TECHNOLOGIES INTELLIGENTES : LEUR IMPACT SUR LA PRESENCE SOCIALE, L'EXPERIENCE ET L'ENGAGEMENT CLIENT. APPLICATION AU CAS D'UNE CABINE D'ESSAYAGE CONNECTEE.

SMART RETAIL TECHNOLOGIES: THEIR IMPACT ON SOCIAL PRESENCE, CUSTOMER EXPERIENCE, AND ENGAGEMENT. APPLICATION TO A SMART FITTING ROOM.

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Résumé:

Les défis dans la distribution ont entraîné l'adoption de nombreuses nouvelles technologies en magasin pour satisfaire les clients, soulevant des questions sur leur efficacité et leur acceptation auprès de es derniers. Cette étude vise à examiner l'impact des cabines d'essayage intelligentes sur la présence sociale, l'expérience et l'engagement, en reconnaissant l'importance du shopping pour répondre aux besoins sociaux. Nous manipulons le niveau d'interactivité et de personnalisation offert par la cabine. Cet article souhaite comble les lacunes sociales dans la littérature sur le commerce de détail et offre aux praticiens des directives pour une technologie en magasin optimale.

Mots-clés : 5 mots-clés maximum

Technologies intelligentes, distribution, expérience client, présence sociale, engagement client.

Abstract:

Current challenges in the retail industry have forced the spawn of many new in-store technologies to keep customers entertained and satisfied. This raises the question of their efficiency and the consumer's appreciation of such tools. This work plans to investigate how smart fitting rooms affect social presence, experience, and engagement, acknowledging the importance of in-store social interactions and shopping to meet social needs. We do so by manipulating the level of interactivity and personalization the machine offers. This paper addresses overlooked social aspects in the retail literature and provides practitioners with guidelines for optimal in-store technology.

Keywords: 5 mots-clés maximum

Smart retail technologies, customer experience, social presence, customer engagement

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Managerial summary

The study presented in this paper provides several insights for retail managers aiming to implement new technologies in stores. Past research has demonstrated that in-store technologies, alongside various ambient elements, significantly impact the customer experience (Poncin and Ben Mimoun 2014). This study builds upon previous work by focusing on implementing Smart Retail Technologies (SRTs) and emphasizing the social aspects of shopping.

Building on previous research, this study shows that providing an interactive and personalized experience through new technologies effectively meets customers' growing expectations regarding in-store experiences. These innovations bridge the gap between physical and online shopping experiences by offering unique value that cannot be replicated by online shopping.

This paper underscores the importance of the social dimension inherent in shopping. Indeed, stores and store personnel play a key role in the satisfaction of customers' social needs (Smith, Rippé and Dubinsky 2018). With the global shift towards automation and digitalization, managers must recognize that their shops should not only provide a rich experiential environment or facilitate product acquisition but also cater to consumers' social needs. This presents an additional challenge for retailers when designing their customer experience.

Furthermore, this paper is highly relevant for the optimal implementation of smart retail technologies aimed at enhancing the experience while considering the social importance of store personnel. New technologies enable the automation of many tasks traditionally executed by store personnel, which results in a decrease in potential social interactions that can take place in-store. Our experiment offers insights into how to implement smart retail technologies while still providing for customers' social needs and enhancing their overall shopping experience.

1. Introduction

Walmart's CEO recently stated to have "started to invent the future of shopping again" as the company invested in technological development to enhance the customer experience and empower its employees (BusinessWire 2017). With a 14.2% surge in US e-commerce sales from 2020 to 2021 (Hung 2022), organizations must adapt their technological infrastructure. Many retailers are already embracing new technologies to meet rising consumer expectations (Les Echos 2022), due to retail's global digitalization and online shopping's increasing popularity (Shankar et al., 2021). Online retailers offer greater convenience and selection, so consumers now demand more from physical stores (Roozen and Katidis 2019; Deloitte 2022).

