

Firms can utilize different personalisation strategies. In Human Computer Interaction studies, they are distinguished in implicit and explicit profiling methods. The explicit approach elicits the information directly from the individual, for instance through a questionnaire. Hence, individuals are generally aware how the information provided influences their interaction with the company. Whereas, implicit personalisation is based on an individual's responses to the firm's persuasive attempts. In such case, the individual might not be aware of the personalisation and how the information is utilized [26]. This study solely focuses on explicit personalisation. It analyses if and to what extent fashion apparel brands collect individuals' personal information during the subscription process and if it is utilized as part of the email confirming the subscription.

3. Methodology

A benchmark analysis has been conducted to analyse the content of the newsletters and compare them. The benchmark technique was developed to identify the industry practices that lead to the best performances. The goal of identifying the best practices is that a firm can then implement them in their own business [27, 28]. The benchmark technique has also been applied to evaluate online channels and understand the dynamics of a specific

sector. For example, it has been utilized to analyse the website of a specific organization in order to measure it against other websites and identify its strengths and weaknesses [28].

The benchmark technique was applied to fashion newsletters in order to gain an insight into such practice. The top 50 apparel brands from the brand finance directory 2020 were utilized as a sample for this study. The subsequent section provides details regarding the process followed.

Firstly, their websites were checked for the presence of a newsletter. When present, the messages utilized by the brands to motivate individuals to subscribe were registered. A quantitative analysis of such messages was conducted through a word frequency count performed with the tool Nvivo. Then, two researchers, a male and a female, subscribed to the newsletters. When possible, during the subscription process, the sex was chosen accordingly. A grid was developed to classify the information collected by the brands from the subscription process. Finally, the emails confirming the subscription were collected and analysed. An analysis of the content of the subject lines was conducted with Nvivo. Then, a table was developed to classify the contents. The table included the indicators to describe the type of contents identified. It was developed through an iterative process. Each newsletter was analysed one at the time to find the indicators that enabled to classify all the contents; whenever a new indicator was identified, it was retrospectively searched for in the newsletters already analysed.

Such process also enabled to identify whether the explicit personalised information as the salutation or the name provided while subscribing was present in the newsletter. Moreover, the involvement of two researchers allowed to compare the messages received. In terms of messages, it also allowed to identify any differences in the contents depending on the personal information provided, for example the sex.

4. Results

The results are presented in three main sections: firstly, the strategies in the form of messages utilized to drive individuals to subscribe to the newsletters; secondly, the

information collected by the brands during the subscription process; lastly, the content of the confirmation emails received following the subscription.

4.1 Strategies utilized to get subscriptions

Forty-six of the fifty apparel brands selected for this study have a newsletter.

Only four – Next, Chow Tai Fook, Anta, and Primark – do not have a traditional newsletter. However, this does not exclude their presence online through other online channels or a different approach to email marketing. The brand Next provides the possibility to create an account, which involves the collection of personal information and the option to opt-out from receiving by email sale and other information relating to Next Group. Chow Tai Fook has a "Club newsletter". However, it is not necessary to sign-up to it in order to view it, as there is an archive of all the newsletters accessible to everyone on the website in the membership programme section. Whereas, Anta, which includes a portfolio of brands, does not have its own newsletter, yet this does not exclude that the brands part of the portfolio have a newsletter. Finally, a newsletter system was not identified on the website of Primark, which, due to its main audiences, might have decided to focus on social media channels.

From the sample of the forty-six apparel brands which offer a newsletter, it emerges that fashion brands utilize different ways to invite individuals to subscribe. Nine of the forty-six brands utilize pop-ups on their website to invite individuals to sign-up. Whereas, the others provide the option without pushing the individual, who can subscribe when navigating the website.

The most frequent words identified in the motivation messages are "newsletter" (19), followed by "get" (17), "sign (up)" (17) and "subscribe" (14). Some of these brands limit the message to such essential information. Whereas, other brands add information to highlight the positive implications that could derive from subscribing with words such as "latest" (11), "updates" (11), "first" (10), "exclusive" (9) and so on.

4.2 Data collected to subscribe

This section focuses on the data collected by the brands when subscribing to the newsletter other than the email address.

Table n. 1 shows the information that the brands either collect or do not collect.

Table 1. Information to subscribe

Information collected	**Yes**	**No**
Gender	23	23
Name	11	35
Surname	10	36
Country / postal code	10	36
Type of products	5	41
Date of birth	4	42
Captcha	4	42

The most frequent type of information brands ask for regards the gender. This type of information is collected by asking the title or the sex. These were checked for mutually exclusiveness; those brands which collect information regarding sex do not ask individuals for their title and vice versa. As from these types of information the brands collect similar knowledge regarding the individual, in this analysis all are grouped under "gender". Then, it emerges that brands are interested in the individuals' name and surname and information regarding the location in the form of country or postal code. Fewer brands collect individuals' preferences regarding the type of product they wish to receive, their date of birth, and use captcha to verify the subscriber is human. Moreover, an interesting case to highlight is that of the brand Rolex, which has the option "Please send me a copy as well". This option allows to subscribe not only yourself, but also someone else.

4.3 Confirmation message

This section provides the results from the analysis of the confirmation emails received post-subscription. A total of thirty-four brands sent a confirmation email. Although the

subscription to the newsletters was conducted in English, three confirmation emails were received in other languages, French or Italian. When possible, the contents of the emails received by the two researchers from the same brand were compared. For the brands for which only one email was received for analysis, this single newsletter was considered as part of the sample.

4.3.1 Subject lines

Nvivo was utilized to find the most frequent words within the subject lines of the newsletters, then words in French and Italian with the same meaning were added to the count manually (table 2). From this set of data, the most frequent message is a general "welcome" message. Other brands send a similar message by highlighting a sense of belonging to the brand community "You're in" or "You're On the Squad". The second most frequent word is "subscription", followed by "newsletter", and "confirmation". In the subject line, no personal identifiable information provided during the subscription is present.

Table 2. Subject lines word frequency

Word	**Count**
Welcome	15
Subscription – Iscrizione – Inscription	11
Newsletter	10
Confirmation	4

4.3.2 Newsletter content

From the analysis of the newsletters' contents, eleven themes are identified. The first theme identified is that of double-opt in. Three brands sent an email requiring a double opt-in, action to be taken by clicking on a link/button. As most brands do not utilize the double-opt in option, the first newsletter received is that of an introductory email to the brand's mailing list.

Of the thirty-four messages, nine have opening greetings. This theme classified as opening regard messages, includes the salutation messages utilized to introduce the newsletter, such as “Dear Valued Dior Client”, “Dear Customer”, “Dear newsletter subscriber”, and a French greeting “Bonjour”. Of these greetings, four were personalised in different forms as follows:

- “Dear Mr/Ms. name and surname”: from a brand that collected title, name and surname
- “Dear name and surname”: from a brand that collected title, name and surname
- “Dear surname”: from a brand that collected title, name and surname
- “Dear name”: from a brand that collected name

A theme connected to this one is the closing regard messages, which includes a closing salutation identified in ten emails, such as “Sincerely, Your OMEGA Team” and “With love, Pandora”.

A total of thirty-one of the thirty-four emails include an introduction message to the brand newsletter. This message can take different forms: an explicit confirmation message of the successful subscription, welcome messages and/or thank you messages. The presence of these messages is not mutually exclusive.

Only three brands include an explicit confirmation of the successful subscription, which explicitly mentions the subscription such as “You’re subscribed” or the more elaborated “Congratulations! You have successfully subscribed to receive our emails”.

Twenty brands utilized explicit welcome messages to introduce the individual to the brand, such as “We’re delighted to welcome you” and “We’re happy you are here”. Only one brand addressed the welcome by name.

Moreover, nineteen brands show their gratitude by thanking the individual for joining the newsletter “Thank you for choosing to be a part of the Valentino universe.”

Five brands also insert their brand mission in the newsletter, for example “WHO WE ARE Calvin Klein stands for self-expression. From our iconic worn-to-be-seen underwear to our effortlessly evocative denim”.

Another theme includes the type of messages the individual can expect to receive. The brands provide details regarding the type of content they will be sending and the benefits

they will receive, such as online exclusives, pre-launches, latest collections, events, exclusive offers and many more.

Then, a theme classified as personalisation. This theme does not include the personalisation conducted by the brand, rather the invitation from the brand to provide personal information "Tell us more about yourself" and to create a personal account "Personalise your shopping experience by registering in My Account. You will be able to save your favourite items, addresses and card details, and verify the status of your orders and returns at any time".

Another theme identified is that of the discount code/gift/benefit provided the brand. These are the advantages that brands promise the individuals in order to motivate them to sign up.

Finally, a theme classified as "other" includes all those messages provided by brands to stay in touch, such as "discover more" messages, social media accounts, contact information, legal and privacy information, and unsubscription. Brands offer individuals the possibility to unsubscribe from the newsletter to stop the communication flow and in some cases they also provide the chance to modify the communication flow by selecting some personalised preferences.

5. Discussion

The advancement of digital technologies is enabling the development of sophisticated communication tools. Hence, firms have many communication outlets to reach consumers, yet it can be challenging to gain individuals' attention, which is divided across many channels [29].

This research focused on newsletters. Although, email marketing has been considered as an "old" form of communication, the study shows that traditional newsletters remain an important tool to reach consumers, as the majority of the fashion brands from the study sample have a newsletter. It is also important to specify that the few brands without a traditional newsletter have an online presence.

Firstly, this study examined the messages utilized to drive individuals to subscribe to their newsletter. While in general the overall driver is having a personal and unique relation

with the brand, becoming known by it and familiar with it, provided motivations can be grouped in three major themes: cognitive, emotional and financial, as presented in table 3.

Table 3. Main drivers to subscribe

Themes	**Drivers / reasons why**
Cognitive	*Completeness*: know everything should be known *Currency*: know before others (*vs.* FOMO)
Emotional	*Exclusiveness*: get a relation others cannot get *Discovery*: enjoy discovering the unexpected
Financial	*Pay less*: get discounts or receive special conditions/promotions

The cognitive theme refers to the factual positive implications that individuals will benefit from subscribing to the newsletter. Individuals can expect to receive "updates" (11) and "news" (10), stressing the timing aspect by being the "first" (10) to receive the information from the brand. Some brands do not specify which kind of updates, whereas others provide further details "Sign up for email updates on the latest Burberry collections, campaigns and videos." Firms appeal to consumers' fear of missing out (FOMO), a widely utilized tactic to stimulate an individual to action [30], in this case subscribing to the newsletter.

Then, some brands utilize emotional motivations. This is reflected in different terms adopted in the messages by the brands. Some stress the benefit of receiving something "exclusive" (9) and "special" (7), and the sense of discovery ("discover", 4). Brands utilize messages to elicit emotions [29]. These terms can be considered as an attempt to create a connection with the individual. In such a competitive retail market, developing a relationship with customers is essential [2].

Lastly, a financial theme is identified. This emerges from terms such as "offers" (6) "Sign up for emails to get special news and offers from the Nike family of brands."

Secondly, the study focused on the information collected by the brands for the subscription process. Brands collect mainly personal details such as gender, name, surname, country, and date of birth. In terms of preferences they only collect information regarding the type

or category of products the individual is interested in receiving. Overall, it emerges that brands are not interested in collecting many types of information other than basic personal details. That might be due to several reasons. Among them: lowering the threshold to subscription (the more you ask, the higher the risk that a person leaves the subscription process), reducing legal obligations, not knowing (yet) how to use such data.

Thirdly, newsletters are considered to be easy to personalise [14]. Hence, this study analysed the content of the thirty-four emails received by the brands for confirming the subscription. Interestingly, not all the brands that collect some kind of personal details include them in the conformation newsletter. The gender is not utilized to tailor the content for the recipient and not all the brands that collect the name and/or surname include it in the communication. Although the newsletters do not present a high level of explicit tailoring, brands appear to be interested in personalisation as a frequent theme identified in the welcome newsletters is the invitation to provide further personal information and an invitation to create a personal account.

Moreover, the contents of the newsletters show a clear connection with the cognitive, emotional and financial themes identified in the motivational messages to drive subscription: the cognitive theme is identified in the information regarding what the subscriber can expect to receive; the emotional theme is reflected in salutation, the welcome, and thank you messages as they are arguably used to create a connection with the individual; the financial theme revealed by the discount code and gift information. These types of contents are in line with the literature findings, according to which emails are considered less intrusive when they offer value to the individual by providing product information, entertainment or some kind of financial reward [16].

6. Limitations and Future Research

This study provides an insight in the newsletter subscription practices adopted by apparel brands from the messages utilized to drive consumers' subscription process to the confirmation email. Results add to the understanding of online interactions between companies and their stakeholders, and can inform better practices by communication managers.

