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Phygital luxury experiences. A correspondence analysis on retail technologies

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Abstract

Beliefs play a prominent role in consumer attitudes toward technology. Hence, the interplay between affective and cognitive perceptions results in approach or avoidance behaviours. This study examines how phygital interactive in-store technologies are perceived in the specific context of luxury retail by providing a holistic picture of the characteristics consumers link to technological applications. Employing correspondence analysis, we highlight the contribution of the affective and cognitive dimensions of beliefs to technology evaluation, both in positive and negative terms. By differentiating between respondents who had already tried the technology and those who had not, the findings reveal how negative bias, derived from a lack of experience, results in negative evaluations; while previous usage of the technology positively impacts technology assessment. The results provide an outline of a valuable customer in-store experience enriched by phygital devices, showing how technology's distinct features attract consumers, and how these perceptions can be leveraged by the retailer to enhance the retail experience.

KEYWORDS
consumer behaviour, correspondence analysis, interactive technologies, luxury retail, phygital

1 | INTRODUCTION

Physical retail, despite its stagnant growth in recent years, has increasingly recovered after the pandemic (Altagamma & Bain, 2023). Nevertheless, to meet evolving consumer expectations and behavioural shifts, luxury brands must design a new role for physical stores that can provide interactive and immersive experiences (Altagamma & Bain, 2023; Chevalier & Gutsatz, 2020).

If the pandemic turmoil has accelerated digitalization and changes in consumption, the shift in retail was already on its way, compelling fashion and luxury players to rethink the store format and its role (The Business of Fashion & McKinsey and Company, 2022). The physical store has prospected to evolve into a '*phygital*' environment (Batat, 2019, p. 71). This hybrid experiential setting matches smart purchasing behaviour and expectations of impatient and zapper consumers, simultaneously connecting the physical and digital worlds (Belghiti et al., 2018).

A change in consumption behaviours represents not only a reflection of the rapid development of technology but also the ongoing change in the luxury world. Recent research has shown increased interest in the role of customers' emotions and experiences, leading to the need to deliver meaningful services (Ko et al., 2019). Therefore, attracting customers with delightful experiences is asserted as one of the main objectives in today's retail environment (Grewal et al., 2009; Verhoef et al., 2009), as well as a pivotal aspect of luxury retail management (Fuentes et al., 2023; Kauppinen-Raisanen et al., 2020).

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The emphasis on creating an immersive and superior customer journey has led retailers to upgrade their stores by introducing technologies into physical settings (Atwal & Williams, 2009; Foroudi et al., 2018; Grewal et al., 2017). Phygital technologies are the engine for Luxury 4.0 (Achille et al., 2018), which lays its foundations in the diffusion of ubiquitous media within luxury retailing, such as smartphones, Artificial Intelligence, 3D printing, Augmented Reality/Virtual Reality (AR/VR) and the Internet of Things.

Although the phygital experiential setting is argued to be a major challenge for luxury companies in the years ahead (Batat, 2019), only a few studies have empirically addressed the effectiveness of technological applications in luxury retail store environments (Lawry, 2021, 2023; Pantano et al., 2018) and investigated shoppers' attitudes towards a phygital shopping experience (Mele et al., 2023). Luxury brands still need to understand what brings value to consumers, to create continuous, coherent and satisfying phygital luxury experiences (Lawry, 2023).

Despite technologies benefit both consumers and brands, retailers considering the implementation of new technologies should pay careful attention to how the latter might affect shoppers' perceptions (Inman & Nikolova, 2017). Although some consumers may find phygital experiences exciting and useful, others may consider them unnecessary technological gimmicks. The important questions to answer are how consumers perceive interactive in-store technologies, what makes them valuable or worthless (Rigby, 2011; Roy et al., 2018) and which role consumer emotions play in the phygital servicescape (Sharma et al., 2023).

According to Bonfanti et al. (2020), the last decade brought the biggest amount of research about the in-store shopping experience. Yet, despite the enormous impact of digital technology, small scholarly research investigated the relevance of its role in consumer experience (Agrawal & Gupta, 2023; Cavalinhos et al., 2021). To the best of our knowledge, only a limited number of studies have explored consumer perceptions of retail technology considering both the affective and cognitive dimensions of belief. According to Lee et al. (2021), AR enhanced tools positively influence consumers' perceptions of utilitarian and hedonic values, as subsequently confirmed by De Amorim et al. (2022). Pantano (2016) empirically investigated the most influential factors that attract consumers to interactive storefronts, whereas Dennis et al. (2010) analysed the impact of digital signage as a retail atmospheric tool and how it influences consumer behaviour.

Thus, while most prior studies have focused on the adoption and acceptance behaviour towards technologies, few have investigated customer resistance to technological innovations (Laukkanen, 2016; Talke & Heidenreich, 2014).

To build the foundation of a successful business strategy, retailers need to understand the drivers of customer acceptance and resistance to technology and leverage specific types of customer value (Roy et al., 2018), specifically in the luxury context, where the shopping experience is more hedonic than in lower-end stores and consumers approach the technology to maximize the efficiency of the transaction (Lee & Leonas, 2020). This study explores how consumers perceive phygital technology in luxury retailing and whether the perception changes if technologies have been previously experienced. Thus, we sought to address the following research questions:

(RQ1) What values are most associated with phygital technologies?

(RQ2) Do high-frequency luxury consumers perceive pyghital technologies differently?

(RQ3) Are there differences in how technology is perceived and evaluated between first-time and repeat customers?

This research adds knowledge in the field of consumer perception and consumer attitude (Paul & Bhukya, 2021) and proposes a novel perspective on technology usage in retail experience by luxury consumers, addressing the call of research of McKee et al. (2023).