Beyond the utilitarian outcomes, consumers now seek experiential benefits from physical shopping trips (Roozen and Katidis 2019). Both business leaders and scholars agree that customer experience is a central component of a firm's competitiveness (Verhoef et al. 2009, McColl-Kennedy et al. 2015, Becker and Jaakkola 2020). Today's consumers expect more than just shopping for acquisition; they seek entertainment in shopping (Foster and McLelland 2015, Roozen and Katidis 2019). Therefore, physical retailers must prioritize exceptional in-store experiences to remain attractive (Spena et al. 2012, Demirkan and Spohrer 2014). A positive customer experience fosters strong connections and engagement with the brand, leading to increased loyalty and advocacy (Mohd-Ramly and Omar 2017, Pansari and Kumar 2017).

Fortunately, retailers have the power to impact customer experience and engagement via a large variety of stimuli, including new technologies (Grewal and Roggeveen, 2020). The digitalization and implementation of smart technologies in the retail environment, referred to as the practice of smart retailing (Pantano and Timmermans 2014, Pantano et al. 2018), has spread widely across different retailers, with tools ranging from self-scanning technologies, which can be found in most supermarket, to service robots. Since most retailers' sales still take place in physical stores (Danziger 2017), the study of in-store technologies has received quite some attention in the literature and keeps being of high interest to scholars (Adapa et al. 2020, Roy et al. 2020, Khan et al. 2021). However, research remains scant when it comes to putting into relation smart retail technologies (SRT), customer experience, and customer engagement (Guha, Grewal et al. 2021, Shankar, Kalyanam et al. 2021).

Within in-store customer experience, SRTs complement or sometimes replace human agents, impacting social interactions. Previous studies have investigated the impact of in-store (human) social interactions on consumers' behaviors or intentions (Kim and Kim 2012, Argo and Dahl 2020). However, despite the growing implementation of new technologies in stores, these studies do not consider the role SRTs might play in these store interactions in the retail environment. We then address some of their limitations by considering the role of SRTs in the social dimension of shopping. Particularly, we want to see how SRTs can evoke a feeling of social presence and thus impact customer experience and engagement. The following sections detail the theoretical background and research questions. As this paper is currently a work in progress, we then present the methodology for our upcoming studies, the expected contribution of this work-in-progress, and the avenues for future research.

2. Theoretical background

Despite SRTs being discussed as potentially enhancing the in-store experience, the analysis of the literature shows how existing studies fall short of identifying how smart retail relates to the crucial outcomes of social presence and customer experience.

2.1. Smart retailing

Smart technologies in the retail environment are referred to as the practice of Smart Retailing (SR) or Smart Retail Technologies (SRT) (Pantano and Timmermans 2014, Pantano al. 2018, Roy et al. 2018, Adapa et al. 2020). Pantano and Timmermans (2014, p.102) define

smart retailing as “a particular idea of retailing, where firms and consumers use technology to re-invent and reinforce their role in the new service economy, by improving the quality of their shopping experience”. SR emphasizes the interactions between customers, products, retailers, touchpoints, and the smart technologies put in place (Roy et al. 2017).

The literature presents various frameworks for categorizing smart retail technologies. They can be customer-facing, impacting the customer journey, or employee-facing, facilitating the retailer’s tasks (Shankar, Kalyanam et al. 2021). They can also be classified depending on which stage of the customer journey they play a role in (pre/post-purchase) (Roggeveen, Grewal and Schweiger 2020). Finally, Grewal and Roggeveen (2020) categorize SRTs based on the level of convenience and social presence that they can offer. All these typologies highlight the fact that one technology can play different roles depending on how it is used by the retailer.

Yet, the impact of SRTs on customer experience and engagement, despite its high importance, has scarcely attracted attention in the literature up to now (Adapa et al. 2020, Roy et al. 2020, Khan et al. 2021). Retailers need to better understand how SRTs impact consumers' experience and how to draw some benefits from their implementation. In particular, since SRTs are a part of the store atmosphere, retailers must remain careful about how these technologies can impact the customer experience while keeping into account their potential to bring a sense of humanness in-store as well (Poncin and Ben Mimoun 2014, Konya-Baumbach, Biller and von Janda 2023).

