

## Validating a Proposed Model on the Factors that Influence Consumers' Unique Phygital and Memorable Shopping Experiences in Phygital Retail Outlets

**Athanasios KARAGIOUMLEZIS**

Hellenic Open University  
std157489@ac.eap.gr

**George SPAIS**

Hellenic Open University  
spais.georgios@ac.eap.gr

### Article history

Received 19 October 2024 | Accepted 29 November 2024 | Published online 09 December 2024.

### Abstract

Our study, grounded in Social Exchange Theory, examines how customer needs, hedonic factors, cross-channel integration, and consumer experiences impact the physical shopping experience. The research aim is to validate a proposed model by surveying Greek consumers at phygital stores and examining the moderating effects of gender and generation to strengthen the foundation for future research. We survey 229 Greek consumers using a structured questionnaire, testing twelve hypotheses—eight were supported. Consumer needs, expectations, and experiences in phygital shopping are positively correlated, according to our findings, which are confirmed by linear regression and confirmatory factor analysis. Notably, hedonic factors improve interactions with customers, especially in distinctive retail settings. Additionally, we find a positive but non-linear relationship between cross-channel integration and customer experiences that is consistent across generations and genders. For marketing scholars and marketing managers in the retail sector, this study has important implications.

**Keywords:** Phygital retail, phygital shopping experience, customer experience, hedonic factors, cross-channel integration, explainable artificial intelligence.

**JEL classification:** M31, M39.

### Introduction

Consumers can now shop from home and make in-store purchases thanks to innovations like "buy online, pick up in-store" (BOPIS). Mobile retail sales are expected to reach \$856 billion by 2027, demonstrating the rapid expansion of digital commerce (Coppola, 2024). Consumers achieve hybrid buying behavior, combining convenience from online and offline shopping as the pandemic fades away. The era of digitalization has taken the retail sector to phygital retailing, as will be studied today, a combination of digital and physical activities to provide consumers with a better shopping experience.

According to the term "phygitality", coined in 2021, consumers want a mixed shopping experience. This study investigates how shopping characteristics are influenced by gender and generation and how cross-channel integration and explainable AI can improve in-person experiences by using recommendation systems. The investigation of shopping characteristics affected by different genders and generations is the prime focus of this study, as how cross-channel integration uses explainable AI-enhanced in-person experiences using recommendation systems. As Batat (2019) explained, "phygital" emphasizes that purchasing behaviors require a different perspective on how physical stores can co-exist alongside — and potentially connect with — digital buying experiences. Additionally, Bonfanti et al. (2023)

highlight the increase in digital engagement across retail and see this mix as causing a physical response.

Research on 'phygitality' is still in its infancy, despite its growing presence in everyday retail practices. Empirical studies examining the nuanced impact of gender, generation, and cross-channel integration on phygital shopping experiences remain sparse, although discussions on this hybrid consumer experience have emerged in journals like the *Journal of Strategic Marketing* (2021). This study seeks to fill that gap by comprehensively analyzing how these variables shape consumer behavior in phygital retail environments while integrating the role of explainable AI in recommendation systems. Yao et al. (2024) highlight the importance of understanding consumer behavior in phygital contexts, suggesting that AI integration enhances decision-making during the consumer journey, highlighting that the influence of AI on consumer behavior is significant through personalized recommendations. Yazdani and Darbani (2023) note that emotional connections with AI tools can also impact behavior, making explainable AI essential for fostering trust and engagement. Mele et al. (2023) identified four key elements: objects and applications, context, customer journey, and buying experience. Our study focuses on consumer behavior in omnichannel retail, drawing on insights from phygital retailing and shopping (Bonfanti et al., 2023). We aim to explore how AI advancements, hedonic factors, explainable recommendations, cross-channel integration, and consumer expectations of in-store technologies influence memorable shopping experiences in phygital retail outlets. This study explores the above characteristics that shape memorable phygital shopping experiences in retail. We validate a proposed model by surveying Greek consumers at phygital stores, examining the moderating effects of gender and generation to strengthen the foundation for future research.

The research objectives of our study are based on the critical works by Banik and Gao (2023), Mishra et al. (2023), Bonfanti et al. (2023), and Zimmermann et al. (2023). *First, we investigate the impact and the nature of the relationships between consumer needs and expectations within in-store technologies for utilitarian, playfulness, hedonic, and social experiences and memorable phygital shopping experiences of Greek consumers who shop from phygital retail outlets. Second, we investigate the impact and the nature of the relationships between explainable artificial intelligence (AI) in recommendation systems and memorable phygital shopping experiences of Greek consumers who shop from phygital retail outlets. Third, we investigate the mediating effect of consumer experiences in phygital retailing between hedonic factors and memorable phygital shopping experiences of Greek consumers who shop from phygital retail outlets. Fourth, we investigate the mediating effect of consumer experiences in phygital retailing between consumers' ability to control their purchase choices ("cross-channel integration") and memorable phygital shopping experiences of Greek consumers who shop from phygital retail outlets. Fifth, we investigate the moderating roles of gender and generation in the relationships among hedonic factors, cross-channel integration, and Greek consumers' experiences in phygital retailing who shop from phygital retail outlets.*

Below are the initial assumptions of the study, highlighting the thoroughness of our research:

Consumers are looking to be engaged mentally and emotionally to have a satisfying phygital retail experience, and this the retailer amplifies through appealing environments and meaningful connections. Even though omnichannel approaches present personalized experiences, inexperienced shoppers may feel confused due to perceived risks. Mobile and interactive devices play a significant role as they advance the technological development that supports continuity of digital-physical media, therefore enhancing the consumer digital transformation experience.

## **1. Theoretical framework, research model and literature support**

### **1.1. Social Exchange Theory**

Social exchange theory (SET) views relationships as exchanges to balance benefits and costs. SET, developed by George Homans in his 1958 essay and later expanded by Richard Emerson and Peter Blau, suggests that social interactions create mutual responsibilities. People rationally act to minimize costs and maximize benefits, including intangible socioemotional outcomes and tangible resources (e.g., Banik & Gao, 2023). Redmond (2015) outlines five critical aspects of Social Exchange Theory, emphasizing that economic principles influence human decisions and shape social behavior through costs and incentives. In social interactions, people aim to maximize their gains and minimize their losses. Interdependence arises when resources benefit both sides. Because asking for advice promotes reciprocal relationships, especially when equity is upheld, sociologists should modify economic assumptions to fit interpersonal relationships.

Relative studies place a great emphasis on status, affiliation, pleasure, and attachment as intangible resources for the motivations of consumers (Blau, 1964, as cited in Banik & Gao, 2023). By this, it presupposes that consumers consider the socioemotional aspects while valuing a firm's offering. Phygital retailing triggers cognitive processes like mental attachment and emotional expression that eventually upgrade the consumer retail experience. In contrast, Mishra et al. (2023) observe that consumers could feel discouraged from investigating physical options, given that perceptions of retailer unreliability may be in the way, especially in some markets, where such unreliability derails overall satisfaction.

### **1.2. Theoretical model and assumptions**

To comply with these consumers' needs for experiences that must be rational, useful, economic, and practical, retailers use various technologies. Bofanti et al. (2023) illustrate that their model involves six in-store technologies: (3) wireless communication technologies, including proximity devices such as NFC tags and RFID; in-store activation involving light, screen, sound; support devices, which include chargers to let customers charge their smartphones; mobile apps to order, request, scan, or check on the availability of not-in-store products; and smartphones, tablets, displays, touchscreens, computers.

Wait times are decreased by in-store digital devices, which make it simple to shop on laptops, tablets, or smartphones. In a high-tech retail setting, features like "scan-and-go" improve transaction experiences, and digital tools encourage interaction between customers and employees. Through mobile devices and messaging apps, technology meets customer needs and promotes community-based brand experiences. Retailers blend digital and physical channels to create enjoyable shopping experiences using three strategies: physical (in-store), digital (electronic), and phygital (smart store immersion). Emerson (1976) highlights reciprocity in social exchange, though Homan's theory has faced criticism (Cook et al., 1983).

The fundamental assumptions are: (1) Participants try to raise their gains in an exchange; (2) Human beings derive gratification from social exchange; (3) Because of access to social, economic, and psychological information, people can perceive more rewarding alternatives for interaction, which promotes goal-directed exchange within the bounds of cultural norms; (4) Social credit is preferred to social debt and the value of an act is directly related to its deprivation. Last assumptions are that humans act rationally; profitable competition is preferred as punishment is readily avoided.