This study adopts the explorative technique of Correspondence Analysis, as solicited by Sharma et al. (2023), to discover which emotional, cognitive, positive and negative attributes are associated with each of the eight different interactive in-store technologies examined. Explorative methods are argued to be suitable for understanding the impact of phygital innovations on customer value (Bartoli et al., 2023; Del Vecchio et al., 2023). Correspondence Analysis (CA) is a technique that contributes to marketing research (Hoffman & Franke, 1986). Much of its value relates to its multivariate treatment of data through the simultaneous consideration of multiple categorical variables, which can reveal relationships that would not be detected in a series of pairwise comparisons of variables. This method is employed in the development process or product positioning because it allows the gathering of feedback on a variety of proposed features. For example, a CA using a product feature matrix provides guidelines for appropriate segmentation bases. This method can also be applied in the concept-testing phase when several concepts are competing. An analysis of concepts using an attribute matrix can indicate those concepts that have the most favourable profiles and, consequently, should be developed further.

2 | CONCEPTUAL FRAMEWORK

2.1 | Customer in-store experience in the phygital era

Since Holbrook and Hirschmann (1982) and Pine and Gilmore (1999) theorized that consumption has experiential and hedonic aspects, the creation of a superior customer experience has become a main goal in today's retail environments (Agrawal & Gupta, 2023; Verhoef et al., 2009). Nowadays, the objective is to create emotional bonds with customers by providing pleasurable and interactive experiences that reinforce the offer (Atwal & Williams, 2009; Schmitt & Zarantonello, 2015). Hence, the experience originates from the interactions between a customer and a product, company or part of its organization. Therefore, brands should orchestrate all the clues that people detect in the consumption process (Berry et al., 2006) because they play a crucial role in gaining competitive advantages (Roy et al., 2020).

Experience is the result of a journey involving all touchpoints during the pre-purchase, purchase and post-purchase stages (Lemon &

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Verhoef, 2016). It may involve multiple retail channels and can be influenced by elements that the retailer can control, such as the service interface, store atmosphere, assortment and price (Verhoef et al., 2009). The consumption experience is holistic in nature and involves customers' cognitive, affective, emotional, social and physical responses to the retailer (Honora et al., 2023; Verhoef et al., 2009).

This experience-centric perspective has culminated in today's omnichannel strategy, where different channels and touchpoints are used interchangeably and simultaneously by both customers and firms to facilitate a seamless integrated customer experience (Verhoef et al., 2015). The point of sale appears at the cognitive and emotional apex, where the interaction between the brand and its audience takes place (Alexander & Kent, 2016; Rigby, 2011).

New technologies facilitate both real and virtual interactions (Tynan & McKechnie, 2009). Consequently, the role of physical stores in omnichannel retailing is redefined as part of a larger and more connected experience enabled by technological applications (Alexander & Kent, 2016), and the customer journey is the path a consumer follows using both online and offline touchpoints throughout a purchase process (Fu & Ren, 2023). This results in a shift from points of sale with basic services to technology-based stores, under the principle that a combination of technological, interactive and entertaining touchpoints would attract more consumers (Pantano, 2016; Pantano & Viassone, 2014), minimize in-store shopping hassles and increase positive experiences (Agrawal & Gupta, 2023).

A new set of hybrid consumption experiences is flourishing, which is neither purely physical nor purely digital, but a convergence of characteristics into a phygital holistic ecosystem (Batat, 2019; Castelli, 2016). The concept of phygital has been proposed to depict the '*symbiosis of physical space and virtual space*' (Ballina et al., 2019, p. 658) at the same point of sale (Belghiti et al., 2018), thus the phygital customer journey is characterized by processes by which technological advances dissolve the distinction between reality and virtuality (Mele et al., 2023).

Previous research has revealed that phygital experiences are valuable to customers by providing entertainment and convenience, and by simultaneously enhancing the affective dimension of the in-store shopping experience (Batat, 2019). Phygital interior atmospherics (e.g., self-service technologies, augmented reality and the Internet of Things) can make in-store shopping more seamless and, in some instances, more entertaining (Bèzes, 2019), helping consumer retention (Mishra et al., 2021), as well as employee's experience (Batat & Hammedi, 2023). Moreover, according to Lawry (2021), status-seeking and fashion leader consumers are highly attracted by phygital shopping experiences and phygitality, providing customers with economic, symbolic and social value (Klaus, 2021).

Nevertheless, in the retail sector, the potential of phygital technologies is still far from being fully exploited (Sharma et al., 2023). Despite the benefits emerging from the introduction of technological innovations, a limited number of retailers have adopted them because of the many risks of failure and, above all, the uncertainty of consumer perception and acceptance (Inman & Nikolova, 2017), even though phygital objects, application and context (space or place) are identified to play the role of antecedents, able to affect consumer decisions (Liu et al., 2022; Mele & Russo-Spena, 2022; Sustacha et al., 2022).

2.2 | Theoretical foundations of in-store technology adoption

A substantial stream of research has focused on the adoption of advanced technologies in retailing (Pantano et al., 2018) and on consumers' and employees' acceptance and usage of technology (Venkatesh & Davis, 2000). However, starting with the technology acceptance model (Davis, 1989) and its extensions (Gross, 2015; Yang et al., 2015), most studies stressed consumer acceptance of technological innovations in retail settings as a consequence of perceived ease of use and usefulness (Pantano, 2016). These theories have been successful in predicting consumer motivation, behavioural intentions and technology adoption (Shahab et al., 2021). However, the excessive emphasis on the utilitarian benefits of the aforementioned models highlights the need to integrate the affective dimension of beliefs (Adapa et al., 2020) and hedonic elements of information systems (Hu et al., 2023), considering technology as a recreational tool for improving the shopping experience (Pantano & Viassone, 2014).

Different types of customer responses arise at the intersection of the digital, physical and social realms (Bolton et al., 2018), increasing the complexity that providers must manage (Varnali, 2018). In such evolving contexts, the experience a customer enjoys is depicted as a multidimensional construct that includes affective, cognitive, sensory, social, symbolic and temporal dimensions (Lemon & Verhoef, 2016). Cognitive reactions relate to the utilitarian evaluation of shopping and their capabilities to use new technologies. Conversely, the affective state refers to emotions or feelings that the customer experiences, such as fun, pleasure and enjoyment (Grewal & Roggeveen, 2020), which have been proven to play a significant role in driving consumers' acceptance of retail technologies (Kulviwat et al., 2007), and could be even stronger predictors than extrinsic motivators such as perceived usefulness (Pizzi & Scarpi, 2020).