The results should however be considered also with their limitations. Firstly, the sample size is limited to 50 apparel brands, hence expanding it could provide further insights. Moreover, the images and the emojis are not considered in the analysis. Future research could include such information. Furthermore, not all personal information could be analysed, such as the use of the date of birth as the birthday dates inserted occur subsequent to the data collection for this study. Also, only explicit information was considered. Thus, further research could focus on the use of both explicit and implicit personalisation strategies within fashion brands' newsletters. Online behavioural insights will be fundamental for the e-commerce growth of fashion brands [31], thus research on individuals' online behaviour and the way in which such information can be utilized for personalisation and its effectiveness could provide valuable insights to firms' communication strategies.

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Annex

	Brands
1	Nike
2	GUCCI
3	Adidas
4	Louis Vuitton
5	Cartier
6	ZARA
7	H&M
8	Chanel
9	UNIQLO
10	Hermes
11	Rolex
12	Dior
13	COACH
14	Tiffany & Co.
15	Chow Tai Fook
16	Victoria's Secret
17	Burberry
18	Anta
19	Ralph Lauren
20	Prada
21	Ray-Ban
22	The North Face
23	Levi's
24	Omega
25	Armani
26	Under Armour
27	Bulgari

28	Old Navy
29	Moncler
30	Puma
31	Michael Kors
32	Saint Laurent
33	Primark / Penney's
34	NEXT
35	Tommy Hilfiger
36	Calvin Klein
37	Skechers
38	Hugo Boss
39	TAG Heuer
40	New Balance
41	Pandora
42	Bottega Veneta
43	Swatch
44	Bershka
45	Gap
46	Gilda
47	Converse
48	Valentino
49	Salvatore Ferragamo
50	American Eagle Outfitters

Source: Apparel 50 2020 Ranking. https://brandirectory.com/rankings/apparel/table

5.3 Personalization value

5.3.1 Personalization (in)effectiveness in email marketing

Submitted manuscript:

Nobile, T.H. & Cantoni, L. (2022). Personalization (in)effectiveness in email marketing, Journal of Applied Communication Research.

Abstract. This research explores the effects of personalization in email marketing. Although personalization is expected to positively impact customer experiences through behavioural responses, its effects on consumers' actual behaviour have not been extensively addressed, providing retailers limited guidance on how to develop personalized communication strategies. Two experimental studies were designed to test the effectiveness of personalization. Results show positive effects of personalized messages on retailers' performance while also highlighting instances of reactance. The originality of this paper lies in identifying possible causes of the contrasting effects of personalization on consumer behaviour by investigating them alongside various customers' online shopping decision making phases. It also provides managerial implications by suggesting guidelines on how to implement effective personalization in email marketing.

Keywords: personalization; personalization paradox; email marketing; customer journey; digital fashion

Introduction

The ability to personalize an online shopping experience no longer represents a "nice to have" as consumers expect to have personalized interactions with firms (Arora et al., 2021). In fact, personalization is a top priority for firms and one of the main areas of technology investment of the coming years (Amed et al., 2022). The interest in personalization is driven by the expected added value it can offer firms (Lynch and Barnes, 2020; Moran et al., 2020). A recent report shows that firms can expect a 40% revenue increase from personalized marketing tactics (Arora et al., 2021). Indeed, research has identified various positive effects of personalization, such as consumers' positive attitudes towards the brand, increased purchase intention, and willingness to pay (de Groot, 2022; Tomczyk et al., 2022). However, negative findings have also been identified, such as privacy concerns, feelings of intrusiveness, and reactance (de Groot, 2022; Tran et al. 2021; van Osselaer et al., 2020). These contrasting effects represent the paradox of

personalization and have opened an interesting debate on whether personalization represents an effective strategy (de Groot, 2022; Goic et al., 2021; Aguirre et al., 2015). Such paradox has been explained through the privacy calculus, where the benefits have to outweigh the costs in order for personalization to be effective (Bol et al., 2018; de Groot, 2022). Recent research has started analysing the conditions under which personalization benefits outweigh the costs. The way in which consumers' data is collected (Zeng et al., 2021), the level of personalization (Walrave et al., 2016), the trustworthiness of the platform on which the personalized message appears (van Ooijen, 2022), contextual factors such as the time at which the message is received by the addressee (Salonen and Karjaluoto, 2019), and individuals' characteristics (Schreiner et al., 2019) have been identified among the factors that impact personalization effectiveness. Due to the many factors affecting personalization, open questions remain on how personalization should be implemented as part of a communication strategy (Goic et al., 2021; Hayes et al., 2021; Kalaignanam et al., 2021). This study aims to address such issue with a focus on email marketing.

Email marketing is selected to study personalization effectiveness as it is widely adopted by firms and it offers many opportunities to personalize the interaction between a retailer and a consumer as potentially any aspect can be tailored to the addressee's characteristics and preferences (Goic et al., 2021; Nobile and Cantoni, 2021). Although a message that matches the characteristics of the addressee is expected to increase its elaboration (Petty and Cacioppo, 1986), it could backfire, for example if it provokes privacy concerns (White et al., 2008), thus the extent to which a message should be personalized in order to be effective requires further research (Walrave et al., 2016).

Beyond the content, also the time at which newsletters are sent can be personalized. These are called triggered emails, as they are automatically sent in accordance to a consumer's action or state, for example after having placed a product in the online basket without concluding the purchase (Goic et al., 2021). Although widely adopted to reach consumers at the right time of their customer journey, their effectiveness has yet to be determined (Goic et al., 2021).

Hence, this study aims to build on the open debate of personalization effectiveness by investigating its effects in email marketing and by studying different levels of personalization as part of consumers' experience.

In specific, this research aims to answer:

RQ1. Is personalization effective in email marketing?

RQ2. Are messages personalized at higher levels more effective than messages personalized at lower levels?

RQ3. Is personalization effective during the whole customer journey or does it perform differently at various phases?

Effectiveness in this study is measured in terms of the relational performance metrics of open and click-through, and the transactional metric of purchase. As suggested by Hayes et al. (2021), to better understand the effects of personalization, it is necessary to measure actual rather than self-reported behaviour. Thus, two field experiments are conducted in order to measure personalization effectiveness. The first experiment analyses the effects of personalization in an email campaign. The second one extends the findings by identifying the effects of different levels of personalization and its interplay with three customer journey phases in triggered emails.

The subsequent section presents an overview of personalization and email marketing. This is followed by the presentation of the two experiments and their results. The paper concludes with theoretical and managerial implications, study limitations, and future research directions.

Literature Review

Personalization (In)effectiveness

Previous research has studied personalization in order to understand whether and to what extent personalized messages exceed general messages' performance (Li, 2016; de Groot et al., 2022). On one hand, there are compelling arguments in support of its benefits. A message that matches some characteristics of an individual is expected to be more persuasive than a non-matched message and to capture an individual's attention (Petty and Cacioppo, 1986; Tran, 2021). Personalization makes individuals feel unique (Vesanen,

2007), it creates strong customer-brand relationships (Goic et al., 2021), it boosts customer brand engagement, which in turn enhances brand equity, brand usage intention, and referral behaviour (Tran et al., 2021). In general, it is suggested to improve the overall customer experience (Tyrvainen et al., 2020). On the other hand, personalization is not without risks (Villanova et al., 2021). Although limited research has focused on its negative consequences, personalization has been found to backfire by creating sentiments of aversion and increasing privacy concerns (Hayes et al., 2021; Teeny et al., 2020). The diverse effects identified emphasize the need to further research the potential effectiveness of personalization (Riegger et al., 2021; de Groot et al., 2022; Tomczyk et al., 2022).

Email Marketing and Personalization

Email marketing remains among the most popular direct marketing communication tools utilized by retailers to reach consumers (Goic et al., 2021). An added value of email marketing lies in its potential to contribute to a personalized online shopping experience, while allowing for a wide reach (Nobile and Cantoni, 2021). On one hand, email marketing could positively influence consumers by being perceived as a firm's attempt to build a relationship; on the other, it could be perceived negatively as an attempt to manipulate their choices (Vafainia et al., 2019). In order to overcome the latter, retailers are relying on finely grained personalized emails to send relevant content (White et al., 2008). To do so, they need to collect individuals' data, a process which is deemed critical for the (un)success of personalization (Aguirre et al., 2015). Data can be obtained overtly, when the individual is aware that their data is being collected, or covertly, when the individual is not aware (Aguirre et al., 2015).

Overt data collection

A type of overt data collection in permission email marketing is self-disclosure, which involves an individual's proactive act of providing personal information to a retailer, for example through subscribing to a newsletter. This is a useful method to overcome the personalization-privacy paradox as it requires the individual's consent to share personal data (Zeng et al., 2021).

Among the information collected overtly and utilized by firms to personalize the message is the individual's name (Tran et al., 2021; Nobile and Cantoni, 2021). It has been found that when individuals spot their name in an email, they pay more attention to the message (Maslowska et al., 2016) resulting in higher probability of opening rate, which in turn generates higher click-through rates, increases sales, and reduces un-subscriptions (Heerwegh et al., 2005; Sahni et al., 2018; Munz et al., 2020). However, opposite findings highlight the inability of greetings with personal identifiable information to trigger positive responses due to privacy concerns (Wattal et al., 2012; Li and Liu, 2017).
Experiment 1 of this study aims to contribute to this debate by identifying the effects of personal greetings on open and click-through rates.

Covert data collection and triggered emails

Technology advances are enabling new methods to collect data from consumer behaviour by leveraging on information from different channels. This allows retailers to automate the process of sending messages in response to an individual's behaviour (Goic et al., 2021). These messages called "triggered emails" can be considered as a type of personalization as they implicitly respond to a person's action.
To date, there is little evidence on the impact of triggered emails on consumer behaviour. Browse abandonment triggered emails are shown to increase revenue compared to not receiving a message (Goic et al., 2021). Moreover, Zhao et al. (2020) found that reminding shoppers to clean their basket can provide positive effects such as purchase intent.
Experiment 2 aims to build on this by testing the effects of triggered emails at different phases of consumers' shopping journey.

Personalization levels

Both the subject line and the body of an email can be personalized at different levels depending on the number of personal attributes inserted in the message. The "best level" of personalization which adds value without being perceived by the individual as "creepy" and as an attempt to manipulate has yet to be identified (Walrave et al., 2016). On one hand, higher levels of personalization, identified as including the highest number of

personal references, are shown to perform the best (Kalyanaraman and Sundar, 2006; Tam and Ho, 2005; Walrave et al., 2016). On the other hand, White et al. (2008) identify emails with high distinctiveness to be only equal to, not higher than, low distinctiveness messages in terms of click-throughs.

A message with a higher number of personalized attributes might require less processing from the individual and have positive effects. In contrast, it might have negative effects as it could be perceived as too intrusive (Walrave et al., 2016). Arguably, the group of personalized attributes included in the message could partly explain the contrasting results identified in the literature. Thus, it is argued in this study that it is crucial to research not only the type of information but also the group of information that triggers positive responses.

Experiment 2 of this study tests three personalization levels in triggered emails.

Personalization and Context: Customer Journey

While the content and the design elements are important for the success of an email, other factors such as temporal dynamics, meaning the time at which a message is sent as part of the customer journey, interplay to determine its effectiveness as consumers' preferences change across time (Salonen and Karjaluoto, 2019; Kumar, 2021; Song et al., 2021). Hence, it is crucial to understand how personalization strategies can be utilized to influence decision making at different phases of the shopping journey (Varnali, 2018; Lynch and Barnes, 2020).

Online shopping enables retailers to track consumers during their shopping journey. For example, it is possible to track when an individual has searched for a product with no further action or has added it to the cart (Goic et al., 2021). Such information can be utilized by retailers to accompany the individual during the shopping journey through personalized triggered messages. Tam and Ho (2005) show that personalized recommendations are more effective at an early decision-making phase when the decision funnel is more open to new information compared to later ones.

Nonetheless, previous studies have neglected to further research the relationship between personalization and various customer journey phases in triggered email marketing (Goic

et al., 2021). As personalization does not occur in silo, studying its effects as part of consumers' shopping journey could help overcome the contrasting effects identified in the literature (Bleier and Eisenbeiss, 2015).

Experiments

Two experiments were conducted in order to measure the effects of personalization on consumer behaviour. This methodology was selected as it enables to measure actual rather than self-reported reactions, which is essential to advance the research on personalization effectiveness (Viglia and Dolnicar, 2020).

Experiment 1

Study design and procedure

Experiment 1 was designed with the fashion brand Old Captain Co., which produces shirts Made in Switzerland. The aim of this experiment was to reach a first understanding on the effects of personalization on open and click-through rates in an email campaign. The brand sends monthly newsletters with company updates to its subscribers. For this single factor between-subject experiment, the newsletter of October 2021 was utilized. It involved all the brand's customers who have an online account with the brand and are subscribed to the newsletter. Personalization effects were tested with two types of messages, a personalized and a standard one (control group). Participants were randomly assigned to one of the two experimental conditions in a casual manner.