### 1.3. Hypotheses development

Bonfanti et al. (2023) highlight that integrating digital technologies in physical stores enhances consumer experiences by addressing utilitarian, hedonic, entertainment, and social needs. They find that technology fosters immersive experiences in phygital retail. Zimmermann et al. (2023) reviewed AI recommender systems and stated that AI improves interactivity, offering a unique shopping experience. Batat (2022b) has argued that today's consumers push retailers to develop innovative experiences at the intersection of digital and physical. Batat (2022a) identifies key pillars of phygital customer experience, including practicality, sociability, sensoriality, and technicality. A survey by Mosquera et al. (2018) shows a positive relationship between in-store digital technology use and purchase intentions. Therefore, we can state:

**H1:** *Consumer needs and expectations within in store technologies for utilitarian, hedonic and social experiences positively influence the unique phygital and memorable shopping experiences.*

It further states that consumers also gain from the incorporation of digital technologies into physical **retail** stores in ways that may enhance their decision-making capability, make access to product information more accessible, and provide them with a feeling of saving time. The connection will improve the relationship of retailers with their customers. Research by Stein and Ramaseshan (2020) indicates that retail technology impacts consumers motivated by hedonic factors more significantly than those with utilitarian needs. Zimmermann et al. (2023) found that AI recommender systems enhance utility and entertainment in-store. While Zhang et al. (2024) stress that convenience in the use of retail technology would lead to superior customer experiences, Bonfanti et al. (2023) have researched whether technology is applied to satisfy customer expectations. In contrast, Pusceddu et al. (2023) depict scenarios where tech-savvy customers remained unsatisfied with the technology and less tech-savvy ones had difficulty using it, thus abandonment of purchases took place. Consequently, we can assert:

**H2:** *Consumer needs and expectations within in store technologies for utilitarian, hedonic and social experiences positively influence the consumer experiences in phygital retailing.*

The use of AI in marketing is on the rise, with 73% of U.S. companies employing it in 2023 (Kshetri et al., 2024). Research by Zimmermann et al. (2023) shows that AI enhances customer experience in physical retail by serving as a personal recommender. However, some consumers report increased irritation due to AI usage. Bilal et al. (2024) also found that AI positively influences customer experience and purchase intention on social media. Personalization in AI positively impacts customer experience (Kshetri et al., 2024). AI creates tailored content by processing extensive data and interacting with online sources. Consumers expect high service levels from AI, as highlighted by Song and Kim (2022) in their study on retail service robots. Wang et al. (2024) note that the perceived experience with AI affects customer engagement. Retail technologies like voice assistants, chatbots, and image search also enhance customer experience (Quinones et al., 2023), and thus, we can state:

**H3:** *Explainable artificial intelligence positively influences the unique phygital and memorable shopping experiences.*

Hedonic factors such as emotions and creativity can greatly improve a consumer's shopping experience (Sachdeva & Goel, 2015). Research shows that these factors, such as joy and delight, lead to better customer involvement and loyalty especially in the field of technology (Stein & Ramaseshan, 2020). Banik and Gao (2023) highlight that mental imagery and aesthetics impact experiences in phygital stores. Similarly, Kumar et al. (2024) found that emotional factors influence customer intentions in the phygital banking sector. Banik (2021) also noted that pleasure affects consumer engagement and willingness to continue shopping in phygital settings, and thus we can state:

**H4:** *Hedonic factors including mental imagery, entertainment and aesthetics, positively influences the consumer experiences in phygital retailing.*

Zhang et al. (2024) highlight that cross-channel integration is the wave of the future and will give a better consumer experience because it will be interconnected and provide personalized content for utilitarian and hedonic purposes. This better experience increases loyalty. According to Nguyen (2021), perceived transparency, content consistency, channel availability, and flexibility are all critical factors in the omnichannel consumer experience and loyalty in cross-channel integration. While Gao et al. (2021) explore how the degree of integration among different variables (marketing promotions, customer service, etc.) influences the customer experience and facilitates omnichannel shopping, Quach et al. (2022) corroborate these findings. These results are consistent with Mosquera et al. (2018) theoretical framework. Therefore, we can state:

**H5:** *Cross-channel integration positively influences the consumer experiences in phygital retailing.*

According to Sachdeva and Goel (2015), unforgettable shopping moments can enhance consumer loyalty and repurchase intentions through a great consumer experience (Khan et al., 2020a; Stein & Ramaseshan, 2020). Strong brand attachment often arises from intense consumer encounters (Huaman-Ramirez & Merunka, 2019). According to Bonfanti et al. (2023) in-store technology will create unique in-person shopping experiences and this will be a necessity for stores to differentiate themselves from their competitors. Banik and Gao (2023) states that the consumer experience is a positive factor in satisfaction in physical retailing. Batat (2022b) states that a tactile experience is one way a business can distinguish itself from the competition. Nonetheless, Pusceddu et al. (2023) state that some consumers may have problems with the technology, leading to dissatisfaction. Therefore, we can state that:

**H6:** *Consumer experiences in phygital retailing positively influences the unique phygital and memorable shopping experiences.*

Past research states that to provide a unique shopping experience, retailers must provide cognitive and emotional stimulation in their stores. Since shopping atmospheres affect shoppers' moods and behaviours, hedonic attributes that stimulate consumers' senses are a must (Sachdeva & Goel, 2015). All these factors are imperative for a differentiated physical customer experience (Batat, 2022a). Bonfanti et al. (2023) highlight how in-store technologies enhance consumer experiences by fulfilling hedonic needs through emotional and immersive interactions. By enhancing customer loyalty and extending in-store time, this combination can draw target markets (Sachdeva & Goel, 2015), and thus we can state:

**H7:** *Hedonic factors including mental imagery, entertainment and aesthetics, positively influences the unique phygital and memorable shopping experiences through the intermediate effect of consumer experiences in phygital retailing.*

Research shows that seamless cross-channel integration leads to higher customer satisfaction (Mishra et al., 2023; Asmare & Zewdie, 2022; Lemon & Verhoef, 2016) have noticed that it suits customer loyalty. This integration allows real-time interaction with retailers, price comparisons, and increased customer retention because it allows the customer to interact on multiple channels simultaneously. As Nguyen (2021) points out, an integrated experience can lead to customer loyalty. As Batat (2022a) states offering differentiated experience in brick-and-mortar atmospheres is a whole different story. Also, Banik and Gao (2023) state that 50% of shoppers (even those in high maintenance sectors) favor combined brick and mortar and electronic shopping. Therefore, we can state:

**H8:** *Cross-channel integration positively influences the unique phygital and memorable shopping experiences through the intermediate effect of consumer experiences in phygital retailing.*

Banik and Gao (2023) found that female consumers are more influenced by hedonic factors like mental imagery, entertainment, and aesthetics in their retail experiences, highlighting the moderating role of gender in phygital retailing. Ameen et al. (2021) confirmed that women prioritize aesthetics, while men focus on in-store technologies. For example, in the UAE, male consumers showed greater interest in luxury offerings. Jayasingh et al. (2022) reported that women have higher hedonic motivation in omnichannel shopping. Tarka et al. (2023) noted that women are drawn to hedonistic experiences for emotional rewards, contrary to men's tendency to avoid shopping. Kim et al. (2021) discovered that men and women react differently to mental imagery, with men showing heuristic responses and women displaying cognitive approaches, and thus we can state:

**H9a:** *Gender moderates the relationship between hedonic factors and consumer experiences in phygital retailing.*

Research indicates that men and women have different priorities when integrating marketing channels. Joshi et al. (2024) found that men prioritize a quick purchase process, on-time delivery, low shipping costs, and convenience, while women focus on accessible product returns and combined shipments. Mosquera et al. (2018) noted that men emphasize utility (discounts, availability), whereas women seek a more extensive product assortment and easier fitting room access. Natarajan et al. (2023) discovered that female customers value service transparency, detailed information, and personalized service. For instance, in fashion retail, Pandey and Chawla (2018) found men are more likely to use online channels and are more sensitive to poor online service than women. Jayasingh et al. (2022) reported that women demand higher performance from integrated channel technology, and therefore, we conclude:

**H9b:** *Gender moderates the relationship between cross-channel integration and consumer experiences in phygital retailing.*

Consumers from different generations respond to marketing stimuli in distinct ways. Younger consumers spend more time evaluating product information and seeking engaging, emotionally charged marketing, while older generations prioritize utilitarian factors and display more emotional control. Khan et al. (2020b) found that younger generations tend to be more emotionally attached to brands, this in turn leads to greater brand loyalty. Furthermore, Tarka et al. (2023) found that younger shoppers are more interested in a stimulating shopping experience than older shoppers who place a higher value on usability. Burnsed and Bickle (2015) states that millennials and Gen Xers are searching for entertainment when they shop. In contrast, Liang and Xu (2018) found that Millennials perceive higher hedonic value in second-hand fashion than Gen X. Therefore, we can state:

**H10a:** *Generation moderates the relationship between hedonic factors and consumer experiences in phygital retailing.*