Perceptions, attitudes and reactions to technology are covered by research on emotions, which has evolved from many different disciplines. According to the environmental psychology paradigm, technology enhances the retail atmosphere and plays a role in customers' approach or avoidance behaviours (Dennis et al., 2012; Pantano, 2016).

Offline consumers are easily affected by the shopping environment, and engaging and interactive technology can influence their mood before entering the point-of-purchase stage, either in terms of favourable or unfavourable attitudes, affecting the propensity to approach or avoid new technology (Roy et al., 2018). Inasmuch as people make evaluative judgments based on their mood (Mattila & Wirtz, 2000) and tend to make mood-congruent evaluations (Gardner, 1985), it is pivotal to categorize consumers' emotions in the early stages of the customer journey, to anticipate the effects of positive or negative consumer moods on target activities. For instance, feelings of joy, happiness, and contentment positively affect perception (Kim

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et al., 2016). Emotions make sensory inputs seem pleasant (Sharma et al., 2023), making people more patient, tolerant and generous (Izard, 1977). However, when they feel sad, people become more impatient (Mischel et al., 1972) and egoistic (Moore et al., 1973).

2.3 | Technology as an atmospheric element

Since Kotler (1973) introduced the term 'atmospheric', extensive efforts have been made to investigate the effect of ambient elements on consumers' perceived store image (Baker et al., 1994; Hu & Jasper, 2006), satisfaction (Sulek & Hensley, 2004), purchase behaviour (Chebat & Michon, 2003; Mattila & Wirtz, 2000) and post-purchase behavioural intentions (Ryu & Jang, 2007). The retail environment has been found to influence both shoppers and personnel's behaviours (Milliman, 1986; Stanley & Sewall, 1976).

Marketing scholars have studied the effects of store clutter and cleanliness on consumer behaviour (Bitner, 1990; Garder & Siomkos, 1985), as well as the effect of music (Morin et al., 2007), colours (Bellizzi et al., 1983), lighting (Golden & Zimmerman, 1986), crowding (Eroglu et al., 2005), ambient scent (Baker et al., 1994; Bitner, 1992) and ambient temperature (Griffitt, 1970). Other researchers have proposed that store design (Baker, 1987), staff behaviour (Mattila & Enz, 2002) and customer-oriented technological devices are part of the retail atmospheric elements (Dennis et al., 2010; Klaus, 2021; Lecointre-Erickson et al., 2021; Pantano, 2016; Poncin & Mimoun, 2014).

Most studies on retail atmospherics follow the framework of Mehrabian and Russell (1974). The authors suggested that atmospheric stimuli influence behaviour through emotional alteration, which predicts the response towards the environment and results in two contrasting forms of behaviour: approach and avoidance.

Despite the significant contributions of this framework, several limitations have been recognized when it is employed to measure consumption-related emotions (Richins, 1997). An affective view provides only a partial explanation of the relationship between atmospherics and consumer behaviour. Therefore, it has been argued to consider also the cognitive processes elicited by the environment (Liu & Jang, 2009). Moreover, Mehrabian and Russell's bipolar scale of emotions reveals unsuitable for capturing consumer perceptions because feeling a negative emotion does not preclude the simultaneous occurrence of positive emotions (Babin et al., 1998).

In the specific case of technologies applied to retail, Batat (2019) claimed that a phygital luxury experience should provide a cognitive and affective response. Researchers argued that technology attributes and interactive properties of technology can explain consumers' cognitive and affective experiences and subsequent technology adoption (Kolesova and Singh (2019); Lee et al., 2021; Zhao et al., 2020). For example, Pantano (2016) demonstrated how emotional aspects emerge as the most influential factors in the case of traditional storefronts, while both emotional and functional aspects emerge as the most influential factors when considering the integration of interactive technologies. Massa and Ladhari (2023) analysed how AR experience generates cognitive and affective responses that lead consumers to stay longer at a store.

The debate over the interplay between affect and cognition has culminated in different approaches (Bigné et al., 2008; Chebat & Michon, 2003). In this study, we follow Petty and Cacioppo's (1986) elaboration likelihood perspective, according to which '*evaluations can be based on a variety of behavioral, affective, and cognitive experiences, and are capable of influencing or guiding behavioral, affective, and cognitive processes* (p. 127). They suggest that both affective and cognitively elicited beliefs influence consumers' judgments simultaneously, as reported in subsequent studies (Das, 2014; Levy & Weitz, 2001; Mano & Oliver, 1993; Oliver, 1993; Shahab et al., 2021; Turley & Milliman, 2000). Additionally, and specific to the hedonic context, psychological concepts with opposing valences coexist in people's experiences (Otnes et al., 1997). In luxury retail settings, cognitive and affective elements play a central role in consumer outcomes (Prestini & Sebastiani, 2021).

In this research, the term consumption is used broadly to include anticipatory consumption (Richins, 1997). We assessed which technology-elicited beliefs triggered customers before entering a shop, a step of the journey under-investigated in past research; it was mostly the emotions that customers felt in the store that received scholarly attention, leaving perceptions before entering a store under-researched and ignoring the importance of differentiating customer beliefs in all the touchpoints of the customer journey (Kim et al., 2016). At the pre-experience stage, customers anticipate and prepare for consumption by imagining what the experience might be (Arnould et al., 2004). It is crucial to assess multiple sources of customer value throughout the whole experience (Tynan & McKechnie, 2009).

3 | MATERIALS AND METHODS

This study's data came from a web-based anonymous survey among Italian consumers conducted between December 2020 and March 2021 using snowball sampling, a technique considered useful in exploratory research and considered an '*informal and chain-referral*' method to reach a young population (Atkinson & Flint, 2001, p. 101). A pilot test was conducted in November 2020 and several modifications were made based on the feedback that resulted in the final questionnaire. The survey administration software employed (Google Forms) allowed the editor to prevent common method bias and randomly submit answers using procedural methods (Podsakoff et al., 2003). All questions were mandatory; alternatively, the respondents had the chance to quit the form. Overall, the study gathered 1427 responses, equally represented by sex, with an average age of 31.7 years.