2.2. Customer experience and engagement

Verhoef et al. (2009, p.32) define customer experience (CX) as a multidimensional and holistic concept. According to them, it includes the cognitive, affective, emotional, social, and physical responses of a customer to the retailer. Customer engagement (CE) is a broad concept that is defined in many ways in the literature. We follow the definition proposed by Hollebeek, Srivastava et al. (2019, p.171) who conceptualize customer engagement as “a customer’s investment of cognitive, emotional, behavioral and social resources during, or related to, specific brand interactions”. Customer experience and engagement are strongly linked but remain two different constructs. Experience is an antecedent of engagement in the sense that an interactive experience is a main determinant of engagement (Bowden 2009, Mohd-Ramly and Omar 2017).

Regarding the role of technologies, as they are a part of the store atmosphere, studies in this area have shown that various elements of the atmosphere are crucial to the creation of the store experience (Poncin and Ben Mimoun 2014, Roggeveen, Grewal and Schweiger 2020). Notably, customer experience and the store atmosphere can also be built upon the social element. For CX, its social dimension refers to the quality of the social interactions that happen in the store. Independently, experiencing the feeling of being in the presence of others, i.e., social presence can impact the CX (Kang and Lee 2018). It is important to note that social presence is a distinct construct from the social dimension of CX. We consider social presence to be an antecedent of CX and wish to explore the role of technology in this relationship (Kang and Lee 2018, Argo and Dahl 2020).

2.3. Social presence theory

Social presence theory explores how technology’s presence influences the feeling of being in the presence of others. The study of social presence in retail mainly focused on two aspects: either physical shopping and human interactions, or human-chatbot interactions (Jiang, et al. 2022, Konya-Baumbach et al. 2023). Past research mainly explored the relationship between anthropomorphic technologies, social presence, and other outcome variables (satisfaction, purchase intention, and experience) (Jiang et al 2019, Moore et al. 2022, Konya-

Baumbach et al. 2023). Studying social presence in a physical retail context is pertinent, especially considering the growing popularity of in-store technologies that can reduce the number of social interactions. Previous research showed that people feeling lonely or socially isolated turned toward store personnel to relieve these feelings (Smith, et al. 2018).

When considering SRTs, some could prompt feelings of social presence. For example, the interactive screen of a smart fitting room, aiming at replacing a shopping assistant (aka a salesperson), might evoke a feeling of social presence among consumers. Indeed, the computer-as-social-actor (CASA) paradigm (Nass and Moon 2000) suggests that humans tend to view computers as social actors; therefore, human-computer interactions could replace human interactions during service delivery without losing much emotional value. According to the CASA theory, even a few social cues (human audio, pictures, videos…) can lead people to view the computer as a social actor rather than just an inanimate tool. Perceived social presence could then awake from elements reproducing some parts of human-to-human interactions, such as interaction with technology or content-based personalization. Thus, there are many potential antecedents to social presence (human pictures, audio, use of human cues…). To understand how SRTs could provoke a sense of social presence, we propose focusing on two antecedents: personalization and interactivity (Hassanein and Head 2007, Kang and Lee 2018, Jiang et al. 2022).

2.3.1. Personalization, interactivity, and vividness

Interactivity is at the heart of smart retailing and store experience (Roy et al. 2017). Initially developed for mediated media such as the web, it refers to users' ability to modify a mediated environment's form and content (Steuer, Biocca and Levy 1995). Not to be confused with vividness, which refers to the richness of the media, including the depth and breadth of information displayed. Vividness can be high (e.g., rich colors, detailed graphics) but non-interactive. While interactivity has been well-studied online (e.g., websites, chatbots), research on in-store technology interactivity and its impacts is limited (Yang and Garnier 2022). Research linking social presence and technology interactivity mostly takes place in the context of information exchange (e.g.: conversational agents) and considers interactivity as the number of responses. In the context of website interactivity, Fortin and Dholakia (2005) showed a direct positive relationship between the website's interactivity and the feeling of social presence. We aim to bring a new light by considering interactivity as the number of actions offered rather than focusing on information.