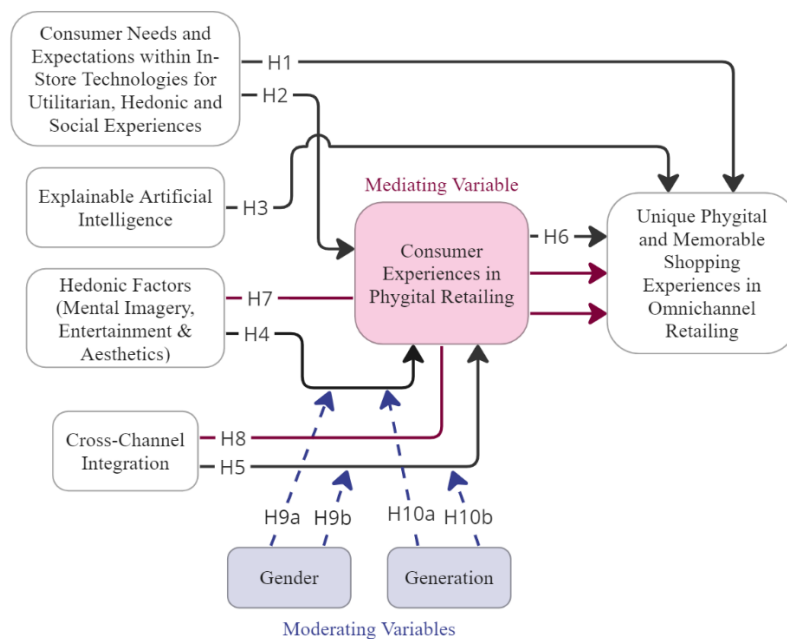
Research indicates that different generations have varying preferences for marketing channels. Younger consumers prioritize convenience, fast checkouts, and secure payments (Joshi et al., 2024). Late Generation X and early Millennial women favor omnichannel shopping (Mosquera et al., 2018), while Baby Boomers are less inclined to use mobile shopping (Lissitsa & Kol, 2021). Younger consumers also prefer companies with a solid online presence (Khan et al., 2020a). Most phygital retail consumers are Gen Z (Banik & Gao, 2023), though older generations hesitate to adopt phygital technologies (Pusceddu et al., 2023). However, recent studies show that older generations increasingly use cross-channel retail and engage with digital technologies (Chandra & Islam, 2024). Thus, we can state:

**H10b:** *Generation moderates the relationship between cross-channel integration and consumer experiences in phygital retailing.*

**Table 1. Operational definitions of the key constructs**

Constructs	Definitions	Sources
Consumer Needs and Expectations on In-Store Technologies	Customer needs, the benefits the customer aims to obtain, and expectations, customer predictions about the purchase journey, regarding in-store technologies for utilitarian, hedonic and social experiences.	Bonfanti et al. (2023)
Explainable Artificial Intelligence	The use of AI systems that provide understandable explanations for their decision-making processes in phygital retail stores, e.g. in recommender systems	Zimmermann et al. (2023); Minh et al. (2022)
Hedonic Factors (Mental Imagery, Entertainment, Aesthetics)	Mental imagery – the pre-consumption image the consumer holds about the product, entertainment – the pleasurable state of mind during the purchase journey, and aesthetics – the sensory stimulation qualities of the product.	Banik and Gao (2023)
Cross-Channel Integration	The integration of different marketing channels to benefit both the retailer and its customers.	Mishra et al. (2023)
Consumer Experiences in Phygital Retailing	The mental, emotional, physical, sensory, and social aspects that characterize a customer's interaction with a phygital retail store.	Banik and Gao (2023)
Unique Phygital and Memorable Shopping Experiences	The differentiated and memorable combination of physical and digital shopping experience simultaneously, in a physical retail store.	Bonfanti et al. (2023); Batat (2022a)

Source: Authors



**Figure 2. Research model**

Source: Authors

## 2. Methodology

### 2.1. Research method, sample, sampling strategy, process and data collection

Our study uses a questionnaire survey method to gather quantitative data from a predefined group. We employ a self-administered structured questionnaire (SAQ), eliminating interviewer bias and enhancing data quality. Our questionnaire survey used convenience sampling, recruiting students from the Hellenic Open University and colleagues willing to complete the online questionnaire. We shared the survey on Greek public forums and Facebook. The sample includes Greek consumers from the Baby Boomers, Generation X, Millennials, and Generation Z who have experienced phygital retail. The study sample includes (1) Greek consumers visiting retail stores with advanced digital technologies; (2) Consumers from various generations (Baby Boomers, Generation X, Millennials, Generation Z) who have shopped at phygital stores; (3) Data collected from major Greek cities (Athens, Thessaloniki, Patras, Xanthi, Piraeus); (4) Data collection period: March 1 to May 18, 2024.

### 2.2. Measures, measurement of variables and variables' level of measurement

To meet the study's requirements, we created a structured questionnaire of fifteen closed-ended questions measured with a Likert scale. Participants indicate their agreement on a 5-point scale from "strongly disagree" to "strongly agree" (Taherdoost, 2019). We chose the point scale based on the foundation of related studies. The questionnaire includes both nominal and ordinal variables. Ordinal scales categorize values with a ranking, while nominal scales do not imply order. For example, gender and age are nominal variables. Ordinal variables involve predetermined rankings in questionnaire responses.

In our study, we define several key concepts: (1) "Consumer Needs and Expectations (CNE)": Benefits sought from in-store technologies for utilitarian, hedonic, and social experiences (Bonfanti et al., 2023), (Measurement: ordinal). (2) "Explainable Artificial Intelligence (EAI)": AI systems providing understandable insights into decision-making in phygital retail (Banik & Gao, 2023; Zimmermann et al., 2023), (Measurement: ordinal). (3) "Hedonic Factors (HEF)": Consumer imagery of products, entertainment, and sensory qualities during the purchase journey (Banik & Gao, 2023), (Measurement: ordinal). (4) "Cross-Channel Integration (CCI)": Integration level among various marketing channels (Mishra et al., 2023), (Measurement: ordinal). (5) "Consumer Experiences in Phygital Retailing (CEPR)": Emotional, physical, sensory, and social interactions in phygital stores (Banik & Gao, 2023), (Measurement: ordinal). (6) "Unique Phygital and Memorable Shopping Experiences (UPMSE)": Distinctive and memorable shopping experiences combining physical and digital elements (Bonfanti et al., 2023), (Measurement: ordinal).