The questionnaire presents nine sections. The first section contains five socio-demographic questions. Respondents were asked to indicate their gender, age, nationality, education level, and frequency of luxury purchases on a four-point Likert scale ranging from 1 (never) to 4 (every month). Table 1 describes the study samples.

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TABLE 1 Socio-demographic characteristics of the study sample (%).

Variable	Description
Gender	48% men; 52% women
Age	2% <18; 39% = 19–25; 33% = 26–40; 26% >41 years old
Nationality	96.9% Italians; 3.1% other countries
Education	3.9% middle school diploma; 29.5% high school diploma; 57.4% degree; 9.2% PhD or Master
Frequency of purchase of luxury goods	27.1% never; 50.3% occasionally; 18.0% every 2 or 3 months; 4.7% every month

The following eight sections correspond to each of the technologies analysed: self-checkout, interactive storefront, touchscreen display, hololens, smart fitting room, holograms, facial recognition and neuroscience stylist.

We selected eight shopper-oriented interactive technologies at different stages of implementation in retail (Del Vecchio et al., 2023), which allow direct interaction with the customer, rather than back-end applications such as RFID or beacons (Renko & Druzijanic, 2014).

Respondents were provided with a short description and a picture of every technology that showed past technology implementations in fashion and luxury stores (examples of the pictures proposed are provided in the Supporting Information Appendix). They were asked to flag whether the 16 emotional, functional, positive and negative descriptors reflected their perception (e.g., '*How would you describe the interactive storefront*'?); multiple items could be selected. Subsequently, for every technological application proposed, we asked two specific questions to assess whether respondents had ever tried the technology (e.g., '*Have you ever tried the interactive storefront*'?) and willingness to try it for the first time or again (e.g., '*Would you like to try—or try again—the interactive storefront*'?).

A list of functional and emotional items was proposed to describe the characteristics that the respondents associated with each technology. The list is presented in Table 2.

Although there is no overarching consensus on basic human emotions, it is generally accepted that emotions can be categorized as positive and negative. Thus, eight emotional descriptors were selected from those most frequently cited in the consumption emotion literature (Mehrabian & Russell, 1974; Richins, 1997). The items selected were pleasant, exciting and amazing as positive emotions and annoying, alienating, worrisome, creepy and supervized as negative emotions. Additionally, two VIP emotions were adopted: privileged and sophisticated. These emotions have been employed to measure customer emotions in luxury retail settings (Kim et al., 2016).

Six of the cognitive measurements of Crites et al. (1994), Davis (1989) and Lee and Leonas (2020) were selected and adapted. The semantic pairs for the cognitive measures included useful and useless, easy to use and uneasy to use, and speed and slow. To avoid context bias, the order of the positive and negative items was randomized (Wainer & Kiely, 1987).

TABLE 2 Sources for the items selected.

Items categorization	Items	Sources
Positive	Pleasant	Richins (1997)
	Exciting	Richins (1997)
	Amazing	Richins (1997)
	Useful	Crites et al. (1994), Davis (1989)
	Easy to use	Crites et al. (1994), Davis (1989)
	Speed	Lee and Leonas (2020)
	Privileged	Barsky and Nash (2002)
	Sophisticated	Barsky and Nash (2002)
Negative	Annoying	Mehrabian and Russell (1974)
	Alienating	Richins (1997)
	Worrisome	Richins (1997)
	Creepy	Richins (1997)
	Supervised	Mehrabian and Russell (1974)
	Useless	Crites et al. (1994), Davis (1989)
	Uneasy to use	Crites et al. (1994), Davis (1989)
	Slow	Lee and Leonas (2020)

4 | RESULTS

Correspondence analysis was employed to uncover the relationships between two or more multilevel categorical variables and to geometrically portray the row and column points of the data matrix in a low-dimensional space to facilitate visual interpretation (Hair et al., 2010). It also allows for the identification of clusters with similar distributional characteristics, as well as to graphically depict row–column associations, based on row–column proximity in factor space (Beh & Lombardo, 2015).

First, to explore the attributes that consumers associate with each of the examined in-store interactive technologies, we constructed a contingency table that displays the frequency distribution of the variables. The presence of an overall association between the attributes and the phygital techniques of interest was tested using the chi-square test.

The two-way contingency table (Table 3) reflects the frequency of usage as a percentage received by a particular feature (rows) for every technology (columns), as selected by our sample of 1427.

Visual inspection of the contingency table indicated that pleasant, useful and speed were the dominant attributes associated with most of the technologies analysed. Privileged, uneasy to use, alienating, slow and creepy had a small association with all the technologies. Neuroscience stylist, hololens and smart fitting room used several attributes widely, whereas interactive storefront, touchscreen display, self-checkout and hologram appeared to have some polarizing attributes. For example, interactive storefront was mostly considered pleasant (23%), and self-checkout was useful (29%).

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TABLE 3 Contingency table: Cross-classification of individuals according to technologies and the 16 features, expressed in %.

		Interactive storefront	Touchscreen display	Hololens	Self-checkout	Facial recognition	Neuroscience stylist	Holograms	Smart fitting room
Positive	Pleasant	23%	16%	25%	5%	7%	14%	25%	16%
	Exciting	5%	2%	13%	2%	2%	9%	12%	7%
	Amazing	3%	2%	9%	2%	4%	8%	13%	6%
	Useful	15%	23%	9%	29%	23%	13%	11%	22%
	Easy to use	11%	21%	2%	18%	14%	3%	2%	1%
	Speed	10%	15%	3%	24%	15%	4%	3%	11%
	Privileged	2%	2%	5%	1%	2%	4%	4%	4%
	Sophisticated	8%	5%	9%	4%	8%	10%	11%	8%
Negative	Annoying	3%	1%	3%	3%	5%	3%	2%	2%
	Alienating	2%	2%	3%	2%	1%	2%	1%	2%
	Worrisome	2%	1%	2%	1%	9%	7%	2%	1%
	Creepy	1%	0%	6%	0%	6%	5%	2%	8%
	Supervized	8%	4%	3%	1%	1%	8%	2%	6%
	Useless	5%	3%	5%	2%	3%	5%	5%	4%
	Uneasy to use	1%	1%	2%	2%	1%	3%	3%	1%
	Slow	3%	2%	1%	3%	1%	1%	1%	2%
	TOT	100%	100%	100%	100%	100%	100%	100%	100%

Source: Authors' elaboration.