Stimuli

The personalized version greeted the individuals by their first name in the subject line and in the body of the message. Whereas the standard version greeted the individuals with a general "Dear Wanderers", which is used by the brand in its monthly newsletters. The remaining of the message was kept identical for both versions.

Analysis and results

A total of 663 messages were sent, of these 330 to the control group and 333 to the treatment group. Table 1 reports the descriptive statistics. While a small positive difference is identified between the number of messages opened in the control and the treatment groups, one-way ANOVA results revealed such difference was not statistically significant ($p > .05$).

Table 1. Descriptive statistics experiment 1

	Standard messages (Control group 330)		Personalized messages (Treatment group 333)	
	Freq.	**%**	**Freq.**	**%**
Bounce rate	2	0.6	3	0.9
Open rate	162	49.4	177	53.6
Click-through rate	29	8.8	30	9.1
Unsubscription	2	0.6	3	0.9

Discussion

One's name is expected to positively resonate with individuals and provide effective outcomes (Petty and Cacioppo, 1986). This study shows that greeting an individual by name has a minor, yet not significant, difference on open-rate. It could be that adding one's name to a message is not sufficient to trigger an individual's response as it affects the cognitive rather than the affective experience, which has a higher effect on behavioural response (Barari et al., 2020). Moreover, Old Captain Ltd. is a niche brand formed by a small community. The high degree of familiarity might drive the individual to mostly ignore the presence of the personal greeting as, when receiving the email, the individual already associates it with the company, providing it an intimate tone despite the presence or absence of the name.

Previous studies suggest that the inability to trigger positive reactions derives from privacy concerns. Whereas positive brand associations (Munz et al., 2020), firm familiarity

(Wattal et al., 2012), individual's involvement with the product (Li and Liu, 2017) as well as when the name is voluntarily provided by individual (Sahni et al., 2018) reduce negative responses. In this study, the name was voluntarily provided by the individual, who is also familiar with the brand. This might explain the absence of negative effects.

Experiment 2

Experiment design and procedure

Experiment 2 was designed with a company in the sector of products for children and new mothers, which wishes to remain anonymous. This study, conducted in the Italian market, was designed to measure the effects of three levels of personalization on open, click, and purchase. Moreover, the variable of customer shopping phase was observed. Personalization was manipulated on three levels, described as "low", "medium", "high".

To be selected for the study, customers had to:

(i) be subscribed to the company's newsletter

(ii) have an online account with the company

(iii) log into their account between September 10, 2021 and November 3, 2021 to search for a product on the company's website

The emails were triggered two hours after the search on the website's search bar of one of the top 20 keywords from year 2020/21.

Individuals were randomly assigned to one of the three experimental conditions. Furthermore, it was observed in which decision making phase the customers found themselves. Three phases were identified: phase 1 involved the search of a product on the company website and a "light" product evaluation; phase 2 involved the search of a product and a "thorough" product evaluation; phase 3 involved the search of a product, adding the product to the cart, and not checking out. The transition between phase 1 "light" and phase 2 "thorough" evaluation depended on the number of seconds an individual spent on the product detail sheet; the cut off was set at 58 seconds, which is the visitors' average stay on product pages of the company, thus staying longer than the 58 seconds was considered as thorough evaluation. When considering the position of an individual, phase 2 ruled over phase 1 and phase 3 ruled over phase 1 and 2.

Stimuli

Three messages (in Italian language) were designed to reflect the three levels of personalization. Messages were "call to action" triggered emails inviting the addressee to go back to the shopping journey from where she/he left off. To manipulate the levels of personalization, previous research was followed, according to which a level can be defined based on the number of personalized placeholders, with lower levels having fewer personalized placeholders and higher levels having more (Walrave et al., 2016). Hence, the three levels should not be considered in absolute terms, but in comparison of each other. Messages with the lower personalization had no personalized placeholders, they were only triggered based on the individual's phase. The messages personalized at the medium and higher levels added personal placeholders as indicated in table 2.

Table 2. Personalized placeholders in triggered message

Customer Journey		**Medium Personalization**	**Higher Personalization**
Phase 1: "light" product evaluation	**Subject line**	a. Name	a. Name b. Address
	Body	a. Name b. Image linked to product searched	a. Name b. Image linked to product searched c. Date last purchase d. Address
Phase 2: "thorough" product evaluation	**Subject line**	a. Name	a. Name b. Address
	Body	a. Name b. Image(s) linked to product(s) searched	a. Name b. Image(s) linked to product(s) searched c. Date last purchase d. Address
Phase 3: cart abandonment	**Subject line**	a. Name	a. Name b. Address
	Body	a. Name b. Link to basket	a. Name b. Image(s) linked to product(s) in basket c. Date last purchase d. Address

Manipulation check

Manipulation checks are essential for experimental design (Viglia and Dolnicar, 2020). To test the stimuli, a pre-test was conducted through an online survey on Qualtrics in order to verify whether the three levels of personalization were perceived and ranked differently by individuals. The participants were asked to imagine three scenarios, which reflected the three customer journey phases previously defined. For each scenario three types of

messages were described. Respondents were asked to compare these messages in terms of personalization and position them on a bar from not to highly personalized. Thirty-eight responses were collected.

Firstly, the messages were analysed to identify whether they ranked differently independently from the customer journey phases. A statistically significant difference was identified between the three levels (low, medium, high) as determined by one-way ANOVA ($F(2,339) = 290.583$, $p = .000$). Then, it was measured whether the three messages were ranked differently on the scale from not to highly personalized and results show that the messages of each scenario were ranked differently. A statistically significant difference was identified between the messages of scenario 1 as determined by one-way ANOVA ($F(2,111) = 90.754$, $p = .000$); of scenario 2 ($F(2,111) = 116.375$, $p = .000$) and of scenario 3 ($F(2,111) = 89.363$, $p = .000$).

Analysis and results: descriptive statistics

The company sent 2453 messages to unique customers. Of the messages, 79 were not successfully received and 71 bounced back. Hence, 2303 cases were considered for analysis. The sample is formed by 1974 females, 58 males, and 271 unknown gender. Gender distribution reflects the typical female customer base of the company. Age ranged from 19 to 71 years old ($M = 35$, $SD = 6.4$).

Table 3 reports the distribution of the messages randomized based on the three personalization levels and the distribution of the number of individuals in the three phases. Of the 2303 observations, 64% opened the message, of those who opened it, 18% clicked, and of those who clicked 39% purchased. Table 4 provides the open, click, and purchase rates distributed according to personalization levels.

Tables 3. Distribution: personalization levels and customer phases

Personalization level	**Freq.**	**%**
Low	790	34.3
Medium	752	32.7
High	761	33.0
Customer phase		
Light evaluation	517	22.4
Thorough evaluation	1195	51.9
Abandoned cart	591	25.7

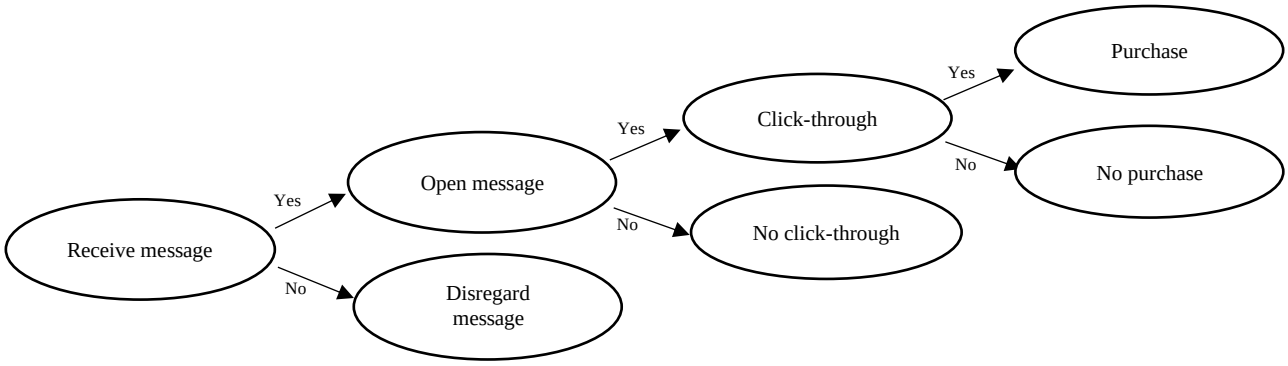
Table 4. KPIs

	Low personalization (790)		Medium personalization (752)		Higher personalization (761)	
	Observations	%	Observations	%	Observations	%
Open	486	61.5	504	67.0	477	62.7
Click	82	16.9	91	18.0	88	18.4
Purchase	36	43.9	39	42.8	26	29.5

Analysis and results: logistic regression

This experiment can be described as a sequence of steps (graph 1). Once the message is received, the addressee can either open or disregard the message. If the message has been opened, the customer can click or not on product links. Then, if the individual clicks, she/he can purchase or not a product. Therefore, a sequential logit model was utilised to analyse the data as it enables to estimate the relationship between the explanatory variables of personalization and customer journey phase and the odds of passing each transition, from open to click to purchase.

Graph 1. Sequential model



The sequential logit model was estimated through the robust seqlogit package by Buis (2015) on Stata. Moreover, the effects of age were measured as a continuous variable. To test the model, 66 observations for which the age is unknown were eliminated, resulting in 2237 valid observations. Table 5 provides an overview of the results.

The model is statistically significant (prob > chi2 = 0.0067).

Results (appendix A) reveal that:

- being in phase 3 (cart abandonment) increases the probability of opening the message compared to being in phase 1 and phase 2 (Odds ratio (OR) = 3.77, $p < .1$).
- a medium personalization level increases the probability of open compared to a lower and higher level (OR = 2.93, $p < .1$)
- an increase in age increases the probability of opening (OR = 1.04, $p < .05$). Whereas an increase in age decreases the probability of opening when in phase 3 (OR = .96, $p < .1$).
- being in phase 2 (thorough evaluation) decreases the probability of clicking compared to being in phase 1 and phase 3 (OR = .14, $p < .05$).
- an increase in age increases the probability of clicking when in phase 2 (OR = 1.05, $p < .05$).
- a high personalization level decreases the probability of purchase compared to a lower and medium level (OR = .00, $p < .05$)

- an increase in age increases the probability of purchase for high personalization (OR = 1.12, p < .05).

Subsequently, the model was run a second time by adding the interactions of personalization and phases. The model is statically significant (prob > chi2 = 0.0025). Results (appendix B) show that:

- the interaction of medium personalization with phase 3 (OR = .57, p < .1) and high personalization with phase 3 (OR = .52, p < .1) decrease the probability of open
- the interaction of high personalization with phase 2 (odds ratio = 3.31, p < .05) and phase 3 (OR = 3.05, p < .05) increases the probability of click.

Table 5. Results overview

	All Phases	**Phase 1**	**Phase 2**	**Phase 3**
All personalization	If age increases open rate increases		Click-rate decreases; If age increases click-rate increases	Open-rate increases; If age increases open-rate decreases
Low personalization				
Medium personalization	Open-rate increases			Open-rate decreases
Higher personalization	Purchase rate decreases; If age increases purchase-rate increases		Click-rate increases	Click-rate increases; Open-rate decreases

Discussion

Experiment 2 provides insightful results regarding the effects of personalization in triggered email marketing performance.

Interestingly, increasing the level of personalization in triggered emails does not increase opening rates. In contrast to the experiment by Walrave et al. (2016) which found that the highest level of personalization performs the best, this study finds that in email marketing a medium level of personalization increases the probability of opening. Adding further personalized placeholders does not have any impact on open. In an information rich environment, individuals scroll through the emails quickly, hence, a subject line that matches some personal attributes captures an individual's attention (Petty and Cacioppo, 1986), whereas adding further personalized attributes does not increase elaboration. Moreover, individuals might preview only a portion of the message while disregarding the remaining text due to their email interface settings.

Additionally, contrary to expectation, higher levels of personalization decrease the probability of purchasing. Previous studies found that browse abandonment triggered emails influence purchase intent and increase revenue compared to not receiving any message (Goic et al., 2021; Zhao et al., 2020). Arguably, when adding personalized elements to triggered cart abandonment emails, the message is perceived as too pushy or it creates a sense of guilt, resulting in negative effects on purchase probability.

However, with the increase of age, an increase of purchase probability is found for higher personalization. According to the persuasion knowledge model people's experience with persuasion attempts and their ability to cope with persuasion attempts increases throughout life (Friestad and Wright, 1994). Hence, it could be that cart abandonment triggered emails with a higher number of personalized placeholders are perceived as useful as individuals' age increases. Such finding highlights the importance of considering also individuals' characteristics when developing personalization strategies.

Interaction of personalization and customer shopping journey phase

According to configuration theory, an outcome is rarely explained by single factors and it is usually explained by a combination and interaction of factors (Pallant et al., 2020). The

interaction of personalization with an individual's customer journey phase provides further elucidations regarding personalization effects.