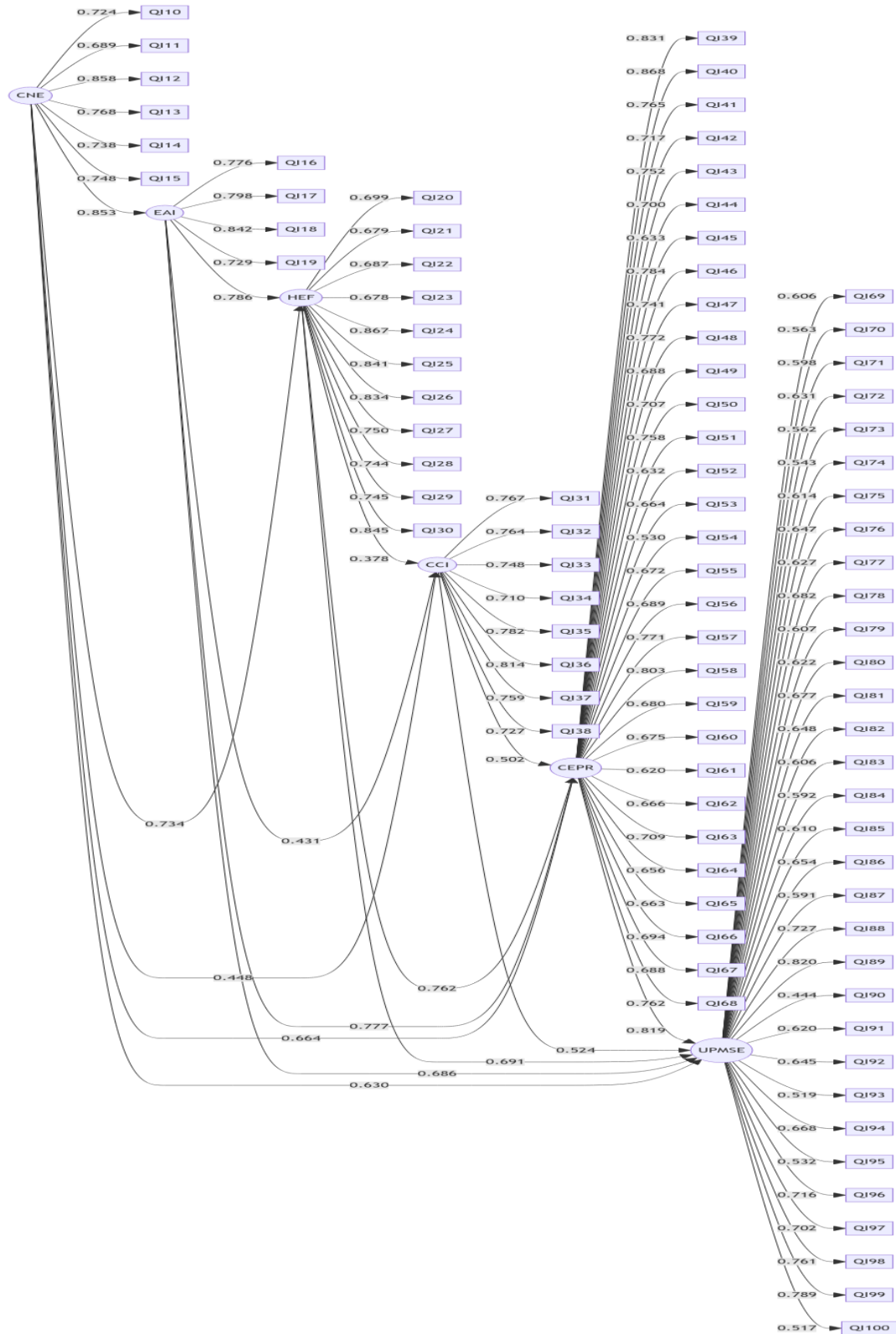
## 3. Research results

### 3.1. Confirmatory Factor Analysis

#### *Model specification*

Confirmatory factor analysis was conducted to assess the validity of our constructs using the Lavaan package within JASP software. There are 6 factors (QI10\_CNE1 to QI15\_CNE6) that make up CNE which is the customer's needs and desires from in-store technologies. The standard errors range from 0.029 to 0.044 and the estimates from 0.689 to 0.858. CNE Factor 1": CNE has 6 indicators (QI10\_CNE1 to QI15\_CNE6) which determine the customer's needs and wants from in-store technologies. The standard errors go from 0.029 to 0.044, and the estimates go from 0.689 to 0.858.





**Figure 3. CFA path diagram CNE: Consumer Needs and Expectations on In-Store Technologies, EAI: Explainable Artificial Intelligence, HEF: Hedonic Factors (Mental Imagery, Entertainment, Aesthetics), CCI: Cross-Channel Integration, CEPR: Consumer Experiences in Phygital Retailing, UPMSE: Unique Phygital and Memorable Shopping Experiences.**

Source: Authors

"Factor 2: EAI" focuses on explainable AI, with four indicators (QI16\_EAI1 to QI19\_EAI4), estimates from 0.729 to 0.842, and standard errors from 0.029 to 0.03. "Factor 3: HEF" deals with hedonic aspects like mental imagery and aesthetics, including 11 indicators (QI20\_HEFmi1 to QI30\_HEFa4), estimates from 0.678 to 0.867, and standard errors from 0.019 to 0.046. "Factor 4: CCI" concerns cross-channel marketing benefits, with eight indicators (QI31\_CCI1 to QI38\_CCI8), estimates from 0.710 to 0.814, and standard errors from 0.035 to 0.043. "Factor 5: CEPR" covers in-store consumer experiences, consisting of 30 indicators (QI39\_CEPRre1 to QI68\_CEPRt12), with estimates from 0.530 to 0.868 and standard errors from 0.018 to 0.049. "Factor 6: UPMSE" relates to unique shopping experiences in Phygital retail, featuring 32 indicators (QI69\_UPMSEfe1 to QI100\_UPMSEpe13), estimates from 0.444 to 0.820, and standard errors from 0.023 to 0.049.

A diagonally weighted least squares (DWLS) estimator was used with robust standard errors, as recommended for ordinal data and a sample size close to our  $N=229$  (e.g., Doval et al., 2023).

#### *Model fit assessment*

The estimates indicate strong construct validity, with high standardized estimates and narrow confidence intervals; all p-values are less than 0.001, reflecting high statistical significance. The CFA model shows an acceptable fit (RMSEA=0.098, SRMR=0.089, CFI=0.963, NFI=0.946, TLI=0.962, GFI=0.953) based on Schermelleh et al. (2003). The chi-square test was insignificant ( $p < 0.001$ ), which is justifiable given the sample size and model complexity.

#### *Factor loadings, significance, reliability and internal consistency*

All loadings are significant ( $p < 0.01$ ), with confidence intervals excluding zero. The overall mean estimate for 91 indicators is 0.698. Mean estimates per factor are: CNE: 0.754, EAI: 0.786, HEF: 0.761, CCI: 0.759, CEPR: 0.710, and UPMSE: 0.629. Most factors have mean loadings  $> 0.7$ , except UPMSE. Notably, 45 loadings are  $\geq 0.7$ , 45 are  $\geq 0.5$  but  $< 0.7$ , and 1 is  $< 0.5$ . The highest loading is 0.868 (QI 40, CERP) and the lowest is 0.444 (QI 90, UPMSE). Reliability analysis using Cronbach's alpha and McDonald's  $\omega$  coefficients showed Cronbach's alpha ranged from 0.823 to 0.953, with the CEPR scoring 0.953, suggesting possible redundancy. McDonald's  $\omega$  coefficients also exceed 0.8, confirming good reliability.

### **3.2. Hypothesis testing**

H1: There is a linear positive monotonic relationship between consumer needs and expectations on in-store technologies (CNE) and unique phygital and memorable shopping experiences correlation (UPMSE). The equation that explains the relationship is:

$$Y = 1.93 + 0.43 \times X$$

H2: There is a linear positive monotonic relationship between consumer needs and expectations on in-store technologies (CEPR) and consumer needs and expectations on in-store technologies (CNE) and consumer experiences in phygital retailing (CEPR), therefore H2 is supported. The equation that explains the relationship is:

$$Y = 1.69 + 0.49 \times X$$

H3: There is a nonlinear positive monotonic relationship between consumer needs and expectations on in-store technologies (CNE) and consumer experiences in phygital retailing (CEPR). The equation that explains the relationship is:

$$Y = 1.62 + 1.21 \times X - 0.35 \times X^2 + 0.05 \times X^3$$

H4: There is a positive linear monotonic relationship between hedonic factors (HEF) and consumer experiences in phygital retailing (CEPR), therefore H4 is supported. The equation that explains the relationship is:

$$Y = 1.58 + 0.6 \times X$$

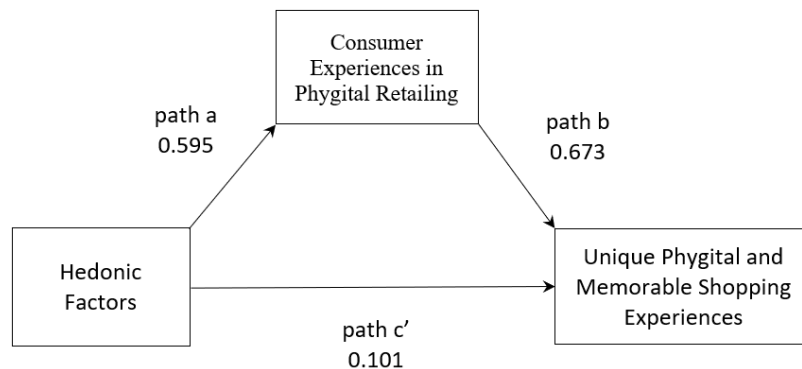
H5: There is a nonlinear positive monotonic relationship between cross-channel integration (CCI) and consumer experiences in phygital retailing (CEPR). The equation that explains the relationship is:

$$Y = 3.19 - 0.3 \times X + 0.09 \times X^2$$

H6: There is a linear positive monotonic relationship between consumer experiences in phygital retailing (CEPR) and unique phygital and memorable shopping experiences (UPMSE). The equation that explains the relationship is:

$$Y = 0.83 + 0.77 \times X$$

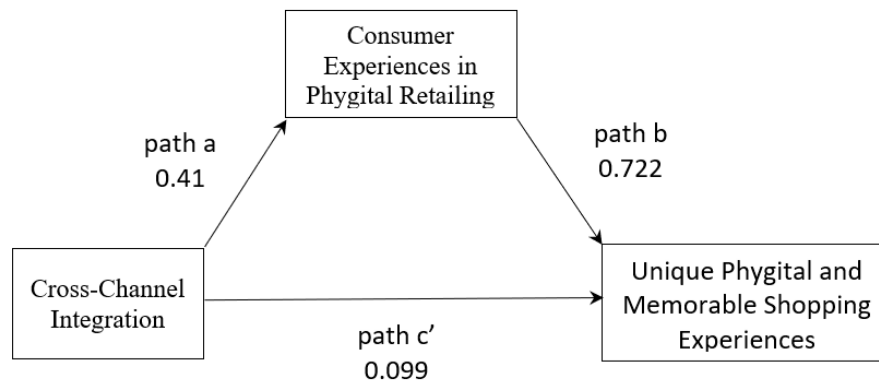
H7: The mediation analysis results a significant model ( $p < 0.01$ ) showing a significant effect of CEPR on UPMSE ( $p < 0.01$ ), a significant effect of HEF on CEPR ( $p < 0.01$ ) and a significant direct effect of HEF on UPMSE ( $p < 0.05$ ). The bootstrapped confidence interval confirms significance at the 0.05 level. The results are consistent with mediation.