Overall, the contingency table shows that respondents selected positive items more often than negative ones.

A chi-square test of 7681 (p-value < .0001), indicating the presence of an overall association between the attributes and the phygital technologies, revealed that the choice of the respondents to flag attributes was non-random but dependent on the technique.

We then carried out a CA using the software R, with the Library (Factoextra) and Library (FactMineR). To determine the dimensionality of the solution, we examined the eigenvalues and cumulative proportion of the variance explained by each dimension. The first and second dimensions accounted for 64.4% and 16.9% of the inertia, respectively; thus, the two-dimensional solution will explain 82.3% of the inertia. A threshold of 80% was considered appropriate for solution retention (Bendixen, 1996).

Figure 1 illustrates the graphical output in two dimensions generated by the CA when processing the data matrix (Table 3).

The perceptual map reveals the relationships between the attributes (row labels) and technologies (column labels). The origins of the axes correspond to the average profiles of the two variables, whereas the x- and y-axes correspond to the first two factors (Principal Axis 1 = 64.4%, Principal Axis 2 = 16.9%). In the first quadrant (right upper corner), the smart fitting room and the neuroscience stylist are located in proximity to the sophisticated and privileged. Although these two technologies are associated with the two VIP emotions, they are also linked to the negative trait uneasy to use. Creepy and worrisome are isolated and appear to be slightly associated with closer technologies. Specifically, creepy represents an outlier rarely associated with technological applications.

In the second quadrant (right lower corner), the strongest association exists between the terms hololens and hologram and exciting and amazing. These two technologies are perceived as the most engaging; however, even if they are linked to positive emotions, they have also been associated with the term useless.

At the bottom of the third quadrant (left lower corner), the touchscreen display is close to easy to use but also slow, indicating that it is perceived as user-friendly; however, it also slows down the customer journey. The interactive storefront is considered slow and gives consumers a sense of alienation and supervision, even if they are linked to pleasant. Self-checkout is located near the middle, between the third and fourth quadrants, and is characterized by cognitive traits such as speed, useful and easy to use.

In the fourth quadrant (left upper corner), facial recognition is placed far from any other technology. It is most frequently associated with annoying and slightly less with worrisome and negative emotions, but also with useful and speed, indicating that the consumer recognizes its utility despite perceived intrusiveness.

From a broader perspective, it is apparent that the left side of the perceptual map is characterized by a higher presence of functional traits. Thus, the technologies located on the left are mainly associated with cognitive features. Affective traits are predominant in the right-side quadrants, indicating that the interactive technologies located here stimulate more emotional responses in the consumer's mind.

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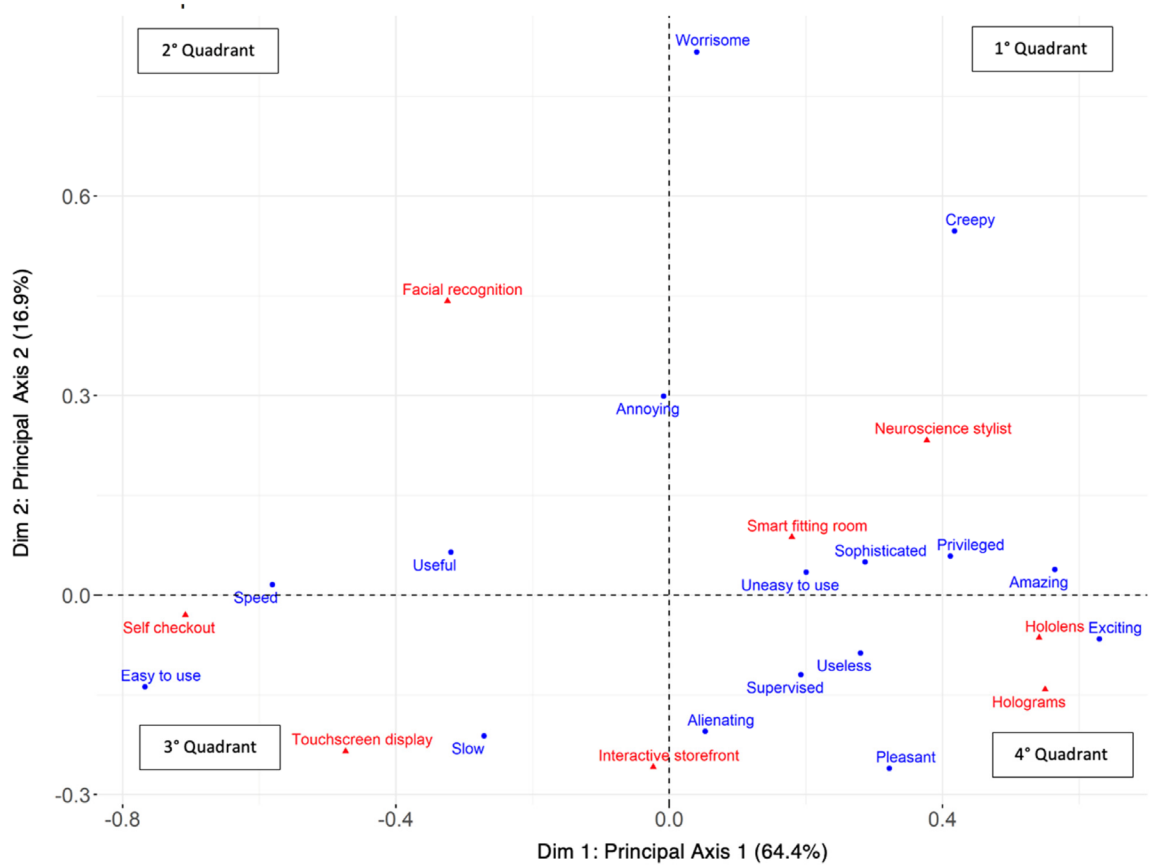

FIGURE 1 Perceptual map. *Source*: Authors' elaboration.