In accordance with the literature, shopping cart warnings can provide positive effects (Zhao et al., 2020), yet adding personalized placeholders to shopping cart warnings both at medium and higher levels is counterproductive for open as it could be perceived as an excessive persuasion attempt. Moreover, the online basket might be adopted for reasons other than purchase intent (Close and Kukar-Kinney, 2010). As found by Sundstrom et al. (2019) the sole act of browsing and adding products to the basket might provide instant gratification. Hence, in these scenarios personalization might not be a relevant motivator to open the message.

Furthermore, if personalization alone had no effect on click-through rates, the interaction of higher levels of personalization with phases two and three provide significant results. Due to the high cost of collecting information consumers often "satisfy", thus receiving personalized information helps reduce the cost of searching for other information and simplifies information processing (Kumar, 2021). Additionally, according to the persuasion knowledge model, when individuals perceive the topic to be relevant and the agent from which they receive the persuasion attempt to be trustworthy they are more likely to ignore their persuasion knowledge and accept the personalized message (Brinson and Eastin, 2016), such as in this case where the individual has opened the message. Hence, the individual uses simple rules to make inferences such as "if the company addresses me personally, the message is relevant for me" (Tam and Ho, 2005). In the case of a higher personalization level, the individual easily has access to information to make various inferences, triggering positive outcomes such as click-through. Whereas this is not sufficient to trigger a purchase response. Individuals are not always able to evaluate all the options available and many online purchases are made impulsively (Song et al., 2021; Ampadu et al. 2022), thus, personalization is expected to have positive effects on consumer behaviour. However, the company selected for this experiment offers mainly products for children and new mothers. Therefore, when shopping with this company, it could be that shoppers act as rational individuals, who consider aspects such as product

quality and price, valuing the cognitive component of the shopping experience more than the affective one (Barari et al., 2019).

To summarize, the results suggest that focusing solely on personalization provides a narrow view of its effects, rather the interplay of various factors is necessary to measure its effectiveness.

Theoretical and managerial implications

Hereafter, theoretical and managerial implications of both experiments are discussed.

Theoretical Contributions

This study contributes in several ways to personalization literature. First, it responds to the need to further understand the effectiveness of personalization by investigating contextual factors. Although the results show that personalization can enhance message effectiveness, both experiments demonstrate that personalization does not always improve the effectiveness of a message performance.

This study reveals that the interplay of a consumer's shopping phase with personalization should be considered when analysing its effectiveness as empirical results show that under certain shopping circumstances it can even negatively impact message effectiveness. While previous research has highlighted contrasting results of personalization (Goic et al., 2021; Tyrvainen et al., 2020; Kalaignanam et al., 2021; Hayes et al., 2021), this study suggests a new dimension, the one of customer shopping phase, in order to partly explain the different effects.

As stated by Riegger et al. (2021), the studies that emphasize personalization ineffectiveness focus mainly on privacy concerns and utilize theories related to perceived risk in order to justify such results, suggesting overt data collection to overcome the personalization-privacy paradox (Zeng et al., 2021). In this research, individuals have engaged in an act of self-disclosure by subscribing to the newsletter and creating an account. Yet, findings show that it is not sufficient to overcome negative effects of personalization.

According to social exchange theory, consumers in the data exchange process with retailers weight the benefits and the risks and might be willing to provide their personal information for relatively small rewards, such as a discount (Pallant et al., 2020). Hence, despite being subscribed, they might not be interested in all kinds of personalized messages.

Second, this study builds on self-referencing theory and the need to identify the information and group of information that activate self-referencing (Maslowska et al., 2016) by testing different levels of personalization. Findings suggest that adding a higher number of personalized information does not always increase message effectiveness. Finally, although personalization is expected to attract attention of all consumers, this study highlights age as one of individuals' characteristics that might partly explain the contrasting results of personalization.

Managerial Implications

There is a clear need of research that can support managers in implementing personalized communication strategies. In this direction, the study provides discerning suggestions for managers.

Generally, retailers should desist from adding too many personalized attributes in their email campaigns as it could result in counterproductive effects. Managers should consider including only attributes that could benefit the consumer. For example, in the subject line adding the name could be beneficial for big retailers to provide a "human tone" to the email. Whereas adding other personal information in the subject line could be perceived as too intrusive; similarly for the body of the message as it could negatively affect purchases by resulting too pushy.

The findings also highlight the relevance of contextual factors when sending personalization emails. Consequently, managers, to optimize personalization effectiveness, should take into consideration the decision making stage of the customer. Managers should leverage on personalization when customers are further on in their shopping journey, as it improves click-through rates, suggesting that it can help their decision making process.

Furthermore, retailers should actively collect information from their customers. For example, this research shows that age could be an interesting variable to take into consideration when developing personalized messages; thus, rather than relying on mass personalized strategies, managers should identify the characteristics of their consumers who are more likely to react favourably to personalization and develop their communications accordingly.

Conclusion, Limitations and Future Research

This study provides valuable insights into personalization effectiveness. Notwithstanding the contributions of this research, there are some limitations that provide fruitful avenues for future research.

First, this research is limited to the Italian and Swiss-Italian markets. Future studies should consider expanding the research to identify any salient cultural differences.

Second, it measures only one individual characteristic, age. Studying other individuals' characteristics could provide interesting findings. For example, individuals in geographical regions with different income levels could have distinctive behaviour.

Also, for experiment 2, it could be that consumers searched for products online yet purchased offline. Hence, when measuring transactional metrics, consumers' omnichannel shopping journey could be considered.

Furthermore, personality variables are not taken into consideration in the experiments. For instance, for high involved consumers, who desire to find a connection with the brand (Lynch and Barnes, 2020), the effects of personalization might be different compared to less involved shoppers. Future research should strive to identify different types of consumers, who would appreciate personalization in their communications.

Finally, it examined only some of the many personalization types and levels in email marketing, hence it would be compelling to examine different possibilities in order to identify their effectiveness.

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Appendix A. Model 1

Outcome **Non-open vs Open**	**Odds Ratio**	**Robust Std. Err.**	**z**
Phase			
Phase 2	1.764	1.110	0.90
Phase 3	3.767	2.796	1.79*
Pers_level			
Medium	2.929	1.787	1.76*
High	1.079	.655	0.13
Age	1.041	.018	2.21**
Pers_level#Age			
Medium	.974	.016	-1.46
High	.997	.017	-0.12
Phase#Age			
Phase 2	.976	.017	-1.34
Phase 3	.964	.020	-1.75*
Outcome **Non-click vs Click**			
Phase			
Phase 2	.141	.131	-2.11**
Phase 3	.454	.455	-0.79
Pers_level			
Medium	1.529	1.395	0.47
High	.847	.776	-0.18
Age	.998	.025	-0.07
Pers_level#Age			
Medium	.989	.025	-0.41
High	1.006	.025	0.25
Phase#Age			
Phase 2	1.054	0.26	2.06**
Phase 3	1.038	.028	1.38
Outcome **Non-purchase vs Purchase**			
Phase			
Phase 2	1.363	2.709	0.16
Phase 3	1.544	3.308	0.20
Pers_level			
Medium	.572	.936	-0.34
High	.005	.011	-2.56**
Age	.988	.055	-0.21
Pers_level#Age			
Medium	1.016	.045	0.36
High	1.129	.061	2.23**

Phase#Age			
Phase 2	.995	.055	-0.07
Phase 3	1.005	.059	0.10

Note. Pers_level = Personalization level; *p < .1 **p < .05.

Appendix B. Model 2

Outcome **Non-open vs Open**	**Odds Ratio**	**Robust Std. Err.**	**z**
Phase			
Phase 2	1.851	1.218	0.94
Phase 3	5.239	4.015	2.16**
Pers_level			
Medium	2.876	1.847	1.64
High	1.525	.982	0.65
Phase#Pers_level			
Phase2#Medium	1.103	.305	0.36
Phase2#High	.688	.186	-1.37
Phase3#Medium	.568	.185	-1.73*
Phase3#High	.518	.167	-2.04**
Age	1.039	.018	2.13**
Pers_level#Age			
Medium	.977	.017	-1.30
High	.997	.017	-0.12
Phase#Age			
Phase 2	.977	.017	-1.26
Phase 3	.966	.020	-1.61
Outcome **Non-click vs Click**			
Phase			
Phase 2	.095	.094	-2.38**
Phase 3	.470	.496	-0.71
Pers_level			
Medium	1.413	1.342	0.36
High	.361	.355	-1.03
Phase#Pers_level			
Phase2#Medium	1.630	.715	1.11
Phase2#High	3.313	1.606	2.47**
Phase3#Medium	.784	.361	-0.53
Phase3#High	3.047	1.478	2.30**
Age	1.005	.024	0.22
Pers_level#Age			
Medium	.988	.024	-0.46

High	1.004	.025	0.17
Phase#Age			
Phase 2	1.049	.027	1.88*
Phase 3	1.029	.029	1.03
Outcome Non-purchase vs Purchase			
Phase			
Phase 2	3.503	7.670	.57
Phase 3	2.820	6.680	.44
Pers_level			
Medium	.689	1.156	-0.22
High	.001	.005	-2.37**
Phase#Pers_level			
Phase2#Medium	.562	.472	-0.69
Phase2#High	1.662	2.164	.39
Phase3#Medium	.838	.716	-0.21
Phase3#High	3.810	4.851	1.05
Age	1.006	.059	0.11
Pers_level#Age			
Medium	1.019	.045	.43
High	1.135	.065	2.21**
Phase#Age			
Phase 2	.975	.056	-0.42
Phase 3	.983	.062	-0.27

Note. Pers_level = Personalization level; *p < .1 **p < .05.

5.3.2 Perceived personalization and critical success factors in digital fashion communication: an insight from fashion consumers

Submitted manuscript:

Nobile, T.H. & Cantoni L. (2022). Perceived personalization and critical success factors in digital fashion communication: an insight from fashion consumers, International Journal of Communication.

Abstract

This study explores perceived personalization in the online fashion retail context. Adopting an explorative qualitative research approach, it collects consumers' experiences with personalization through focus groups, offering novel insights to perceived personalization literature. The contributions of this study are threefold: firstly, it contributes to the ongoing discussion on interpersonal and mass communication with a focus on perceived message personalization by supporting the stream of research that stresses the importance of the receiver's perception in determining the extent to which a message is personalized in computer mediated communication. Secondly, it advances the construct of perceived personalization by identifying the conditions under which individuals perceive fashion communication to be personalized. Thirdly, it provides a comprehensive overview of perceived personalization critical success factors. These contributions provide also managerial implications by offering insights on how to deploy personalized communication strategies.

Keywords: personalization; perception; interpersonal communication; mass communication; critical success factors; digital fashion

Introduction

Technology advances are shaping fashion, a rich and dynamic sector, which is undergoing an important digitalization process, accelerated by the Covid19 pandemic (Voyer and Ko, 2021; Grewal and Roggeveen, 2020; Cantoni et al., 2019). The impacts of the digital transformation are evident across its value chain on various levels, including the ways in which products and services are designed, produced, communicated, marketed, and also their effects on culture and society (Nobile et al., 2021; Noris et al., 2020).

In such digitally transforming fashion sector, which has forced many firms to re-evaluate their digital presence and strategies, personalization is attracting the interest of both academics and practitioners as it is expected to overcome some of the challenges that are being faced by consumers, such as the difficulty in taking decisions due to choice overload and the overflow of often irrelevant information (Nobile and Cantoni, 2021). Indeed,

personalization, even though it is not a new phenomenon, thanks to digital advances it offers unprecedented opportunities to develop and provide products that fit consumers' taste and style, for example through configurators that allow to choose from a variety of predefined alternatives for various product features and on demand production (Särmäkari, 2021; de Bellis et al., 2013; Fiore et al., 2004). Furthermore, they enable to interact with individuals in a personal way (Mansell and Steinmueller, 2022; Nobile and Kalbaska, 2020; Lee, 2020; Verhagen et al., 2014). Fashion firms are harnessing on artificial intelligence and big data advances in order to personally interact with customers in CMC settings as if they were in physical stores and to deliver ad-hoc information, making it an interesting sector to explore personalization (Amed et al., 2022).

Various CMC personalization strategies are being adopted by firms, for example addressing the message recipient by name in newsletters (Nobile and Cantoni, 2021), employing virtual customer service agents that resemble humans (Verhagen et al., 2014), and communicating through chatbots (Chung et al., 2020). However, conveying a personal feel through CMC remains a challenge (Verhagen et al., 2014). A stream of research argues that such challenge is a result of the addressee's message perception (O'Sullivan and Carr 2018; Li, 2016). O'Sullivan and Carr (2018) suggest that the message sender designs the message with a level of personalization in mind, yet the way in which the message is perceived by the addressee determines whether and to what extent the message is personalized, making it difficult to objectively define personalization. Although scholars have identified the importance of perception in message personalization, research from a consumer perspective has been neglected. The potential of personalization lies in being a customer-oriented strategy (Montgomery and Smith, 2009), hence, this study aims to advance the concept of perceived personalization in CMC by identifying the conditions under which consumers interpret an object as personalized.