**Figure 4. Indirect effect of Hedonic Factors on Unique Phygital and Memorable Shopping Experiences through Consumer Experiences in Phygital Retailing**

Source: Authors

H8: The mediation analysis results a significant model ( $p < 0.01$ ) showing a significant effect of CEPR on UPMSE ( $p < 0.01$ ), a significant effect of CCI on CEPR ( $p < 0.01$ ) and a significant direct effect of CCI on UPMSE ( $p < 0.01$ ). The bootstrapped confidence interval confirms significance at the 0.05 level. The results support mediation.



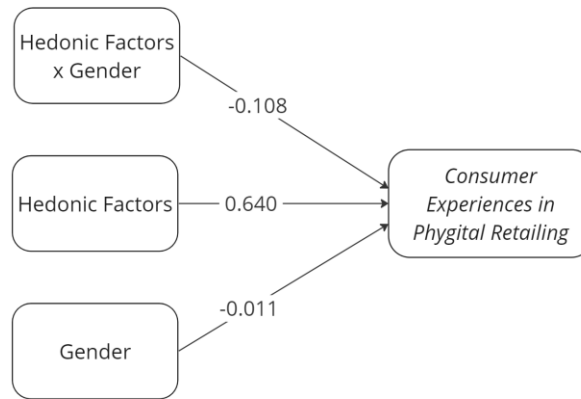
**Figure 5. Indirect effect of Cross-Channel Integration and Unique Phygital and Memorable Shopping Experiences through Consumer Experiences in Phygital Retailing**

Source: Authors

H9a: The analysis results a significant model ( $p < 0.01$ ) showing a significant effect of HEF on CEPR ( $p < 0.01$ ) and an  $R^2 = 0.572$ . However, neither the effect of gender on CEPR ( $p = 0.812 > 0.05$ ), nor the effect of the product interaction term of gender and HEF ( $p = 0.124 > 0.05$ ) was significant on the 0.05 level. Bootstrapping produced similar results

because the bootstrapped confidence intervals include zero. As a result, there is insufficient evidence. The regression equation follows.

$$CEPR = 3.477 + 0.64 \times HEF - 0.011 \times GENDER - 0.108 \times HEF \times GENDER$$

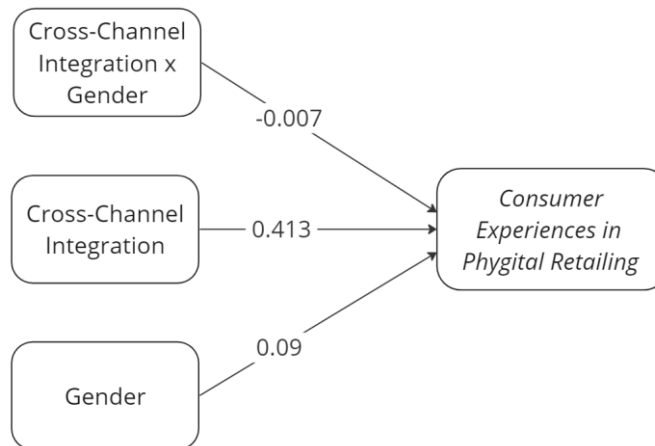


**Figure 6. Moderating effect gender on the relationship between hedonic factors and consumer experiences in phygital retailing**

Source: Authors

H9b: The analysis results a significant model ( $p < 0.01$ ) showing a significant effect of CCI on CEPR ( $p < 0.01$ ) with a low  $R^2 = 0.195$ . However, neither the effect of gender on CEPR ( $p = 0.89 > 0.05$ ), nor the effect of the product interaction term between gender and CCI ( $p = 0.953 > 0.05$ ) was significant on the 0.05 level. Bootstrapping confirms the results because the bootstrapped confidence intervals include zero. In summary there is insufficient evidence to support the hypothesis. The regression equation follows.

$$CEPR = 3.466 + 0.413 \times CCI + 0.09 \times GENDER - 0.007 \times CCI \times GENDER$$



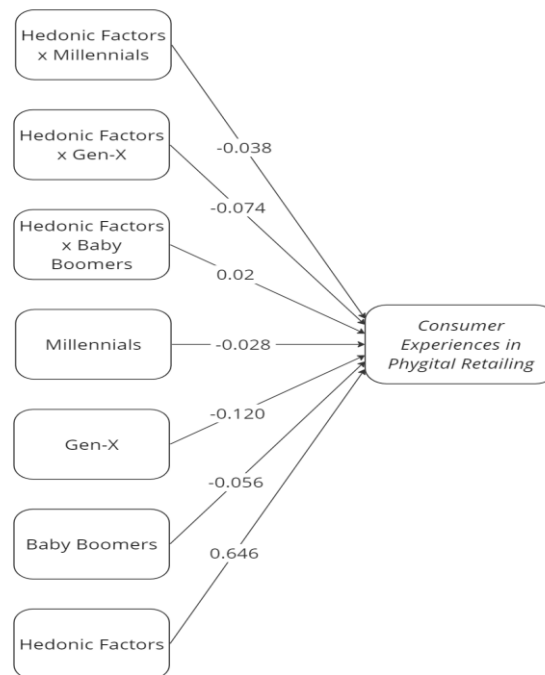
**Figure 7. Moderating effect gender on the relationship between hedonic factors and consumer experiences in phygital retailing**

Source: Authors

H10a: The analysis results a significant model ( $p < 0.01$ ) showing a direct effect of HEF on CEPR ( $p < 0.01$ ) and  $R^2 = 0.576$ , however neither any of the generation indicator variables, nor any of the product interaction terms were significant at the 0.05 level (product terms: Gen-Z=reference, Millennials:  $p = 0.791 > 0.05$ , Gen-X:  $p = 0.615 > 0.05$ , Baby Boomers:

$p=0.993>0.05$ ). As a result, there is insufficient evidence to support the hypothesis. The regression equation follows.

$$CEPR = 3.537 + 0.646 \times HEF - 0.028 \times MILLENNIALS - 0.12 \times GEN\_X - 0.056 \times BABY\_BOOMERS - 0.038 \times HEF \times MILLENNIALS - 0.074 \times HEF \times GEN\_X + 0.02 \times HEF \times BABY\_BOOMERS$$

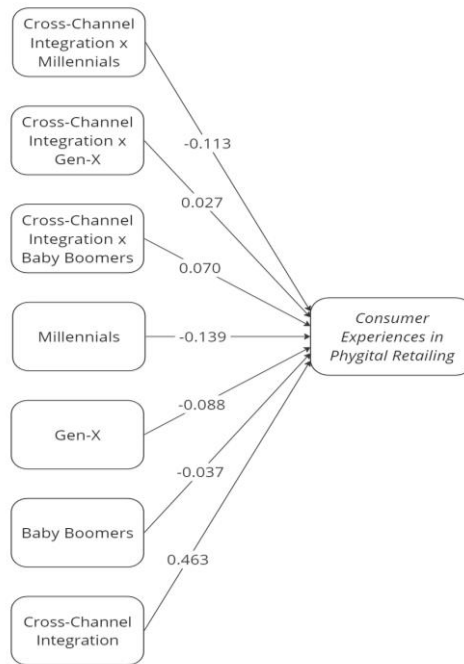


**Figure 8. Moderating effect generation on the relationship between hedonic factors and consumer experiences in phygital retailing**

Source: Authors

H10b: The analysis results a significant model ( $p<0.01$ ) showing a direct effect of CCI on CEPR ( $p<0.05$ ) and a low  $R^2=0.207$ , however neither any of the generation indicator variables, nor any of the product interaction terms were significant at the 0.05 level (product terms: Gen-Z=reference, Millennials:  $p=0.599>0.05$ , Gen-X:  $p=0.902>0.05$ , Baby Boomers:  $p=0.845>0.05$ ). As a result, there is insufficient evidence to support the hypothesis. The regression equation follows.

$$CEPR = 3.576 + 0.463 \times CCI - 0.139 \times MILLENNIALS - 0.088 \times GEN\_X - 0.037 \times BABY\_BOOMERS - 0.113 \times CCI \times MILLENNIALS + 0.027 \times CCI \times GEN\_X + 0.07 \times CCI \times BABY\_BOOMERS$$