Thus, one may say that most of the technologies analysed here can be divided into two categories based on consumer perceptions: functional and hedonic.

When applying CA, only to respondents who self-declared as luxury consumers (frequency of luxury purchases equal to or more than every 2–3 months), all technologies were located in identical quadrants (Figure 2), except for self-checkout, which was placed on the horizontal axis that divided the third and fourth quadrants.

The items appear more polarized than in the previous map, indicating that the associations between attributes and technologies are clearer. For example, in the first quadrant (right upper corner), uneasy to use, sophisticated, privileged and amazing are located closer to the smart fitting room and neuroscience stylist. The emotion term annoying moved from the fourth to the first quadrant. The second and third quadrants remained unaltered. The fourth quadrant (left upper corner) is populated mainly by positive and functional attributes, indicating that luxury consumers perceive facial recognition as a useful and speed technology.

Furthermore, for every technological application, we asked our sample whether they had already tried the technology and their willingness to try it. Table 4 presents the results of the study.

Overall, three out of four respondents declared that they wanted to try these technologies. The least requested was a neuroscience stylist (64.7%), whereas the most requested were display touchscreens (81.0%), self-checkouts (81.1%) and smart fitting rooms (79.5%). The most tried technologies were those that could easily be found in stores and mass-market retail, namely display touchscreens and self-checkouts. Facial recognition had reached a large number of people who had already tried it, perhaps because it is a technology implemented on personal devices. Neuroscience stylists and smart fitting rooms are rarely implemented in retail, and the number of people who had already tried them reflected this fact.

Looking at the attractiveness of the technologies, expressed by those who had never tried them, resulted in a lower request compared to the percentage of respondents who had already tried the technology. Thus, one might say that the perceived attractiveness is lower than the enjoyment derived from actual usage. This is particularly true for self-checkout, facial recognition and neuroscience stylist. We can also add that once a technology has been tested, the willingness to try it again is overall higher for all technological applications.

Finally, based on the segmentation derived from the first question ('*Have you ever tried the technology*?'), for every technology, we compared how positive and negative attributes were associated in relation to previous usage. Table 5 presents the results.

For all the technologies observed, the number of respondents that associated at least one positive attribute was significantly high for all the samples; however, it increased for those who tried the technology compared to those who did not. For example, among the 1161

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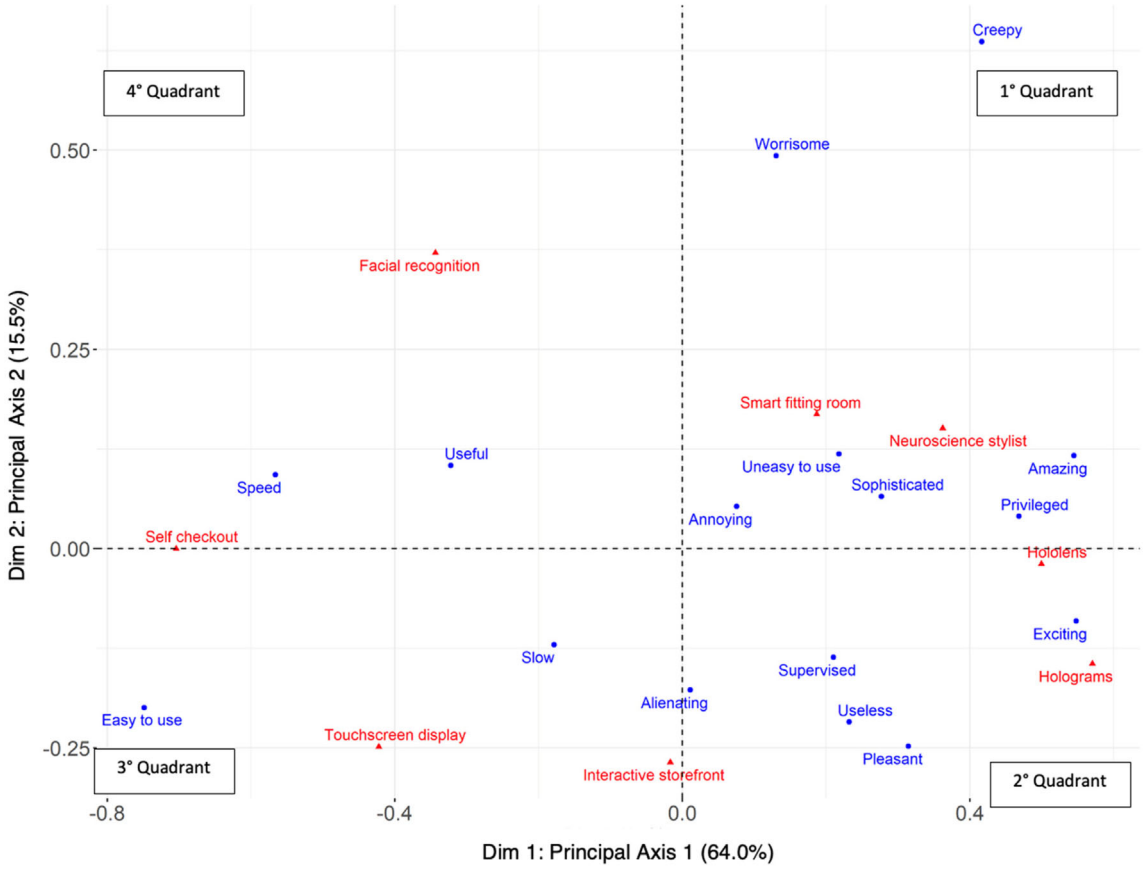

FIGURE 2 Perceptual map of the luxury consumer. *Source*: Authors' elaboration.

TABLE 4 Number of respondents who tried or never tried the technology before, and number of respondents who want to try it again.