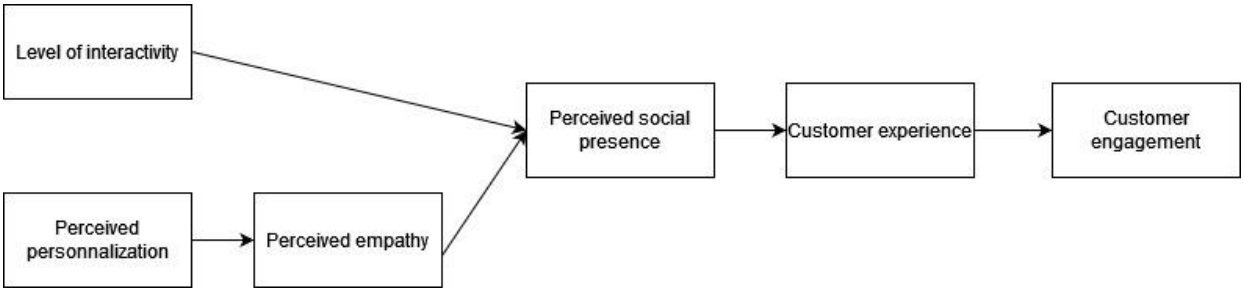
Another possible antecedent to social presence is personalization. Personalization encompasses objective (actual) and subjective (perceived) aspects. Objective personalization occurs when messages are adapted based on the recipient's data, while perceived personalization depends on the recipient's perception of alignment with their preferences. Li (2016, p.26) defines personalization as the delivery of individualized information to recipients based on their preferences. Personalization can also be based on the content and products consumers use; in which case we talk about content-based personalization. This personalization type analyzes the item that the user is browsing and identifies other items with similar characteristics that might be relevant for the consumer (Pazzani and Billsus 2007). This personalization is thus based on the manipulation of the objective (actual) level of personalization and is measured through perceived personalization to better evaluate the impact on the consumer.

The presence of content-based personalization might be perceived as the recognition of one's need, or a sense of empathy (Wieseke et al. 2012). Studies on personalization and empathy have determined that the perceived quality of personalization can have an impact on the empathy felt from the technology (Yoon and Lee 2021), making artificial empathy a mediator in the relationship between personalization and perceived social presence.

Studies indicate that personalization generally benefits the firm's objectives (Li, 2016). Our research innovatively explores how objective personalization and action-based interactivity influence the subjective aspect of customer-perceived social presence, independent of individual factors. Additionally, we explore if perceived personalization can evoke a feeling of empathy from the machine, which would mediate the impact of personalization on social presence.

3. Research question

Following this summary of the literature, our main research question for this study is: to what extent can interacting with a SRT evoke a feeling of social presence through its interactivity and personalization? Hereunder is the research model that guided us through the study design:



4. Methodology

In this paper, we investigate the impact of SRTs on perceived social presence and customer experience. Thus, we focus on a customer-facing technology that can vary in terms of the social presence it can offer. In this logic, we resort to a smart fitting room. The cabin is equipped with a tactile screen that can be set to recognize the products that enter the room thanks to their tag, making it possible to manipulate the level of interactivity (number of commands) and the level of personalization (content-based or absent). This cabin can act in the pre-purchase phase by helping consumers to get more information about products and can thus replace, or at least take off some workload from sales assistants. Its capacity to provide social presence depends on whether it is set to recognize the product being tried on, and thus offer relevant recommendations, and on the number of actions (clicks) it allows.

Our experimental study then explores the impact of interacting with a smart fitting room on the customer experience and its various dimensions, by manipulating perceived social presence (PSP) resulting from consumer interactions with the technology and whether the latter provides personalized recommendations or not.