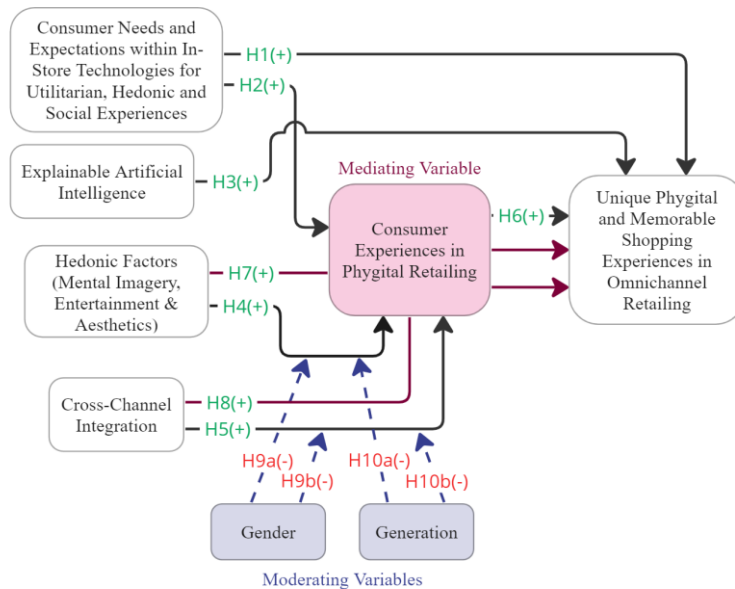


**Figure 9. Moderating effect generation on the relationship between hedonic factors and consumer experiences in phygital retailing.**

Source: Authors

### 3.3. Summary of research results

The following figure presents the research model including the research hypotheses results (see Figure 10).



**Figure 10. The research model including the research hypotheses results**

Source: Authors

The hypotheses’ testing results are presented in the following table including the level of significance (see Table 2).

**Table 2. Hypotheses' testing results**

Hypothesis	Support	Significance level
Research Hypothesis 1 (H1)	Supported	a=0.01
Research Hypothesis 2 (H2)	Supported	a=0.01
Research Hypothesis 3 (H3)	Supported	a=0.01
Research Hypothesis 4 (H4)	Supported	a=0.01
Research Hypothesis 5 (H5)	Supported	a=0.01
Research Hypothesis 6 (H6)	Supported	a=0.01
Research Hypothesis 7 (H7)	Supported	a=0.05
Research Hypothesis 8 (H8)	Supported	a=0.05
Research Hypothesis 9a (H9a)	Not Supported	a=0.05
Research Hypothesis 9b (H9b)	Not Supported	a=0.05
Research Hypothesis 10a (H10a)	Not Supported	a=0.05
Research Hypothesis 10b (H10b)	Not Supported	a=0.05

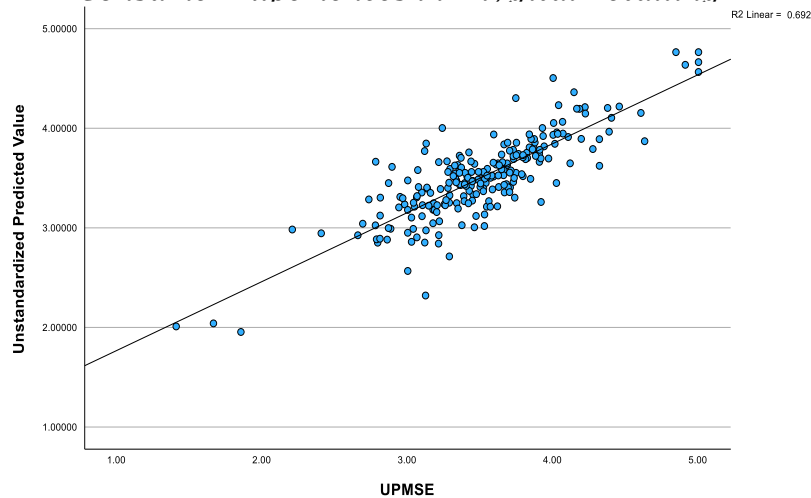
Source: Authors

### 3.4. Empirical tested model

We conduct a multivariate linear regression to estimate UPMSE based on CNE, HEF, CCI, and CEPR, excluding EAI for its insignificant effect ( $p=0.992$ ) and CNE ( $p=0.247$ ). After removing one outlier ( $Z$ -score  $> 3.29$ ), the final sample size was  $N=228$ . The model explained 69.2% of the variance in UPMSE ( $R^2 = 0.692$ ), showing a good fit with normally distributed residuals and a Durbin-Watson statistic of 1.923, indicating no autocorrelation. Building on Bonfanti et al. (2023), we explore what phygital shoppers seek in in-store technology and present a model merging digital and physical strategies. Retailers looking to increase customer engagement and loyalty will find this information useful. Figures 11 and 12 show the fitted line plot and the empirical tested model. The final regression equation follows.

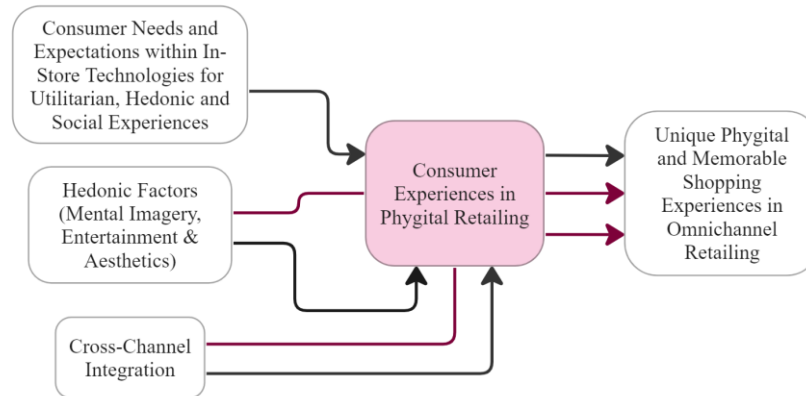
$$UPMSE = 0,612 + 0,1 \times HEF + 0,097 \times CCI + 0,633 \times CEPR$$

where *UPMSE* = Unique Phygital and Memorable Shopping Experiences, *HEF* = Hedonic Factors, *CCI* = Cross – Channel Integration, *CEPR* = Consumer Experiences in Phygital Retailing

**Figure 11. Regression fitted line**

Source: Authors

Based on the research results and the relative interpretation, the empirical tested model forms as follows:



**Figure 12. Empirical tested model**

Source: Authors

#### 4. Discussion

We accept H1, which states that consumer needs enhance the phygital shopping experience, and H2, which suggests these factors influence phygital retail experiences. The results align with the Bonfanti model (Bonfanti et al., 2023) and supports findings from Batat (2022a) and Mosquera et al. (2018). Concerning the second research objective, while Hypothesis 3 is supported, our regression model showed no distinct impact of explainable AI on the phygital shopping experience. Instead, we agree with Batat (2022a, 2022b) that phygital contexts should be viewed holistically. Our results contrast with those of Bilal et al. (2024) and Zimmermann et al. (2023).

The acceptance of H4 and H7 highlights that hedonic factors influence both in-store experiences and the overall phygital experience, linking mental imagery, entertainment, and aesthetics to retail shopping, consistent with several studies (Kumar et al., 2024; Banik & Gao, 2023; Banik, 2021; Stein & Ramaseshan, 2020; Sachdeva & Goel, 2015). Additionally, the acceptance of H5 and H8 emphasizes the positive impact of cross-channel integration on creating a unique phygital shopping experience, aligning with the integrated approach phygital offers and findings from other researchers (Zhang et al., 2024; Mishra et al., 2023; Quach et al., 2022; Gao et al., 2021; Nguyen, 2021).

Both hedonic factors and cross-channel integration significantly impact phygital customers, with a slight preference for the hedonic approach. Our study emphasizes the direct influence of in-store experiences on phygital shopping, supporting the idea that consumers assess offerings through socioeconomic criteria, as suggested by social exchange theory. These findings, aligned with Bonfanti et al. (2023), Banik and Gao (2023), and Batat (2022b), highlight the added value of phygital experiences for customers.

Our study could not identify any moderating effects of gender or generation on the relationships between hedonic factors, cross-channel integration, and the unique phygital shopping experience. Consequently, we rejected H9a and H9b and cannot confirm the findings by Banik and Gao (2023) and others on gender. Additionally, with H10a and H10b rejected, we cannot validate the generational effects that Khan et al. (2020b) and others noted.



#### 4.1. Theoretical and research implications

The Social Exchange Theory (SET) is crucial for understanding consumer behavior in omnichannel retailing, particularly in creating memorable phygital shopping experiences. SET highlights the importance of reciprocity and trust, as customers expect seamless interactions across all channels. When retailers meet these expectations, consumers are more likely to be loyal and make repeat purchases (Salviati et al., 2022). They also evaluate the benefits and drawbacks of their shopping experiences. Omnichannel retailers can enhance positive experiences by balancing effort and value through personalized offers and efficient logistics (Ahmad et al., 2023).