In-store technology	Never tried	Already tried	Total request	Attractiveness	Enjoyment
	n	*n*	% of respondents who want to try the technology (on the total sample)	% of respondents who never tried the technology before and want to try it for the first time	% of respondents who already tried the technology before and want to try it again
Interactive storefront	1161	265	74.4	73.1	80.0
Display touchscreen	436	990	81.0	74.3	83.9
Hololens	1173	253	78.4	76.7	86.2
Self-checkout	473	953	81.1	67.4	87.8
Facial recognition	651	775	69.6	51.6	84.7
Neuroscience stylist	1407	19	64.7	64.5	73.7
Hologram	1211	215	76.4	74.9	84.7
Smart fitting room	1372	54	79.5	79.2	85.2
MEAN			75.6	70.2	83.3

subjects who never tried interactive storefronts, 74.0% were associated with at least one positive attribute, whereas among the 265 who had already tried it, the percentage was 86.8%. The greatest increase was achieved through facial recognition and self-checkout. Despite the increase in positive associations, neuroscience stylists and smart fitting rooms were not statistically significant.

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TABLE 5 Comparison between the percentage of at least one positive or negative attribute assigned by the group (those who tried or not tried the technology) for single technology.

	Sample size		% at least one positive attribute			% at least one negative attribute		
	Have you ever tried?		Have you ever tried?			Have you ever tried?		
	No	Yes	No	Yes	*p*-value	No	Yes	*p*-value
Interactive storefront	1161	265	74.0	86.8	.000	43.9	34.7	.006
Display touchscreen	436	990	77.3	91.3	.000	35.2	22.0	.000
Hololens	1173	253	73.6	86.2	.000	33.1	30.8	.489
Self-checkout	473	953	71.0	90.4	.000	33.0	17.5	.000
Facial recognition	651	775	50.1	87.7	.000	57.8	27.4	.000
Neuroscience stylist	1407	19	57.2	63.2	.603	48.5	52.6	.721
Hologram	1211	215	74.3	91.2	.000	28.4	15.8	.000
Smart fitting room	1372	54	77.4	83.3	.305	34.3	37.0	.676

Note: Chi-square Test.
Source: Authors' elaboration.

The results show that the positive associations increase with experience—those who tried the technology—have a more positive opinion than those who did not. When looking at negative associations, the number of respondents who gave at least one negative attribute was significantly lower among those who had already tried the technology than among those who had not. Overall, negative beliefs decreased with increased usage. This is particularly true for facial recognition, where more than half of the respondents who had never tried it before (57.8%) stated at least one negative attribute, but the number halved among those who had already tried it (27.4%). The exceptions were the smart fitting room and the neuroscience stylist, where the number of negative associations increased with usage, but the results were not statistically significant.

5 | DISCUSSION

5.1 | Implications for theory

Luxury retail is experiencing a transformation. Centrifugal forces are moving customers away from physical stores to other channels, affecting retail productivity and sales dilution. The shopping experience is no longer exclusive to physical spaces, a change that requires brands to give consumers more reason to spend time inside stores by creating a superior customer journey (Cavalinhos et al., 2021). Interactive technologies offer the possibility to engage clients, provide memorable shopping journeys and deliver a seamless omnichannel experience.

Concerning RQ1, the results show how consumers perceive phygital technological applications implemented in luxury stores. While some technologies are considered beneficial from a functional viewpoint, others are approached from an emotional perspective.

Well-established technologies are primarily considered functional. Self-checkout and touchscreen display attract consumers for the benefit they receive in terms of making the shopping journey faster and easier. This is probably because these technologies are more diffused in shopping malls or lower-end stores, where the goal of the shopping trip is less hedonic than in luxury retail. These findings are in line with past studies showing how self-checkouts are perceived as fast and are employed by clients to maximize shopping efficiency (Lee & Leonas, 2020).

However, when considering more disruptive and unusual technologies, emotional and hedonic components prevail, as also assessed by De Amorim et al. (2022) analysing hololens glasses. Interactive storefronts, hololens, holograms, smart fitting rooms and facial recognition were perceived as engaging, amazing and pleasant. Simultaneously, most of them are considered negatively from both the cognitive and emotional viewpoints as: alienating, uneasy to use, useless and make the consumer feel supervized.

These findings highlight how some technologies are perceived through a combination of different cognitive and emotional features, whereas others are mainly linked to utilitarian benefits. However, if we get closer to the portrait displayed by the perceptual map, we can observe that for a technology that prevails with positive cognitive features, the emotional features are negative or absent. An example is the touchscreen display, a technology purely associated with functional traits. In contrast, when technology is characterized by hedonic traits, the downside is the loss in terms of functional benefits, as all technologies located on the right side of the perceptual map demonstrate.

In an attempt to answer RQ2, we repeat the CA only on a subsample of luxury consumers. All attributes were located in identical quadrants except for facial recognition. This technology is perceived by luxury customers to be more positively functional than by the whole sample and is closely related to the cognitive attributes useful and speed. We can deduce that this high-spending consumer sample is probably more familiar with facial recognition.

Beyond determining what technology can potentially deliver in terms of functional benefits, practitioners should consider shopper reactions from an emotional perspective and assess what technology

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will deliver as a whole. For example, past analysis reveals how negative emotions elicited by consumer-brand relationships can potentially result in negative consequences (Khatoon & Rehman, 2021).

According to environmental psychologists, perceptions influence approach or avoidance behaviour and ultimately impact the overall consumer experience (Turley & Milliman, 2000). Consequently, based on our findings, one may deduce that facial recognition and neuroscience stylist, being associated with negative emotions (creepy, worrisome and annoying), should inhibit consumers from approaching these technologies, resulting in a less engaging in-store experience. Functionality is not always more important than hedonic features. Rather, hedonic ones may assume a greater weight in consumers' minds and help create a stronger emotional connection, which in turn may reduce customers' price sensitivity and enhance their shopping experiences. Additionally, hedonic escapism can facilitate luxury experiences (Holmqvist et al., 2020) and allow luxury brands to gain favourable evaluations and extend their brand more easily (Hagtvedt & Patrick, 2009), thus the stimulation of positive emotions with phygital technologies should be prioritized. Rather than focusing on cognitive features, luxury retailers can elicit hedonic appeal by engaging in pleasurable technologies. Brands can also leverage their social status through technologies associated with VIP emotions. Smart fitting rooms are closely related to the term sophisticated, neuroscience stylist and hololens and make consumers feel privileged. Such emotions are highly evaluated by status-seeking and fashion-leader consumers, which results in the improved attractiveness of phygital shopping experiences (Lawry, 2021).