Interestingly, personalization is usually presented as a win-win for both firms and consumers, as it is expected to positively influence message recipients through increased attention and engagement. Yet, negative effects such as consumers' privacy concerns, feelings of intrusiveness, and vulnerability have also been identified (Grigorios et al., 2022; Mansell and Steinmueller, 2022; Schreiner et al., 2019; Nobile and Cantoni, 2021).

Scholars have focused on identifying those factors that firms should consider in order to deliver successful personalization and avoid negative effects, identifying various critical factors at each step of the personalization process (Vesanen and Raulas, 2006; Schreiner et al., 2019; Li, 2016; Pappas et al., 2018; Tran, 2021; Song et al., 2021). Yet, limited research has addressed the factors which consumers consider as critical for successful personalization. Arguably, due to the previously noted subjective nature of personalization (Li, 2016; O'Sullivan and Carr, 2018), an examination of the factors which are important for its success from a consumer perspective will be crucial to reach a holistic understanding of personalization. Hence, this study aims to advance the conceptualization of perceived personalization by identifying its critical success factors from a consumer perspective.

To summarize, this study aims to contribute to interpersonal mediated communication research by further developing the understanding of perceived personalization in light of digital advances.

Literature Review

The literature review is structured as follows: firstly, it introduces the relevance of researching personalization in computer mediated communication by discussing the ways in which, supported by digital advances, it challenges the traditional notions of interpersonal and mass communication. Then, it introduces the concept of perceived personalization and its critical success factors.

Personalization: Interpersonal and Mass Communication

CMC was initially largely associated to interpersonal communication. Only at a later stage, with the advent of the Internet, it was extended to mass communication (Morris and Ogan, 1996; Verhagen et al., 2014; Lee, 2020). In the communication field, interpersonal communication is traditionally presented in opposition to mass communication. Interpersonal communication is defined as "two- way, nonmediated message exchange between a very small number of participants (usually two), who have personal knowledge of each other" (O'Sullivan and Carr, 2018 p. 1162). Largely associated to face-to-face

interactions, it has been extended to mediated communications, for example to channels such as the telephone and email. Whereas mass communication is defined as a one-way communication delivered to an unknow large audience and it is usually associated to channels such as the radio and television (O'Sullivan and Carr, 2018). In the 1980s-1990s communication scholars, in light of digital advances such as the Internet, started challenging the rigid distinction between interpersonal and mass communication, arguing that it was not based on any solid theoretical foundation and that new ICTs did not fit within the boundaries of mass and interpersonal communication as traditionally conceptualized due to the fact that digital advances were blurring the divide (O'Sullivan and Carr, 2018; Flanagin, 2017; O'Sullivan, 1999). The traditional criteria adopted to distinguish between mass and interpersonal communication such as one-way versus two-way; mass and unknow audience versus small and well-known audience could no longer describe the new media (O'Sullivan, 1999; Flanagin, 2017; O'Sullivan and Carr, 2018). As a result, a stream of communication research has focused on understanding the meaning of interpersonal and mass communication in mediated communication, advancing the idea that the type of communication is not determined by the channel through which it is delivered, as new media, for example social media, enables one-to-one, one-to-few, one-to-many, and many-to-many forms of communication to both known and unknow audiences.

In response to the need to rethink the meaning of mass and interpersonal communication, O'Sullivan and Carr (2018) developed a new model, the masspersonal communication model, according to which the dimensions of perceived accessibility and message personalization determine the type of communication. Perceived accessibility refers to the extent to which the addressee perceives the message to be accessible at a given time; whereas message personalization refers to the extent to which the addressee perceives the message as reflecting his/her characteristics. Moving away from the dichotomy between one way versus two way communication and small versus large audience, an updated definition of interpersonal communication is provided as "communication activities high in personalization and low in message accessibility" and mass communication as "communication activities low in personalization and highly accessible" (O'Sullivan and

Carr, 2018 p. 1167). As it emerges from such definitions, personalization has a central role in understanding communication practices in the current digital information society and it questions previous assumptions of communication research.

Perceived Personalization

Personalizing a message implies creating a match between a firm's offering and a consumer's preferences and needs, affective and cognitive states, goals, attitudes, identity and personality, and cultural orientation (Teeny et al., 2020). Implementing personalization is complex as it is a dynamic and cyclical process formed of various connected elements: the process starts from identifying the customer and his / her personal data, which can be collected from external sources or online interactions. Then, data is processed to create a customer profile from his / her preferences based on which an output is delivered to the customer through different possible channels. Due to various factors involved, the process of creating the match is not always straightforward (Vesanen and Raulas, 2006). A major challenge derives from identifying individuals' preferences as they might not always be aware of their own true preferences, they might change them over time, or they might not even have any preferences at all for certain decisions. Moreover, also in the case in which a match is achieved between the firm's offering and the individual's preference, the personalized object might still not be perceived as personalized as there are many factors that influence an individual's perception. The type and amount of personalized information in the message, the way in which the message is framed, the time at which it is sent and received, and the channel through which it is sent are all factors that impact an individual's perception (Li, 2016). Building on the importance of perceptions, Li (2016) introduces the constructs of actual and perceived personalization and suggests that a message is personalized only when it is perceived as such by the individual independently of whether it is actually personalized or not. A message intentionally personalized by a firm for an individual might be perceived as general, whereas a general message might be perceived as personalized by the addressee. The importance of the construct of perceived personalization lies in its ability to partly explain and elucidate the complexity of the personalization process and the challenge in

determining personalization effectiveness as it is how the message is perceived by the individual to determine whether a message is "personalized" or not (Li, 2016; O'Sullivan and Carr, 2018). As shown by Song et al. (2021), providing recommendations which are not perceived as personalized by individuals could result in negative feelings and the personalization could result intrusive and useless. Although from the literature the concept of perceived personalization emerges as crucial, this study identified a lack of research from a consumer perspective. Arguably, as a subjective feature of communication (Li, 2016; O'Sullivan and Carr, 2018) research from a consumer perspective could be crucial in advancing the conceptualization of perceived personalization. Therefore, this study aims to identify the conditions under which fashion consumers perceive a communication to be personalized in order to reduce the possible retailers' error of providing a personalized offer that is not actually perceived as such by the addressee.

Thus, the first research question addressed in this study is:

RQ1. Under which conditions do consumers perceive an object to be (or not) personalized in fashion?

Furthermore, previous research suggests that the valence meaning of a match, which refers to whether the message is interpreted as positive or negative, represents another challenge in determining the effectiveness of personalization (Teeny et al., 2020). A message might be perceived as personalized by two individuals, yet personalization might be interpreted as positive by one and as negative by the other. Identifying the conditions under which an object is personalized is necessary but might not be sufficient to advance the construct of perceived personalization. Thus, this study aims to also identify the valence attached to perceived personalization in order to understand which personalization is perceived as positive and which one as negative by fashion consumers.

Personalization: Critical Success Factors

Research has identified both positive and negative effects of personalization, concluding that personalization is not always a successful strategy and that it requires a well-defined strategy in order to be effective and benefit the consumer. Therefore, as briefly introduced in the previous sections, scholars have focused on identifying those factors that firms

should consider in order to deliver successful personalization, identifying various critical factors at each step of the personalization process, from the collection of data to the delivery of the personalized communication (Vesanen and Raulas, 2006; Schreiner et al., 2019; Grigoris et al., 2022), which are hereafter discussed.

The way in which individuals' data is collected and treated through the customer journey is found to be of the utmost importance (Morimoto, 2021; Pallant et al., 2022). It is suggested that overt data collection methods, which imply consumers' awareness that their data is being collected, should be preferred over covert data collection methods, which do not entail consumers' awareness (Grigorios et al., 2022). Once the data has been collected, to create the match it is necessary to consider (i) the quality of personalization, which refers to how well it addresses customers' needs; (ii) the message quality, which indicates the accuracy of information; (iii) the added value that it brings to customers (Pappas et al., 2014), and (iv) the usability of the system (Murray and Haubl, 2009). Furthermore, the context, the temporal dynamics, and the channels through which personalization is sent have been extensively presented as crucial factors (Salonen and Karjaluoto, 2019; Huang and Zhou, 2018; Ho et al., 2011; Schreiner et al., 2019; Bleier and Eisenbeiss, 2015). Then, once the personalized object has been delivered to the individual of interest, his / her traits, personality, emotions, and cultural orientation (Pappas et al., 2018; Shin et al., 2022) are shown to affect his / her comfort level with personalization. Although the literature presents various critical factors of personalization, a comprehensive overview of them from a consumer perspective is lacking. Building on the subjectivity of personalization (Li, 2016; O'Sullivan and Carr, 2018), it is suggested that identifying the critical success factors from a consumer perspective could advance the understanding of perceived personalization. This study adopts the definition of critical success factors by Williams and Ramaprasad (1996, p. 251), who define them as "being necessary and sufficient for success; each factor is necessary, and the set of factors is sufficient".

Hence, this study aims to address the following research question:

RQ2. What are the critical success factors for effective personalization from a consumer perspective?

Methodology

This study employed focus groups as they enable to collect information regarding consumers' experiences, feelings, perceptions, and also highlight differences in perspectives regarding a topic of interest (Rabiee, 2004; Nguyen et al., 2022). Purposive sampling was adopted, reaching individuals from the researchers' university network in Switzerland, who had experience with online shopping for fashion items and were aware of online personalization. Such criteria enabled to create a synergy between participants and made them comfortable in sharing their experiences.

A research protocol was followed for consistency (Table 1) and iterative questioning was utilized to verify that the moderator properly understood the opinions shared. Focus groups were conducted on university premises between October and December 2021. Eight focus groups formed of four to six individuals were conducted, adding up to forty participants, including master students, Ph.D. candidates, and collaborators. Thirty-two were females and eight were male, the average age was 26, the youngest being 21 years old and the eldest being 41. Each focus group lasted between 45 and 75 minutes. The focus groups were audio-recorded and manual transcriptions were performed.

The analysis started through the familiarization with the transcripts via in-depth reading. Two researchers independently coded two transcripts. Then, a coding guide was jointly developed by the two researchers; while the codes' definition has been done mostly in a bottom-up fashion, found codes have been organized firstly according to their belonging to (a) cognitive or (b) emotional dimensions, then cognitive dimensions have been further organized into (a1) quality of personalization and (a2) message quality (Pappas et al., 2018).

This coding scheme was applied by a researcher to all the transcripts by indexing codes through the comment function. Finally, to guarantee intercoder reliability, both researchers discussed the final outcome.

Table 1. Focus groups research protocol

Research Protocol
Welcoming, research brief, and participation consent forms.
Online shopping behaviour: experiences, frequency, benefits, and drawbacks.
Actual experience with personalization: interaction, usage, experiences with online fashion personalization.
Actual experience with personalization: benefits, challenges, issues from their actual experiences with personalization.
Mediated experience with personalization: "dream personalization", expected factors that would enhance their experiences with personalization.

Study Findings

This section presents the findings according to the three themes which emerged from the focus groups: perceived personalization, critical success factors, and data sharing.

Perceived Personalization

This section presents the results regarding the conditions under which an object is perceived as personalized by individuals in computer mediated exchanges with a fashion firm (Figure 1). Firstly, an individual either attributes to the firm the intention to personalize an object or not.

This study only elaborates on the case in which the individual attributes to the firm the personalization attempt. A firm could implement personalization but the individual might not identify it. Such situation is not elaborated in this research as the data collected through the focus groups concentrated on individuals' experiences with personalization.

A general agreement emerged among the participants that personalization should offer a value added to their online browsing and shopping experience, for example as stated by a participant: *"*[I like it] *when they say 'this might be your size according to your last purchase', it might be helpful, but if they want to push* [a product] *I don't like it".* Fashion consumers believe personalization should have a clear reason and should not "just be there": *"I like it when I purchase something and then underneath my purchase there is for example a discount for me…not that like every day I receive 50 emails 'oh look you may*

like this'". Overall, individuals perceive an object to be personalized if it adds a cognitive, an emotional or a combination of both dimensions to the object. As a result, the individual has a positive feeling towards personalization. If the object is perceived as personalized but there is an issue in the personalization process the individual experiences positive and negative feelings. For example, an individual might perceive a newsletter with a personal greeting to be personalized as it adds an emotional dimension to the message, yet the timing at which the message is received might be perceived as annoying, hence the individual experiences mixed feelings. *"I want them* [referring to personalized suggestions] *to be there for me when I'm doing it* [referring to shopping], *not bombarding me because we are already overflooded with information".*

Whereas the object will not be perceived as personalized if the individual believes that it does not add to – or even reduces – the cognitive and / or emotional dimensions. For example, a study participant states that being addressed by name in a newsletter, although it represent a firm's attempt to personalize the communication, is not personalization as *"personalization for me it's really understanding what you want and making a decision on what you want next".*

When the individual does not recognize the value added of personalization, he / she experiences neutral feelings, for example in the case when *"they* [referring to firms] *have the name and just use it"*, leading to individual's indifference. Instead, individuals experience negative feelings when they expect personalization and instead as stated by a participant *"I could just cover the name of the brand and it could be any brand that I receive a newsletter from".*

The subsequent sections further elaborate the results regarding cognitive and emotional dimensions of perceived personalization.