Exchanges are the foundation of any relationship, and nowhere is this truer than in retail. Retailers can make that bond even closer using data to personalize customer touchpoints. Identifying what financial, informational, and social currencies consumers exchange in a physical setting better provides an enhanced shopping experience. Consumers appreciate fairness, and those who feel that omnichannel retailers are equitable—that is, consistent and transparent—in their pricing are more likely to be loyal. It would be useful for retailers looking to deliver effective omnichannel strategies to understand research into the psychological drivers of consumer behavior, the facilitation of technology in ensuring transactional fairness, and the long-term consequences for customer loyalty and brand image.

Moreover, SET provides a framework for analyzing customer interaction with in-store phygital technologies balanced between hedonic and utilitarian dimensions. It thus allows insight into understanding how perceived value affects consumer satisfaction and loyalty, according to Ahmad et al. (2023), and it will describe how these technologies improve the shopping experience and strengthen brand loyalty. According to this viewpoint, SET highlights consumer expectations in social contexts and advances research into how such technologies satisfy needs and impact the shopping experience.

The theory focuses on factors influencing consumer acceptance of new in-store technologies, especially perceived usefulness, dependability, and ease of adopting the technology. It also examines the effects of personalization through these technologies on consumer behavior with a fair idea of reciprocity in an exchange.

Explainable AI, in addition to a SET-based recommendation system, will contribute to increasing in-store experiences by establishing user trust. Transparency in AI recommendations increase user confidence in the potential of having more meaningful phygital experiences. By making recommendations toward user preference, explainable AI provides the user with a more personalized experience, which aligns with the emphasis on reciprocity in exchanges proposed by SET.

Repeat business and brand advocacy will likely follow when customers' needs are satisfied. By emphasizing the advantages of products, explainable AI improves convenience and the shopping experience (Mökander & Schroeder, 2022). Social Exchange Theory states that any transaction must be fair. Explainable AI boosts customer satisfaction by offering objective advice (Ahmad et al., 2023). According to Cropanzano et al. (2015), AI systems progressively improve their recommendations based on user feedback, which highlight the need to consider ethics to avoid consumer biases and maintain a trustworthy shopping environment, especially when developing explainable AI.

The study of consumer behavior in physical retail—e.g., Halibas et al. (2023)—and omnichannel retailing—e.g., Asmare and Zewdie (2022)—offers some interesting avenues for applying SET in the work of Gonzalez and Ferrandi (2021). Reciprocal behavior is crucial to evaluate how explainability impacts customer satisfaction and trust. The inquiry on ethical implications of AI recommendations in retail will provide useful outputs to help merchants exploit explainable AI to improve phygital shopping experiences.

#### 4.2. Practical implications

The Social Exchange Theory increases the impacts of omnichannel retail because customers' experiences are influenced by the quality of the transactions. Chou and Hsu (2016) extend the idea of presenting the emotional and rational aspects of satisfaction and trust. It is appropriate for the different exciting experiences in phygital retail to show the value of a product and develop positive feelings. SET suggests that exchanges depend on perceived benefits and costs, so retailers can attract customers and encourage loyalty by offering tangible (like discounts) and intangible (such as exclusive experiences) incentives.

To improve interactions in physical retail through high-quality service—a strategy that improves both online and in-store shopping experiences—trust is essential, according to Social Exchange Theory. Phygital stores can draw consumers by using SET principles when advantages, such as convenience and time savings, exceed disadvantages by adopting mobile payments, self-checkout kiosks, and customized recommendations. The shopping experience is further enhanced by technologies like gamification, virtual reality, and interactive displays, which result in more satisfying transactions.

SET emphasizes the critical role of social interactions and relationships in the retail industry. These ideas can be applied in physical retail settings using linked technologies like social media and product reviews. Augmented reality fitting rooms and AI assistants improve personalization during shopping and produce memorable experiences. Marketers can develop technologies that satisfy consumer needs and ultimately lead to more fulfilling experiences by applying SET principles in a digital context.

#### 4.3. Further research and limitations

The study draws attention to Greece's fledgling physical retail industry's small market size and potential cultural biases. Generalizability may be limited by a sample that is biased toward early enthusiasts. The underrepresentation of Gen-Z and Baby Boomers may affect the results, even though there are no discernible physical differences between the generations. Future studies should concentrate on changing consumer preferences in physical settings, stressing demographic engagement and its impact on purchasing decisions, and using larger sample sizes for more accurate comparisons (Sharma & Dutta, 2023). Research should explore how AI, VR, and AR enhance cross-channel and in-store shopping, focusing on effective integration. Supply chain efficiency depends on giving timely delivery and customer satisfaction top priority. Effectively addressing omnichannel retail challenges requires strategic frameworks that match business models with physical strategies.

#### Conclusions

A positive linear relationship exists between consumer needs for in-store technologies and their experiences in phygital retailing, particularly in utilitarian, hedonic, and social aspects. A nonlinear positive relationship also exists between explainable AI and memorable phygital experiences. In physical retailing, hedonic factors also improve customer experiences and create memorable shopping moments. For the fourth goal, cross-channel integration and consumer experiences in physical retailing have a positive nonlinear relationship that improves distinctive shopping experiences. However, for the fifth objective, we find no moderating effects of gender or generation on the relationships between hedonic factors and consumer experiences or between cross-channel integration and consumer experiences.

SET standard targets phygital retail spaces in omnichannel marketing by illustrating the flow of transactions between buyers and sellers, since it aids in understanding and enhancing the customer experience. New SET applications can be developed by examining consumer behavior in these settings. Future research must focus on how consumer preferences and

attitudes change in physical environments to improve growth and profitability, retailers can evaluate the alignment of their phygital strategy with their business model.

## References

- Ahmad, R., Nawaz, M., Ishaq, M., Khan, M. & Ashraf, H. 2023. Social exchange theory: Systematic review and future directions. *Frontiers in Psychology*, 13, 1015921.
- Ameen, N., Tarhini, A., Shah, M. & Nusair, K. 2021. A cross cultural study of gender differences in omnichannel retailing contexts. *Journal of Retailing and Consumer Services*, 58, 102265.
- Asmare, A. & Zewdie, S. 2022. Omnichannel retailing strategy: a systematic review. *The International Review of Retail, Distribution and Consumer Research*, 32(1), 59-79.
- Banik, S. 2021. Exploring the involvement-patronage link in the phygital retail experiences. *Journal of Retailing and Consumer Services*, 63, 102739.
- Banik, S. & Gao, Y. 2023. Exploring the hedonic factors affecting consumer experiences in phygital retailing. *Journal of Retailing and Consumer Services*, 70, 103147
- Batat, W. 2022a. What does phygital really mean? A conceptual introduction to the phygital customer experience (PH-CX) framework. *Journal of Strategic Marketing*, 32(8), 1220–1243
- Batat, W. 2022b. Why is the traditional marketing mix dead? Towards the “experiential marketing mix” (7E), a strategic framework for business experience design in the phygital age. *Journal of Strategic Marketing*, 32(2), 101–113.
- Batat, W. 2019. *Experiential setting design*. Cham: Springer.
- Bilal, M., Zhang, Y., Cai, S., Akram, U. & Halibas, A. 2024. Artificial intelligence is the magic wand making customer-centric a reality! An investigation into the relationship between consumer purchase intention and consumer engagement through affective attachment. *Journal of Retailing and Consumer Services*, 77, 103674.
- Bonfanti, A., Vigolo, V., Vannucci, V. & Brunetti, F. 2023. Creating memorable shopping experiences to meet phygital customers' needs: evidence from sporting goods stores. *International Journal of Retail and Distribution Management*, 51(13), 81-100.
- Burnsed, K. & Bickle, M. 2015. Comparison of US generational cohort's shopping mall behaviors and desired features. *International Journal of Sales, Retailing and Marketing*, 4(6), 18-30.
- Chanda, R., & Islam, T. 2024. Baby boomers' Over-The-Top (OTT) rush-older customers on new platforms. *Cogent Business & Management*, 11(1), 2327131.
- Chou, S. W., & Hsu, C. S. 2016. Understanding online repurchase intention: social exchange theory and shopping habit. *Information Systems and e-Business Management*, 14, 19-45
- Cook, K., Emerson, R., Gillmore, M. & Yamagishi, T. 1983. The distribution of power in exchange networks: Theory and experimental results. *American Journal of Sociology*, 89(2), 275-305.
- Coppola, D. 2024. E-commerce as share of total retail sales worldwide 2021-2027 (February 28).. Retrieved from Statista: <https://www.statista.com/statistics/534123/e-commerce-share-ofretail-sales-worldwide/>
- Cropanzano, R., Anthony, E., Daniels, S. & Hall, A. 2015. Social exchange theory: A critical review with theoretical remedies. *Academy of Management Annals*, 11(1), 479–516.
- Doval, E., Viladrich, C., & Angulo-Brunet, A. 2023. Coefficient Alpha: The Resistance of a Classic. *Psicothema*, 35(1), 5-20.
- Emerson, R. 1976. Social exchange theory. *Annual Review of Sociology*, 2, 335-362.
- Gao, W., Fan, H., Li, W. & Wang, H. 2021. Crafting the customer experience in omnichannel contexts: The role of channel integration. *Journal of Business Research*, 126, 12–22.