We plan on conducting an experimental study following a 2x2 between-subject design in a shopping context (4 conditions). We will resort to video-based scenarios as stimuli. To enhance realism, the videos for the 4 conditions will be filmed from a first-person perspective, employing Tobii eye-tracking glasses equipped with a camera to capture the footage from the wearer's point of view. Previous studies have demonstrated that perceptions from live and video-based trials exhibit similarities and potential equivalence in outcomes (Jablonowski 2020). These videos will take place in a store-lab simulating a clothing store for outdoor clothing. Such a lab enables an immersive shopping experience and can effectively substitute for both lab and field experiments (Rivet et al. 2018).

The participants will be exposed to the video of one experimental condition, putting them in the shoes of a shopper looking for a ski jacket. The shopper enters the smart fitting

room equipped with a screen that reacts differently depending on our manipulations. Hereunder is a table summarizing the different manipulations (4 conditions in total):

	Generic personalization: the screen displays the brand's website	**Content-based personalization**: the screen displays the product tried on and recommendations
No interactivity: When touching the screen, nothing happens.	Group 1	Group 2
High interactivity: The customer can fully browse the brand's website.	Group 3	Group 4

5. Sample and measures

An online study is planned in the framework of the paper. With our 4 conditions, we aim at getting 50 participants per condition for the final study and will be resorting to Prolific. To collect the data, we will screen the participants aged between 18 and 75 and native English speakers. All measures are adapted to the context. We will measure customer experience with the scale of Gahler, Klein and Paul (2023), which addresses CX's cognitive, affective, behavioral, relational, sensorial, and symbolic dimensions in 18 items (we ignore the symbolic dimension which we deemed irrelevant to our problematic). We also measure the potential negative experience that consumers might have after using the technology via Williams and Aaker (2002) 3-item scale. For customer engagement, we will use the 9-item scale of Lourenço, Hair Jr et al. (2022). The perceived social presence will be measured with Gefen and Straub (2003)'s 5-item scale. We will measure the level of interactivity with the 15-item scale of Liu (2003) which measures control, two-way communication, and synchronicity. For perceived personalization, we will use the 4-item scale developed by Maslowska, Smit and Van den Putte (2016). We also look at perceived vividness as a control variable using a six bipolar scale from Kelley, Gaidis and Reingen (1989). Finally, we will measure perceived empathy using Pelau, Dabija and Ene (2021)'s scale. All items are measured on a 7-item Likert scale, and the survey includes attention checks and reversed items (see Appendix 1).

6. Expected contributions

Theoretically, this paper aims to contribute to various literature streams by linking the concepts of smart retail technologies, social presence, and customer experience. First, we highlight the importance of the social dimension that needs to be considered while implementing SRTs. Existing work usually studies human-to-human interactions when it comes to looking at social aspects of shopping (Argo, Dahl and Manchanda 2005, Kim and Kim 2012) while we consider this dimension using SRTs. Secondly, research calls for further studies on the role new technologies might play in the store setting (Argo and Dahl 2020, Shankar, Kalyanam et al. 2021). Finally, resorting to experiments would be a contribution to the literature on SRTs since few studies use such methodology in the field (Roggeveen et al. 2016, Van Kerrebroeck et al. 2017, Siegrist et al. 2019, Kang et al. 2020). Studies that do are mostly focusing on virtual or augmented reality technologies or digital displays. Thus, there is room to focus on technologies that have yet to be studied in such light. Regarding managerial contributions, we aim to bring thorough insights on how to successfully implement SRTs while considering the shopping experience.