Perceived Cognitive Personalization

The cognitive dimension of personalization is represented by those strategies that aid the individual's shopping experience. Study participants mention three types of personalization they have experienced, which can be classified as perceived cognitive

personalization: (i) suggestions and recommendations, (ii) company updates, and (iii) filters.

Most study participants have experience with and perceive as personalized those suggestions and recommendations provided by firms based on their online behaviour. Those who like the suggestions received believe they are useful, reduce the cognitive effort, and simplify the overwhelming online shopping experience by suggesting relevant items. As mentioned by a participant *"I exploit the algorithm, I make it work for me"*. Those who recognize the firm's personalization attempt when receiving recommendations but have negative feelings towards it, believe this type of personalization limits their choice and reduces the possibility to discover new products or brands *"It does not give me the opportunity to change, it's restrictive as I have many styles and want to explore things."* Not surprisingly, most participants do not have a defined positive or negative feeling towards personalization, yet they experience mixed feelings "*It helps me choose among a bit of variety but scary they know so much"*; *"Sometimes useful and sometimes no, I feel watched".*

The mix of positive and negative feelings towards personalized recommendations are found to derive from three main factors: (i) the source of recommendation; (ii) the type of recommendation received and the way in which it is presented; and (iii) the channel through which the recommendation is received.

Generally, positive feelings are identified for suggestions which individuals believe derive from their proactive behavior, such as searching for an item. In contrast, negative feelings are associated to suggestions that react to their behaviour without having actively consulted the source, such as conversational commerce, which makes them feel as if the firm is *"mind reading"* and spying on them. Individuals believe that these types of personalization involve a high risk of misinterpretation, for example if they are talking with friends about a red dress, it does not imply they are searching for a red dress *"I don't know how they are interpreting it* [referring to the data collected]*, with what criteria so this kind of misinterpretation and not having accurate data, I just don't like it".*

The type of personalized recommendation also affects their feelings. Some appreciate receiving "more of the same" recommendations, others do not as they like to change style.

Moreover, if some participants mention that they enjoy receiving product recommendations by both fast fashion and luxury brands, others only value recommendations from luxury brands as they believe it is an extension of the service that they would receive in a luxury store. Then, the way in which the recommendation is presented is crucial: for some the firm's personalization attempt should be made explicitly clear, for example "As you liked x, you may also like y", whereas for others it is not a requirement, as long as the added value clearly emerges.

Finally, individuals perceive personalized suggestions differently also depending on the channel through which the personalized object is received. *"Nice on social media as it is a channel on which I go voluntarily, I like to go there, in contrast to email as there you have to go and look because of fear of missing out on important stuff".* Moreover, if the recommendation is received on a non-congruent channel, for example in the form of a pop banner on a website while the individual is navigating a website for work activities, it is perceived negatively.

The other type of perceived cognitive personalization mentioned is that of company updates. In particular, some individuals appreciate recall messages that explicitly mention the added value of receiving it *"We have again that dress you saw last week but there wasn't the size"*. Others perceive them as rude and pushy: *"It would be the same as having the shop assistant picking you from outside the shop and telling you: Why don't you come back and purchase?".* Finally, some participants mention filters as a type of cognitive personalization as they perceive that filters help their online shopping through the possibility of selecting characteristics of interest and filtering out irrelevant options *"I love when you can personalize your search by colour, or – as I hate the V-neck – I'm glad I can take it off* [my search]*".*

Perceived Emotional Personalization

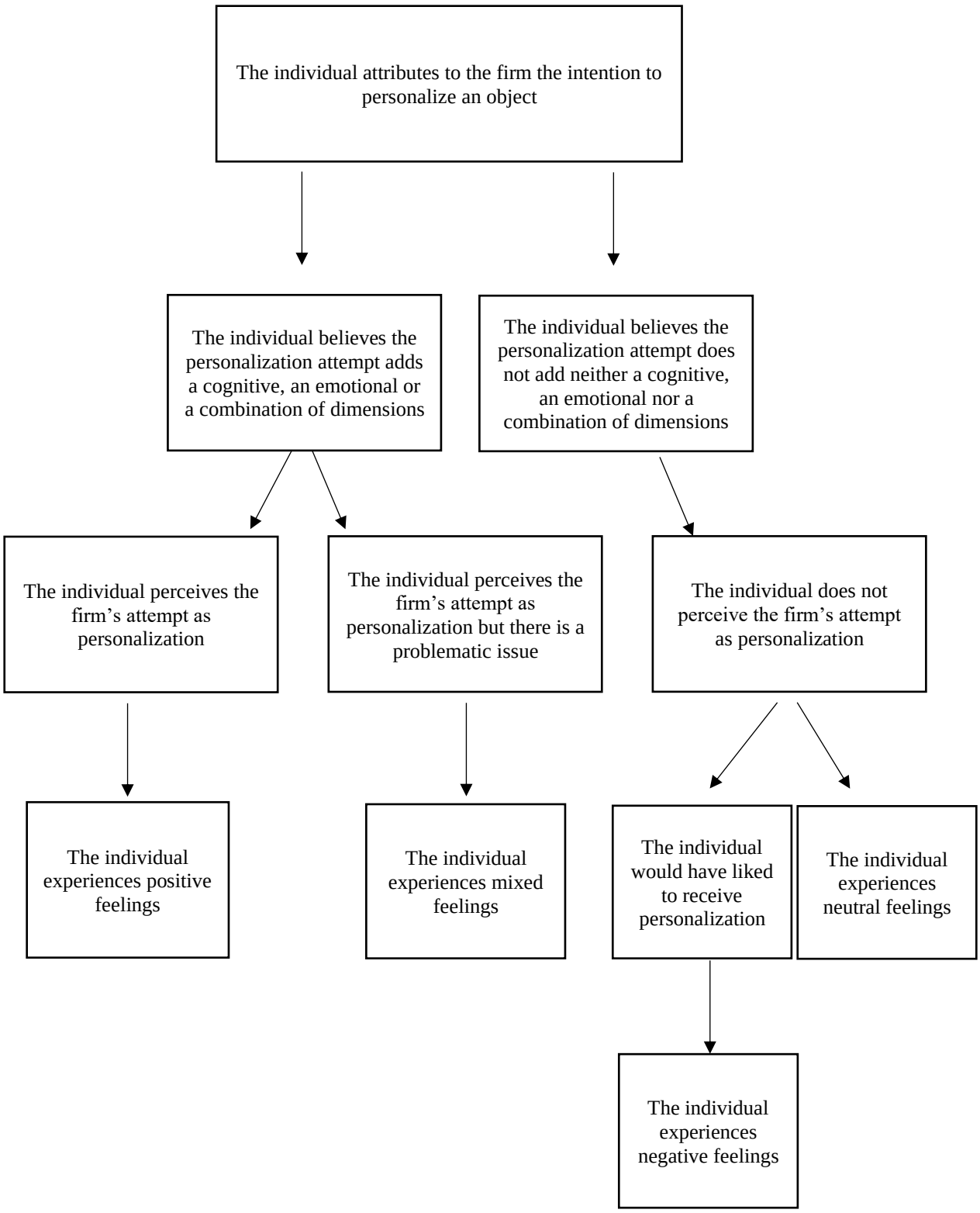
The emotional dimension of personalization involves those strategies which make an individual feel special by creating a personal connection between the firm and the consumer. Two main types of emotional perceived personalization emerge from the focus

groups: the first one refers to intangible objects, namely personal greetings, the other one to tangible objects, the ability to change the attribute of a fashion item.

Generally, individuals like receiving messages that address them by name or birthday greetings as they make them feel special. Interestingly, some do not perceive a personal greeting as a firm's personalization attempt because they believe that it does not add any value. For those individuals who only value the cognitive dimension of perceived personalization as an added value, the affective dimension alone can result insufficient. Highly appreciated by most participants are the messages which combine both an affective and a cognitive dimension, for example those which send birthday greetings and also provide a discount. Yet, a further condition of brand relationship emerges. Such messages are positively perceived when received from brands that individuals believe to have a relationship with, whereas receiving dozens of birthday messages with discounts reduces the good feelings.

Finally, the possibility to change an attribute of a tangible item is perceived as emotional personalization as it makes individuals feel they are developing a relationship with the product and a special attachment to the brand *"I can put part of my personality and it* shouts [the product] *this is me"*. Changing an attribute such as colour, print or adding initials enhances the shopping experience and also the post-purchase experience. Consumers do not only like personalizing products for themselves but also for gifts, as it is a way to express their extra effort for a special gift.

Figure 1. Consumers' perceived personalization process



Perceived Personalization Critical Success Factors

This section presents the results regarding consumers' perceived critical success factors of personalization.

Some individuals mention that despite personalization is not yet perfect and could be improved, it is still appreciated. Others have fewer positive feelings towards personalization *"It's a kind of mass personalization, they are all doing the same thing"*.

Building on Pappas's et al. (2018) dimensions of personalization cognitive perception – quality of personalization and message quality, three critical success factors for personalization quality (sense of control, quality of recommendations and information provided, and dynamism) and three for message quality (timing, quantity, and look of message) are identified (table 2).

Table 2. Personalization critical success factors

Personalization Critical Success Factors	**Personalization Quality**	Sense of Control
		Quality of recommendations and information provided
		Dynamism: firm's ability to show they know and evolve with the individual
	Message Quality	Timing
		Quantity
		Look of message

Personalization Quality

Participants stressed the importance of sense of control. The sense of control described by the participants goes beyond the appropriate use of data according to privacy conditions, it is the belief that the firm cares so much about him / her to leave them a choice. They want to have some control over when they receive personalization *"Like when I ask for this help I want to see personalization otherwise no thanks"*, and they would like to choose based on their mood or the type of search *"I mean sometimes I don't mind personalization,*

sometimes it can be helpful, so maybe it could be nice if I could say yes or no to that [referring to personalization] *depending on my mood or my researches".*

It is also suggested that a way to feel in control could derive from being able to choose the level of personalization *"We should add how much of a personalization you want, not a lot, a little bit… with a button, that would be nice".* Lack of control is perceived by consumers as an inhibiting factor *"I have a metaphor: somehow I see personalization – unwanted personalization that I haven't agreed with it – as an annoying seller in physical shops. If I enter a shop and I just want to do my thing and she comes and says: can I help you or why don't you try this or that? It is annoying as maybe I just want to wander around; instead, if I go to her and ask, I expect a service* [it is ok]*".* Also, default personalization which might appear useful from a firm's perspective might be perceived negatively by some individuals. For example, for a student who has moved to Switzerland and does not speak the national languages, being able to choose the languages herself is important for her shopping experience *"I don't speak Italian or German and every time I put Switzerland they give me everything in German and I cannot choose English – I cannot choose that I speak English and live in Switzerland".*

The second critical success factor is quality of recommendation and information provided. However, it is not sufficient for quality personalization. The recommendations provided have to be relevant according to the current shopping experience *"It would be nice if they categorize it* [referring to personalization], *like for example when I'm looking at clothes I want to look at clothes personalization. They see me on a clothes website and when I click on the page there are clothes ads that I'm supposed to buy according to you* [referring to the retailer] *but don't show me technical stuff I used to fix my bathroom".* Recommendations are believed to be of bad quality when only part of the object is personalized. For example, when a firm suggests an item in line with an individual's style, for example wide leg jeans, but the product itself is not personalized, for example the individual is into sustainability but the firm suggests jeans from a not sustainable brand. "More of the same" recommendations can also be an inhibiting factor, for example when an individual has purchased something of one colour, he / she might not want to continue receiving items of the same colour. This is highly connected to the critical factor of

dynamism. For consumers it is important that firms are able to demonstrate that they really know them throughout time *"It's like if I'm always the same person but we have so many personalities and social roles and it's just limiting to put me in a box".* A firms' inability to keep up with the consumer, for example not tracking the full shopping experience and sending suggestions related to a product that was purchased and returned, would result in highly ineffective personalization.

Message Quality

Three compelling message quality dimensions are identified: timing, quantity, and look of the message.