Finally, about RQ3, our evidence highlights the differences in how a technology is perceived between customers who have never tried it and those with past experience. Respondents presented negative biases towards some technologies if never tried, probably owing to a lack of experience. However, while negative beliefs decrease if a technology is tried, positive beliefs increase, which is consistent with the willingness to try it again. Moreover, the enjoyment derived from usage is higher than the technology's attractiveness because the number of people who want to engage with the technology again is greater than the number of first-time clients. This evidence suggests that investment in in-store technologies is compensated, over time, through satisfaction, but consumers need to experiment with new technologies to appreciate them.

This study adds to the body of knowledge on customer experience and experiential marketing in the following aspects.

First, although the number of phygital retail applications is increasing, it is still unclear which factors may influence customer experiences (Sharma et al., 2023), especially hedonic factors (Banik & Gao, 2023). The study provides a clear picture of the hedonic and utilitarian elements that drive consumer acceptance of or resistance to technology.

Second, it is explored the impact of the phygital customer experience on patronage decisions. By doing so, we addressed the proposal of Klaus (2021, p. 12), who suggested assessing whether there are differences between how a phygital customer experience is perceived and evaluated between first-time, repeat, and regular customers.

Third, this study extends the current body of knowledge by embracing a research methodology with projective techniques, as argued by Batat (2023) and Sharma et al. (2023), which can provide more flexibility and adaptability when studying consumer behaviours occurring in hybrid settings, such as phygitals. The relevance of projective techniques, which are essentially based on projection rather than actual reality, comes from their aptitude to help participants share ideas and feedback while distancing themselves (Batat, 2022). By creating imaginary situations in which the participants project their feelings, the researcher can obtain a response from the participant without asking a direct question.

Finally, it embraces the call for novel research (Shahab et al., 2021) to study new technologies with Petty and Cacioppo perspective (1996) in analysing consumer behaviour.

5.2 | Implications for managers and consumers

Past research demonstrated that the more touchpoints customers use in their journey, the greater the positive impact on purchase behaviour (Fu & Ren, 2023). In this sense, the study provides insights to industry managers by indicating how customers' journeys can be enriched in phygital retailing. To design effective phygital luxury experiences, practitioners need to consider how the perception of phygital devices affects customers' approach or avoidance behaviour. According to this study's results, the hedonic or utilitarian content of in-store technology affects consumers' perceptions of the technology differently. Selecting the most appropriate technological implementations according to the goal they wish to pursue is pivotal to engage and retain customers.

Based on our analysis, two scenarios for luxury companies arise.

- To maximize the efficiency of the shopping journey, predominantly utilitarian technologies such as self-checkouts, touchscreen displays and facial recognition are used, but there is a loss of entertainment.
- The preference for recreational experience involves neuroscience stylists, hololens, holograms, interactive storefronts and smart fitting rooms, with a decline in utilitarian benefits.

The key success factor depends upon the value a brand prefers to deliver, since the maximization of efficiency involves a lack of emotional benefits, whereas escapism lacks functionality. For example, results show that some technologies contain a strong utilitarian component that enables customers to improve efficiency, rather than enhancing the shopping experience through hedonic added value. Considering the specificity of the luxury context, where hedonic experiences are preferred by clients and emotions are evaluated more in the decision-making process, it is argued to favour recreational technologies and try to counterbalance the entertaining benefits with functional ones.

Moreover, even if our results show that the overall perception of technologies increases positively with their use, some technologies

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might attract consumers with engaging features. However, once tried, they turn out to be useless or difficult to use. It turns out to be pivotal for managers to assess which perceptions prevent or attract users to try the technology and which kind of benefit it delivers after the experience.

5.3 | Limitations and directions for future research

Our results should be read with consideration of these limitations. Since the data were collected from a single source, sample selection bias could have affected the data collection (Heckman, 1979). As far as the sample is concerned, our panel was populated mainly by Italian consumers; therefore, investigating different types of consumers in terms of cultural heritage and in terms of cohorts might reveal differences in the technology assessment. Some digitally savvy markets, such as China and the United States, may highlight different results.

Moreover, although CA is a versatile and popular technique in multivariate analysis, it is still mostly a descriptive and exploratory method; therefore, the statistical significance of relationships should not be assumed, and it is not appropriate for hypothesis testing (Hair et al., 2010). Nonetheless, a CA may be helpful in detecting models that merit further consideration when using other methods (Hoffman & Franke, 1986). Future research directions are likely to integrate computationally based cross-validation methods with field studies or experiments.

Finally, while it represents a start, our work is obviously not the last word on this important topic, and we recommend future studies to include more technologies and more nuanced affective and cognitive beliefs and analyse how it is challenged or empowered by the role of the sales assistant in phygital retail. At the same time, as pointed out by Paul et al. (2023) discussing about Chat GPT, despite the great potential technologies have in enhancing consumer engagement and improving marketing practices, future research should consider the potential concerns about ethical considerations, consumer privacy and security.

6 | CONCLUSIONS

The phygital experience is argued to be a game changer for luxury retailing (Lawry, 2023; Schmitt et al., 2021). In this challenging context, marketers have limited experience in designing and evaluating phygital technologies in terms of consumers' perceptions. Given the high investment in the adoption of innovative technologies, it is pivotal to understand which elements can minimize and prevent consumer resistance to technology. The current study fills this gap by conceptualizing and addressing the technological advances that contribute to enhancing phygital luxury experiences from a consumer point of view. As a result of our study, luxury brands are encouraged to adopt technologies that counterbalance functionality and exclusivity, prioritizing the hedonic experience and increasing consumer engagement within stores. These two components, functionality and exclusivity, are key levers to manage to build profitable and durable relationships with tech-savvy customers and new generations, attracted by immersive technologies and expecting seamless customer experiences across the shopping journey.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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