- Gonzalez, C. & Ferrandi, J. 2021. Digitalization in the Service of Socially Responsible Consumption? Focus on Food Consumption. In Dekhili, S. (ed.), *Marketing for sustainable development* (pp. 239–259). Wiley, Hoboken.
- Huaman-Ramirez, R. & Merunka, D. 2019. Brand experience effects on brand attachment: the role of brand trust, age, and income. *European Business Review*, 31(5), 610-645.
- Jayasinghe, S., Johnson, L., Hewege, C. & Perera, C. 2022. Defining firm-level resource integration effectiveness from the perspective of service-dominant logic: A critical factor contributing to the sustainability of a firm's competitive advantage and the ecosystem it operates. *Sustainability*, 14(5), 2717.
- Joshi, A., Pani, A., Sahu, P., Majumdar, B. & Tavasszy, L. 2024. Gender and generational differences in omnichannel shopping travel decisions: What drives consumer choices to pick up in-store or ship direct?. *Research in Transportation Economics*, 103, 101403.
- Khan, I., Fatma, M., Shamim, A., Joshi, Y. & Rahman, Z. 2020a. Gender, loyalty card membership, age, and critical incident recovery: Do they moderate experience-loyalty relationship?. *International Journal of Hospitality Management*, 89, 102408.
- Khan, I., Hollebeek, L. D., Fatma, M., Islam, J. & Riivits-Arkonsuo, I. 2020b. Customer experience and commitment in retailing: does customer age matter?. *Journal of Retailing and Consumer Services*, 57, 102219.
- Kim, J-H., Kim, M., Yoo, J. & Park, M. 2021. Consumer decision-making in a retail store: the role of mental imagery and gender difference. *International Journal of Retail & Distribution Management*, 49(3), 421-445.
- Kshetri, N., Dwivedi, Y., Davenport, T. & Panteli, N. 2024. Generative artificial intelligence in marketing: Applications, opportunities, challenges, and research agenda. *International Journal of Information Management*, 75, 102716.
- Kumar, J., Rana, S., Rani, G. & Rani, V. 2024. How phygital customers' experience transforms the retail banking sector? Examining customer engagement and patronage intentions. *Competitiveness Review: An International Business Journal*, 34(1), 92-106.
- Halibas, A., Van Nguyen, A., Akbari, M., Akram, U. & Hoang, M. 2023. Developing trends in showrooming, webrooming, and omnichannel shopping behaviours: Performance analysis, conceptual mapping, and future directions. *Journal of Consumer Behaviour*, 22(5), 1237-1264.
- Lemon, K. & Verhoef, P. 2016. Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69-96.
- Lissitsa, S. & Kol, O. 2021. Four generational cohorts and hedonic m-shopping: association between personality traits and purchase intention. *Electronic Commerce Research*, 21(2), 545–570.
- Liang, J. & Xu, Y. 2018. Second-hand clothing consumption: A generational cohort analysis of the Chinese market. *International Journal of Consumer Studies*, 42(1), 120–130.
- Mele, C., Spina, T. R., Marzullo, M. & Di Bernardo, I. 2023. The phygital transformation: a systematic review and a research agenda. *Italian Journal of Marketing*, 3, 323 - 349.
- Mishra, S., Malhotra, G., Chatterjee, R. & Shukla, Y. 2023. Consumer retention through phygital experience in omnichannel retailing: Role of consumer empowerment and satisfaction. *Journal of Strategic Marketing*, 31(4), 749-766.
- Mökander, J. & Schroeder, R. 2022. AI and social theory. *AI and Society*, 37(4), 1337-1351.
- Mosquera, A., Olarte-Pascual, C., Juaneda Ayensa, E. & Sierra Murillo, Y. 2018. The role of technology in an omnichannel physical store: Assessing the moderating effect of gender. *Spanish Journal of Marketing-ESIC*, 22(1), 63-82.
- Natarajan, T., Veera Raghavan, D. & Jayapal, J. 2023. How does channel integration quality promote omnichannel customer citizenship behavior? The moderating role of the number

- of channels used and gender. *Kybernetes*, <https://doi.org/10.1108/K-11-2022-1594>
- Nguyen, H. 2021. Channel Integration Quality, Customer Experience and Patronage in Omnichannel Retailing. *Journal of Distribution Science*, 19(12), 23-32.
- Pandey, S. & Chawla, D. 2018. Online customer experience (OCE) in clothing e-retail: Exploring OCE dimensions and their impact on satisfaction and loyalty – Does gender matter? *International Journal of Retail & Distribution Management*, 46(3), 323-346.
- Pusceddu, G., Moi, L. & Cabiddu, F. 2023. Do they see eye to eye? Managing customer experience in phygital high-tech retail. *Management Decision*. <https://doi.org/10.1108/MD-05-2022-0673>
- Quach, S., Barari, M., Moudrý, D. & Quach, K. 2022. Service integration in omnichannel retailing and its impact on customer experience. *Journal of Retailing and Consumer Services*, 65, 102267.
- Quinones, M., Díaz-Martín, A. & Gómez-Suárez, M. 2023. Retail technologies that enhance the customer experience: a practitioner-centred approach. *Humanities and Social Sciences Communications*, 10(1), 1-8.
- Redmond M. 2015. *Social Exchange Theory*. English Technical Reports and White Papers, 5, Iowa State University.
- Sachdeva, I. & Goel, S. 2015. Retail store environment and customer experience: a paradigm. *Journal of Fashion Marketing and Management*, 19(3), 290-298
- Salviati, G., Ziliani, C., Teller, C., Ieva, M. & Ranfagni, S. 2022. Omnichannel retailing and post-pandemic recovery: building a research agenda. *International Journal of Retail & Distribution Management*, 50(8/9), 1156-1181.
- Schermelleh-Engel, K., Moosbrugger, H. & Müller, H. 2003. Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit Measures. *Methods of Psychological Research Online*, 8(2), 23–74.
- Sharma, N. & Dutta, N. 2023. Omnichannel retailing: exploring future research avenues in retail marketing and distribution management. *International Journal of Retail & Distribution Management*, 51(7), 894-919.
- Song, C. & Kim, Y. 2022. The role of the human-robot interaction in consumers' acceptance of humanoid retail service robots. *Journal of Business Research*, 146, 489–503.
- Stein, A. & Ramaseshan, B. 2020. The customer experience – loyalty link: moderating role of motivation orientation. *Journal of Service Management*, 31(1), 51-78.
- Taherdoost, H. 2019. What is the best response scale for survey and questionnaire design; review of different lengths of rating scale / attitude, scale / Likert scale. *International Journal of Academic Research in Management*, 8(1), 1-10.
- Tarka, P., Harnish, R. & Babaev, J. 2023. Hedonism, hedonistic shopping experiences and compulsive buying tendency: a demographics-based model approach. *Journal of Marketing Theory and Practice*, 31(2), 197-222.
- Wang, P., Li, K., Du, Q. & Wang, J. 2024. Customer experience in AI-enabled products: Scale development and validation. *Journal of Retailing and Consumer Services*, 76, 103578
- Yao, A., Chan, N. & Yao, N. 2024. Understanding consumer behavior in phygital environments: an interpretivist methodological framework. *Qualitative Market Research: An International Journal*, 27(3), 449-470.
- Yazdani, A. & Darbani, S. 2023. The impact of AI on trends, design, and consumer behavior. *AI and Tech in Behavioral and Social Sciences*, 1(4), 4-10.
- Zhang, X., Park, Y., Park, J. & Zhang, H. 2024. Demonstrating the influencing factors and outcomes of customer experience in omnichannel retail. *Journal of Retailing and Consumer Services*, 77, 103622.
- Zimmermann, R., Mora, D., Cirqueira, D., Helfert, M., Bezbradica, M., Werth, D., Weitzl, W.,

Riedl, R. & Auinger, A. 2023. Enhancing brick-and-mortar store shopping experience with an augmented reality shopping assistant application using personalized recommendations and explainable artificial intelligence. *Journal of Research in Interactive Marketing*, 17(2), 273-298.