Receiving personalization at the right time is extremely important for individuals. Disregarding a consumer's shopping journey phase is likely to lead to inappropriate temporal dynamics, for example sending suggestions after the product or something similar has already been purchased, or the relevant context is not any longer there "*Unfortunately the problem is that usually I find it somewhere cheaper* [referring to a product] *and I've bought it before, so the timing of personalization is not the right time, it is not useful because after I bought it I receive the email".*

Moreover, regardless of the type of personalization, quantity, which refers to the number of personalized objects received, is pivotal. Receiving too many and repetitive messages could alienate consumers "*I think there should be a balance of quantity, even in private relationships if you receive 1000 messages it doesn't mean you love someone more; the same for newsletters I prefer a message of quality rather than receiving loads of useless messages that I don't even open"*. Individuals believe that they should not receive constant stimuli as too much personalization leads to annoyance *"I wake up in the morning, I'm scrolling and I see more ads than posts of people that I follow – in that moment it becomes annoying for me because it's just advertising*".

Finally, a successful personalization attempt must be able to feel natural, not creepy, and not intrusive. The look of the message should demonstrate the firm's attempt to meet the individual's interest and not just an attempt to push a product.

Firms should assure that the critical success factors identified are fully integrated in the personalization strategy and that they jointly cooperate for successful personalization in order to reduce annoying experiences such as the one presented by a study participant *"I subscribed to the* [a brand name] *watch newsletter, it's a crazy newsletter for me because they send you 2 emails per week. I bought a watch for my mum and they keep giving me discounts to buy a new watch even 70% discount but I mean I bought a watch 2 weeks ago so even if it's almost for free I don't need two watches in one week. I found it a little bit awkward and a misuse of a newsletter … it just recognized that I was looking for a watch and they didn't go a step further. I thought about unsubscribing because they were too many and I cannot receive more emails from them than my boss".*

From the focus groups, it also emerges that beyond these factors, the individual's emotions, moods, state of mind at the moment in which the personalization attempt is encountered play a significant role in determining perceived personalization effectiveness *"*[My] *feeling changes from positive to annoyance depending on mood".*

Data Sharing

Interesting results emerge regarding individuals' willingness to share their personal data with fashion firms. Only very few individuals unconditionally disclose their information for personalization, the way a participant puts it *"I'm used to it, does not bother me anymore"*. In contrast, most participants have conditions under which they are willing to share their personal data (or part of it). The findings reveal the following conditions: necessity, expected benefit, effort, brand trust, and type of data requested. Individuals share personal information when they have no choice in order to complete an action, for example to conclude a purchase when they cannot continue the transaction as guests. Then, individuals are willing to trade their personal data for small rewards, such as a discount *"I would trade my data for the discount".* A further condition of data disclosure is the effort required to provide the information. If it is too costly in terms of effort, individuals are discouraged from providing information. A couple of individuals state that the value of effort is also connected to past bad unsubscription experiences, which required more effort than expected *"They* [referring to firms] *bombard you with newsletters and you have to*

put the effort to unsubscribe". Furthermore, brand trust is highly valued by individuals for data sharing *"For me it depends on the brand, for example if it is well known is not a problem".*

Finally, noteworthy findings emerge regarding the type of data individuals are willing or not to share. Again, a difference emerges between a few individuals who are ready to share any type of data and those who are not. Those who have no restrictions either believe that firms have access to all their information in spite of their willingness or believe it is in their interest to provide the data for expected benefits. Those who are not willing to provide any type of data affirm to share factual data that does not require any or limited interpretation, such as demographics. Others mention that they weight the risks and benefits of the information provided. For example, if a firm asks for a phone number they will only provide it if they think it could add value in their interaction with the firm.

Discussion

This section discusses the findings in relation to previous personalization literature in order to highlight the study contributions.

The personalization attribution, as extensively discussed in previous research (Chen et al., 2021; Bleier and Eisenbeiss, 2015; Vesanen and Raulas, 2006), derives from a match between the object received and the individual's need, preferences, desires. This study advances such notion by advancing the conditions under which individuals perceive an object to be personalized in fashion with a focus on CMC. In fact, it corroborates the suggestion by O'Sullivan and Carr (2018) and Li (2016) that personalization is a subjective feature. Personalization, in order to be perceived as such, needs to add a cognitive, an emotional, or a combination of both dimensions to the shopping experience. In line with the findings of Li and Huang (2016), personalization should not be an obstacle for goal achievement. Indeed, as a subjective feature, the challenge is that each individual has a different opinion on the situation in which personalization adds value. For example, some highlight that personalized recommendations are extremely useful as they reduce the cognitive effort when shopping, for example by offering product suggestions and size recommendations; whereas others believe that personalization can limit their choices by

"putting them in a box". This phenomenon called "serendipity issue", according to which personalized content might reduce the possibility to discover unexpected items, has been previously identified (Zanker et al., 2019). Thus, strategies such as "mass" and "synthetic" personalization (Landert, 2014 p. 18), which adopt the same personalization strategy for all individuals should be avoided and major effort should be devoted to getting to know the preferences of each individual.

In terms of critical success factors, the study findings corroborate the research introduced in the literature review that personalization involves far more many factors than just creating a match between the message and the individual's preferences and needs (Bleier and Eisenbeiss, 2015; Li, 2016; Schreiner et al., 2019).

This study, by building on Pappas's et al. (2018) dimensions, advances such research stream by developing a comprehensive overview of the critical success factors that according to consumers are essential for successful personalization.

Receiving personalization of quality is essential for individuals. In line with previous studies, which suggest that consumers should feel in charge of their information as feelings of vulnerability derived from lack of control could lead to negative personalization effects (Krafft et al., 2017; Aguirre et al., 2015), it is found that individuals value feeling in control. Furthermore, information accuracy across time, as suggested by Li (2016), is imperative.

In terms of message quality, this study reinforces timing as a crucial factor of personalization (Salonen and Karjaluoto, 2019; Huang and Zhou, 2018) and stresses the importance of sending the messages in sync with individuals' shopping journey phases (Goic et al., 2021). According to study participants, personalization should be implemented while they are browsing and purchasing. This result is consistent with the empirical findings of Bleier and Eisenbeis (2015) that personalized banners lose their effectiveness quickly. Moreover**,** as also suggested by Tezinde et al. (2002), not paying attention to personalization quantity is in contrast to the aim of personalization of overcoming information overload.

Undoubtedly, this study supports previous research (Pappas et al., 2018) in that cognitive factors are extremely important for the success of personalization. Nonetheless, this study

shows that they are not sufficient. The individual's emotions, moods, state of mind play a crucial role in determining personalization effectiveness. Consumers rely on emotions when they are not able to take a decision (Pappas et al., 2018). Hence, emotions are a double-edge sword for personalization effectiveness. On one hand, emotions could help overcome cognitive factors shortcomings. On the other hand, emotions could be detrimental for personalization, exacerbating the challenge of delivering effective personalization.

Lastly, this study contributes to personalization privacy literature by providing an insight regarding the conditions under which consumers are willing to share personal data with retailers, which is extremely important for advancing personalization research (Lupton, 2020; Chen et al., 2021).

Extensive research has been conducted on personalization privacy and the so called privacy paradox: the discrepancy between individuals' privacy concerns in sharing data and their willingness to disclose personal information (Morimoto, 2021; Pallant, 2022; Fehrenback and Herrando, 2021). The study findings show that only very few individuals unconditionally disclose their information for personalization. Such finding is supported by the social exchange theory, according to which consumers usually evaluate the benefits and risks of providing personal data (Pallant et al., 2022). In fact, as it surfaces from this study, individuals are willing to trade their personal data for small rewards, such as a discount, a widely adopted strategy by fashion retailers in order to motivate consumers' to sign up to their newsletter (Nobile and Cantoni, 2021). Additionally, in accordance with Krafft et al. (2017), a high registration effort could prevent individuals from providing their data and, as also highlighted by Bleier and Eisenbeiss (2015), it emerges that retailers should focus on gaining consumers trust before implementing personalization strategies in order to reduce privacy concern.

Conclusion, Limitations, and Future Research

This research examined fashion consumers' experiences, opinions, and perceptions of personalization, providing relevant implications for both theory and practice. From a theoretical perspective, it contributes to the ongoing research on interpersonal and mass

communication in CMC by strengthening the conceptualization of perceived personalization and advancing its understanding as a subjective feature. It identifies cognitive and emotional dimensions as the conditions under which an object is perceived as personalized. Having identified such conditions, it was also possible to identify consumers' feelings and their valence towards different personalization types. It emerges that attributing to the firm the personalization attempt does not always imply a positive feeling. Undoubtedly, the findings show that consumers' perceptions are highly important in determining personalization effectiveness. Furthermore, this study builds on the stream of research that aims to identify the factors which affect personalization effectiveness by comprehensively classifying six personalization critical success factors from a consumer perspective.

From a practical perspective, this study provides firms an insightful guide to implement personalization strategies that are perceived as such by individuals. Arguably, taking into consideration the critical success factors of perceived personalization could help managers reduce the misfit between actual and perceived personalization. Overall, this research shows that personalization involves and creates various challenges for fashion retailers as there are many factors which could have a negative impact on consumers' shopping experiences resulting in negative feelings. However, personalization could also generate many opportunities for both the firm and the consumer if it is positively perceived by the consumer. In support of personalization as a subjective feature (O'Sullivan and Carr, 2018; Liu, 2016), this study shows that individuals have very different perceptions of personalization. Hence, looking forward, retailers wanting to implement personalization strategies should focus on getting to know their consumers.

The study findings are subject to some limitations, which could represent interesting avenues for future research. Due to the inherent characteristics of focus group research, the study lacks generalizability: while it can reach saturation – covering all or most relevant dimensions of the researched topic – it cannot weight the different elements, ranking them according to prevalence/frequency (within different groups). Consumers differ in their willingness to share data, for example, younger consumers are found to be more comfortable in data exchange (Pallant et al., 2022) and the cultural orientation affects

individuals' comfort level with personalization (Shin et al., 2022). Hence, future studies should extend the research to different age groups and cultural settings in order to identify any salient differences in consumers' perceptions of personalization. Furthermore, the digital fashion field is rapidly evolving and testing innovative technologies to implement consumers' shopping journeys. Thus, research should continue collecting consumers' experiences in order to identify the evolving conditions under which an object is considered as personalized as the strategies might become outdated.

To conclude, the model of perceived personalization developed (figure 1), although it represents a noteworthy contribution to personalization research, requires further empirical testing.

The authors have no competing interests to declare.

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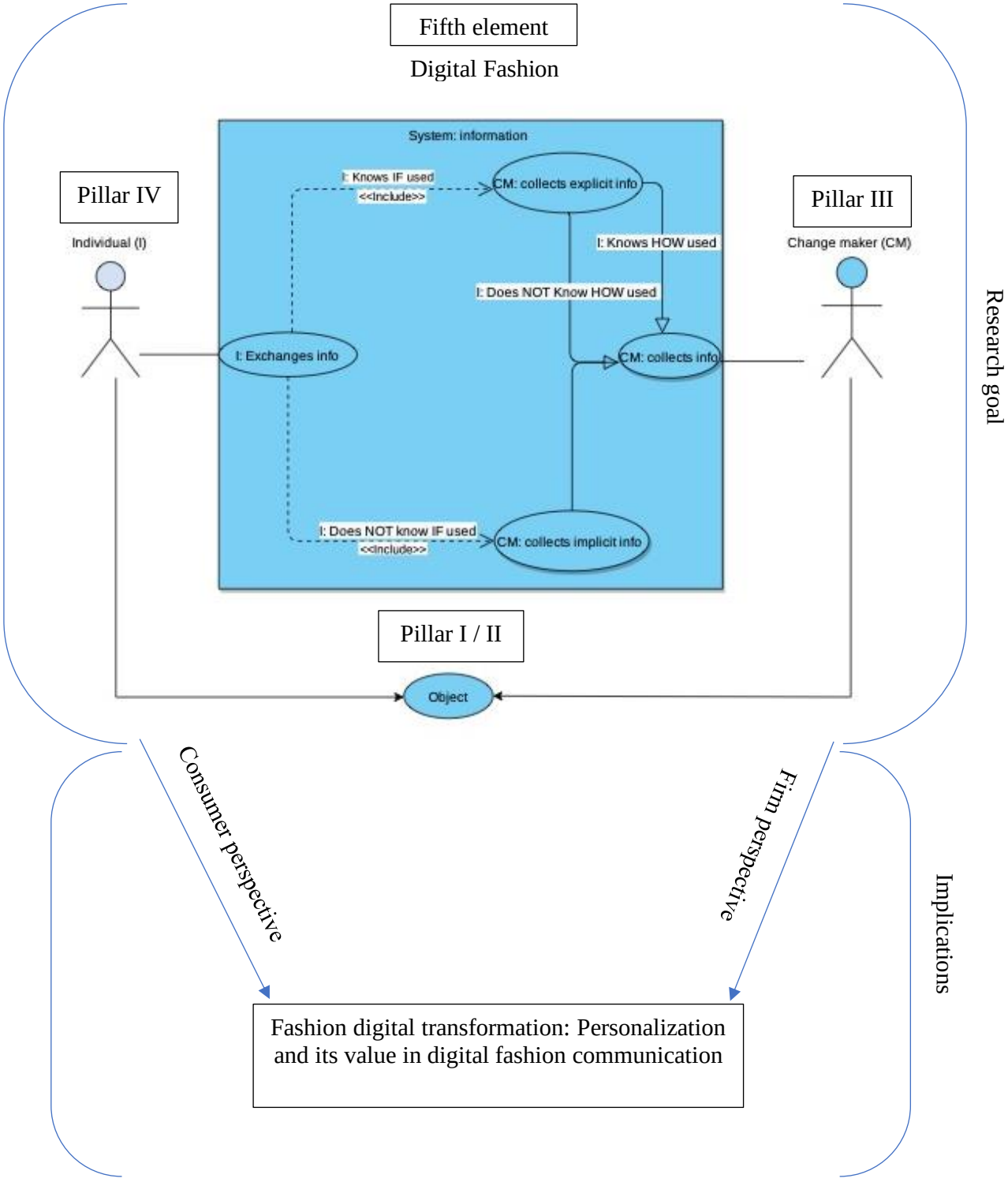
Chapter 6. Conclusions

This thesis was driven by two main factors. Firstly, fashion is experiencing an unprecedented digital disruption, raising interesting questions regarding the overlap of fashion with ICTs. Secondly, in such a digitally transforming fashion sector, personalization has become ubiquitous, bringing questions on its meaning and its value. The thesis addresses such questions through the following overreaching research goal: *"identify how the digital transformation is impacting fashion and creating value through personalization".* Figure 3, by adapting the personalization process illustration developed in study 5 (section 5.2.2), provides an overview of how such goal has been tackled from a consumer and firm perspective by adopting the OCM (Cantoni and Tardini, 2006).