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8. Appendix

Measures	Items
Social presence adapted from Gefen and Straub (2003)	There is a sense of human contact while using the smart fitting room There is a sense of personalness while using the smart fitting room There is a sense of sociability while using the smart fitting room There is a sense of human warmth while using the smart fitting room There is a sense of human sensitivity while using the smart fitting room
Customer experience adapted from Gahler, Klein and Paul (2023)	**Affective**: The contact with the smart fitting room induced good emotions I had positive feelings during the contact with the smart fitting room The contact with the smart fitting room put me in a good mood **Cognitive:** The contact with the smart fitting room piqued my curiosity I learned something beneficial during the contact with the smart fitting room I got positive insight while using the smart fitting room

	Physical My physical responses during the use of the smart fitting room were pleasant During the use of the smart fitting room, I actively moved in a way I liked During the use of the smart fitting room, I was active in a way I liked **Relational** I established a personal relationship with the smart fitting room I felt positively connected with the smart fitting room The contact with the smart fitting room made me feel like I belonged to a community **Sensorial** The contact with the smart fitting room had a sensory appeal The contact with the smart fitting room had a positive impact on my senses The contact with the smart fitting room positively engaged my senses in a variety of ways
Negative experience adapted from Williams and Aaker (2002)	Using the smart fitting room made me feel uncomfortable Using the smart fitting room made me feel conflicted Using the smart fitting room made me feel confused
Perceived empathy adapted from Pelau, Dabija and Ene (2021)	The smart fitting room is capable of understanding my needs The smart fitting room is capable of understanding my feelings The smart fitting room follows my interests The smart fitting room can adopt my perspective and recommend the desired products The smart fitting room can take care of me The smart fitting room is preoccupied with my wellbeing The smart fitting room is preoccupied with offering me the best products I feel gratitude towards the smart fitting room because of the received products I feel appreciated by the smart fitting room The smart fitting room makes a strong impression on me I feel comfortable depending on the smart fitting room I have positive feelings about the smart fitting room I feel I can have a good connection with the smart fitting room
Personalization adapted from Maslowska, Smit and Van den Putte (2016)	I have the impression that the organization of the proposed products on the screen of the smart fitting room was based on my jacket I have the impression that the choice of products displayed on the screen of the smart fitting room was based on my jacket

	The organization of the content displayed on the screen of the smart fitting room was adapted to my preferred jacket The products highlighted on the screen in the smart fitting room corresponded to my preferred jacket
Customer engagement adapted from Lourenço, Hair Jr et al. (2022)	**Cognitive**: I like to know facts about the Picture brand I often search for more information on the brand I actively look for information related to the brand **Behavioral:** I try to look for new products/services with other Picture's customers I seek to interact with other Picture's customers Looking for new products information with other Picture customers makes me better understand the brand **Emotional:** I like what Picture represents I have good feelings when I look for new Picture products/services I have good feelings when I buy from Picture
Interactivity adapted from Liu (2003)	**Active control** I felt that I had a lot of control over my use of the screen in the smart fitting room While I was browsing the screen, I could freely explore what I wanted to see While browsing the screen, I had absolutely no control over what I can do on it While browsing the screen, my actions decided the kind of experiences I got **Two-way communication** The smart fitting room is effective in gathering feedback The smart fitting room facilitates two-way communication between the customer and the screen It is difficult to offer feedback to the smart fitting room The smart fitting room makes me feel like it wants to listen to its visitors The smart fitting room does not at all encourage visitors to talk back The smart fitting room gives visitors the opportunity to talk back **Synchronicity** The smart fitting room processes my input very quickly Getting information from the smart fitting room is very fast I was able to obtain the information I want without any delay When I clicked on the screen, I felt I was getting instantaneous information

	The smart fitting room was very slow in responding to my requests
Perceived vividness was measured with a six bipolar scale from (Kelley, Gaidis and Reingen 1989)	Imagine you just got involved with the smart fitting room like in the video. Based on that, please evaluate the content you saw on the screen. Not colorful (1) vs Colorful (7) Drab (1) vs Rich (7) Vague (1) vs Graphic (7) Abstract (1) vs Concrete (7) Not descriptive (1) vs Descriptive (7) Low (1) vs High-quality visuals (7)