The research contributions are hereafter synthetized by showing how the overall goal is reached. The remaining of this chapter delineates the thesis' managerial implications (section 6.2) and it concludes by addressing its limitations and suggesting directions for future research (section 6.3).

Figure 3. Thesis overview (adapted from Nobile, T.H. & Cantoni, L. (2022) Personalization and Customization in fashion: searching for a definition, Journal of Fashion Marketing and Management)



6.1 Research contributions

By starting from an in-depth analysis of the digitally transforming fashion context (fifth element), this thesis provides an extensive understanding of the ways in which the digital transformation is impacting fashion from both an academic and an industry perspective. From the former perspective, it identifies three main categories with respective subcategories on which the impact is evident: (i) Communication and Marketing (C&M); (ii) Design and Production (D&P); and (iii) Culture and Society (C&S) (sections 5.1.1 and 5.1.2). Mapping the scientific knowledge of a field is extremely important in order to identify its state of the art and guide future research, especially for new areas of research (Lim et al., 2022; Okhuysen and Bonardi, 2011). Thus, the development of such framework represents an important theoretical contribution as, hitherto, no other comprehensive map of digital fashion has been developed.

From the latter perspective, it identifies the skills and competences that are required by workers who wish to work in digital fashion. This represents an important contribution also for the academia, as developing digital fashion curricula in line with the skills needed by the industry is crucial in order to prepare students entering the evolving fashion industry (section 5.1.3).

After having analyzed the digital fashion context, the thesis directs the attention to the Communication and Marketing (C&M) category with a focus on personalization.

Firstly, it contributes to personalization research by reaching a comprehensive definition and showing how it is enacted by fashion firms with a focus on newsletters (Pillars I and II – sections 5.2.1, 5.2.2, and 5.2.3). The definition, by identifying personalization's unique features and attributes, enables to go beyond its "umbrella" understanding and further qualify it. Additionally, by comparing it to adjacent terms and using customization as a discriminator, it enables to distinguish it from related concepts, overcoming important gaps that have been hindering the advancement of personalization research. In fact, having a clear definition is imperative for scientific progress in order to build theoretically sound research (Osigweh, 1989; Suddaby 2010; Podsakoff et al., 2016). Not only does this thesis provide a comprehensive definition from an expert perspective, it also underscores the

importance of capturing its essence from a consumer perspective. Hence, taken together, the studies build a bridge between actual and perceived personalization, providing an unparalleled understanding of personalization in digital fashion. Thus, the thesis's outcomes offer a paramount theoretical contribution by sharpening personalization construct from a dual perspective. This has been achieved by questioning conceptual and theoretical boundaries between different areas of research in order to explain the phenomena with a wider outlook (Okhuysen and Bonardi, 2011).

Subsequently, this thesis shows *if, how, to what extent,* and *under which conditions* personalization provides value to fashion stakeholders.

Both positive and negative effects of personalization are identified. The thesis extends its theorization by explaining such effects as part of consumers' shopping journey and measuring not only *if* but also *the extent* to which different levels of personalization provide value to fashion firms (Pillar III) (section 5.3.1). Additionally, it identifies some of the *conditions* under which personalization provides value to consumers by building on the concepts of mass/interpersonal communication and perception theory (Pillar IV) (section 5.3.2).

Again, adopting a dual perspective – firm and consumer, this thesis adds to the body of literature that studies the value of personalization by identifying a breadth of motivations that shed some light on the controversy regarding its effectiveness. In fact, many communication, marketing, and retailing studies that investigate the topic of personalization adopt the stimulus organism response framework (SOR), as it enables to research a variety of internal / external and tangible / intangible stimuli, several organisms such as consumers' attitudes, emotions, feelings, perceptions, and motivations, and various response factors, such as intention and avoidance (Sultan et al., 2021). While acknowledging the usefulness of the SOR model to study personalization, the OCM (Cantoni and Tardini, 2006) enables to capture its essence and value by approaching it as a two-way communication process in which the people accessing the personalized communications have an important role in the interaction through a dynamic feedback process. The focus is not solely on the behaviour of the message receiver, for example on whether he/she opens a message in response to a personalized stimulus; instead, the

addressee is treated as a critical thinker, who is actively involved in the process. Thus, coupling the two perspectives greatly contributes to capturing personalization as a process that aims to co-create value.

While reaching the overall goal, this thesis also contributes to the four directions by Cantoni et al. (2020) introduced in section 4.1 for advancing fashion communication research.

Firstly, it covers some of the key topics in digital fashion communication and shows how personalization can be utilized to develop digital communication and marketing strategies that create value for fashion stakeholders. Secondly, it promotes interdisciplinarity from both a theoretical perspective by adopting theories from various disciplines (as shown in chapter 3) and also from an empirical one by applying a variety of qualitative and quantitative methods (as presented in chapter 4). The methodological choices for this thesis enable to also address the third point of fostering collaboration between the academia and the industry. An active effort to stimulate and encourage a conversation between academics and practitioners is made by involving fashion industry experts in the development of the definition of personalization (section 5.2.2) and by designing two field experiments (section 5.3.1) in order to conduct research of mutual benefit. Lastly, it contributes to fashion communication through a medium-long-term approach that takes into consideration different stakeholders, such as digital fashion researchers, employees, students, consumers, and managers.

6.2 Managerial implications

Fashion practitioners are looking at how to capitalize on digital advances and create long-term value (BoF & McKinsey & Company, 2022). The thesis offers substantial managerial contributions discussed in each study (see chapter 5). This section wishes to highlight two overall crucial managerial implications.

Firstly, the thesis provides a guide to navigate the challenge of delivering personalization that provides value to both fashion firms and consumers by offering (i) a comprehensive analysis of the elements that contribute to the personalization process and (ii) an updated overview of its critical success factors. These can be useful to not only implement personalization but also reassess extant strategies, their strengths and weaknesses.
Indeed, the old playbook is no longer an obvious solution to benefit from personalization. For example, oversimplifying it to strategies such as "more of the same" can be risky and backfire. Personalization should not be deemed as an always effective strategy. That said, it can provide value, yet to reduce pitfalls, fashion firms should take a step forward and adopt a critical view of personalization and consider contextual elements (as shown in study 5.3.1) and the so-called critical success factors (as presented in study 5.3.2).
Moreover, as repeatedly argued throughout the thesis, listening to consumers through a two-way communication process is essential in order to respond to their needs and preferences and as a result develop personalization that will provide value. In other words, this thesis denounces against developing personalization strategies without a deep customer knowledge.

Secondly, this thesis stresses the "long-term approach" to personalization, meaning that although there are many technologies that put firms in the position to develop highly personalized communications, the costs of personalization should not be undervalued. Just because offering highly personalized communications is feasible, it does not necessarily mean it is always the right thing to do.

To conclude, digital advances coupled with a deep knowledge of consumers can be a powerful combination, yet firms should nurture a critical approach to personalization in order to create value for the stakeholders involved in the process.

6.3 Limitations and future research

The limitations and directions for future research of each study are addressed in the relevant articles (chapter 5). This subchapter presents the overall limitations of this thesis and how they could inspire future research. Three main points are identified and discussed: (i) geographical and cultural context, (ii) personalization types and channels, and (iii) ethical concerns.

Firstly, this thesis is mostly limited to the Western socio-cultural context. Data collection took mainly place and reached individuals and firms in Western countries with few exceptions, such as the explorative study on fashion newsletters (section 5.2.3), which included a minority of Eastern brands.

This did not prevent interesting discussions regarding cultural differences, for example, the field experiments (section 5.3.2) put forward an argument regarding cultural differences between Italian northern and southern regions. However, individuals' values reflect the different social and cultural norms generating various expectations and perceptions (Nam et al., 2021). Thus, inter- and cross-cultural research, which considers culture differences both within and across countries, will be crucial to advance personalization research in digital fashion communication.

A first attempt to collect consumers' perceptions of personalization in Eastern countries was made in South Korea at Yonsei University in order to identify any differences from the data collected in Switzerland. Future research should indeed pursue such research line, which was delayed due the Covid19 pandemic restrictions.

Secondly, the empirical findings are largely constrained to the communication channel of newsletters. Such choice was driven by the firms' wide adoption of newsletters to communicate with customers (Tran and Strutton, 2020; Thomas et al., 2022). Indeed, from

the focus groups, as participants could freely speak about their experiences, insights regarding other channels such as social media, websites, and apps emerged. Nonetheless, due to the technology advances such as AI, which promises the opportunity to create immersive hyper-personalized experiences, future research should extend the focus to different channels. Not only, it should also consider different types of personalization enabled by digital advances. As the digital space becomes increasingly important for fashion (BoF and McKinsey & Company, 2022), the way in which we appear online becomes as important as how we appear offline. Consumers can modify their online appearance through digital filters, enabling them to personalize their digital looks through digital clothes, make-up, jewerelly, and hair-styles (Nobile and Cantoni, 2022). This process of modifying one's digital look could challenge the extant definition of personalization: a consumer to consumer process in which the individual himself personalizes his appearance in order to communicate with other individuals. Other advancements adopted by fashion brands, such as non-fungible tokens, are challenging extant marketing strategies (Hofstetter et al., 2022). Thus, as fashion embraces new technologies, research on various personalization types should be conducted.

Thirdly, although this thesis repeatedly acknowledges that personalization involves ethical considerations, it was beyond the scope of this research to study them in detail.
Since the first industrial revolution, technology, as highlighted in the introduction of this thesis, has always been developed also with the aim of improving human lives (Leonhard, 2016). However, as technologies become more and more embedded in our lives, they are not just technologies and they are not just an aid; instead, they have the ability to shape our lives, they make decisions for us, they decide who we are, whom we engage with, what we purchase, and where we go (Leonhard, 2016; Kruikemeier et al., 2021; Hermann, 2022). Thus, crucial questions regarding self-determination arise, such as: how much control do consumers really have over their shopping experiences and decisions? How much control do we want to give to machines? To what extent shall we let machines determine the information to which we are exposed to?

The rapid digital transformation of fashion should not come at the cost of these crucial ethical questions and the consequences of the technologies should also be considered. The focus should not only be on the feasibility of the digital transformation and its value, instead it should seek to understand at what cost it is being reached. Personalization, in an era when AI and algorithms play an important role in daily interactions and tasks, puts consumers in a vulnerable position, hence it is important to question: when does personalization stop being an opportunity to co-create value and becomes a way to control and manipulate shoppers? The more power is given to technology, the more we should be aware of what is happening by understanding the tension between humans and machines. These represent extremely difficult questions with no easy or straightforward answer. As stated by Leonhard (2016 p. 133) "Technology has no ethics, but human society depends on them". Hence, although legal, their ethicality requires further assessment and should be diligently addressed in future studies (Seele et al., 2021).

To conclude, this thesis highlights that the disruption of fashion is unlocking unprecedented opportunities to create value through personalization. Furthermore, it emerges that the quintessential characteristic of personalization is that of being a dynamic process. Thus, building on the thesis' findings, the intersection of personalization, digital fashion, and digital communication is a promising area of future research.

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