The role of Virtual Reality on the Consumer Experience: a literature review

Auteur : Tahir, Stéphanie
Promoteur(s) : Dessart, Laurence
Faculté : HEC-Ecole de gestion de l'Université de Liège
Diplôme : Master en sciences de gestion, à finalité spécialisée en international strategic marketing
Année académique : 2024-2025
URI/URL : http://hdl.handle.net/2268.2/24387

THE ROLE OF VIRTUAL REALITY ON THE CUSTOMER EXPERIENCE: A LITERATURE REVIEW

Jury:
Supervisor:
Laurence DESSART
Reader(s):
Jordan Fleissig

Master thesis presented by
Stéphanie TAHIR
To obtain the degree of
MASTER IN MANAGEMENT
with a specialization in
International Strategic
Marketing.
Academic year 2024/2025

Ecole de Gestion de l'Université de Liège

1. Acknowledgements

I would first like to warmly thank Mrs. Dessart, my supervisor, for her guidance throughout this dissertation. Her kindness, availability, and constant encouragement have been a tremendous support. She has managed to guide me with rigor while still allowing the necessary space for intellectual independence, for which I am deeply grateful.

I also wish to thank Mr. Fleissig, who kindly agreed to review this dissertation. I am grateful for the time she will devote to this task, as well as for the critical attention and constructive feedback she will undoubtedly provide.

I would like to express my gratitude to HEC Liège for the quality of the education I have received over the years, for the many learning opportunities offered, and for the stimulating academic environment in which I was able to grow.

My heartfelt thanks also go to my family, for their unwavering support, patience, and trust. Their constant presence, both in times of doubt and in moments of success, has been a fundamental pillar throughout my journey.

Finally, I wish to extend a special thanks to my close friends, as well as to all those who, directly or indirectly, contributed to my journey. Their support, attentiveness, and presence have faithfully accompanied me throughout this academic adventure.

2. Table of Contents

3. Introduction

3.1. Preamble

"There is the 'real' world, but we do not perceive it directly. It is constructed by the nervous system and the sensory system of each animal, and assembled differently by each of them. What we perceive is a construction (…). This is the umwelt of the animal, its sensory environment: that portion of the world that its sensory organs and nervous system allow it to perceive. For the animal, only this portion of the world matters (…).

But what could be more illusory than the world we see? After all, in the darkness of our skulls, nothing ever reaches us. There is no light, no sound, nothing. The brain alone resides there, in a darkness as total as that of a cave, receiving only translations from the outside, provided by its sensory apparatus." [free translation] (Nayler, 2024, pp. 112, 192, 384)

According to sensory marketing, we perceive and interpret our environment through visual, haptic, auditory, gustatory, or olfactory signals (Miller & Stoica, 2004), which directly shape our perception, judgment, and behavior (Krishna, 2012). But what if a technology could simulate these senses, recreate their signals, and immerse our mind in a reality that does not physically exist? »

3.2. Conceptualization of VR and the consumer journey

You are at home, in your room, physically, at least. Yet what you perceive is something entirely different: a boutique, where you try on clothes, feel the texture of the fabric, examine every detail of a bag before deciding which one suits you best. A moment later, you are in Greece, standing before the Parthenon, as it is today, or as it stood two thousand years ago. You have not moved, and yet you are elsewhere, you feel yourself to be elsewhere. It seems unimaginable, and yet this is precisely what virtual reality (VR) makes possible: the ability to see with other eyes, eyes that can be anywhere and everywhere.

Virtual reality is defined as a three-dimensional computer-generated environment in which the user can navigate and interact, with real-time simulation of one or more of their senses (Hollebeek et al., 2020). It relies on two fundamental components: immersion and interactivity. Immersion refers to the system's ability to plunge the user into a virtual universe through sensory stimulations, while disconnecting them from their immediate physical environment (Mkedder et al., 2024). Interactivity, on the other hand, corresponds to the possibility offered to the user to dynamically modify the content of the virtual environment according to their actions or choices (Rafaeli, 1988).

This technology can range from highly immersive, when it relies on a head-mounted display immersing the user in an enveloping virtual universe, to weakly immersive, when it is limited to non-immersive devices such as a flat screen (Mills & Noyes, 1999). VR can therefore be perceived as a new form of experience in which the virtual space is apprehended as the real world and where what takes place within it is lived as though it were truly happening (Slater, 2009). It thereby induces in the user a sense of presence — the psychological sensation of being "physically" located in a non-physical space — to the point of forgetting the technological device itself (Aldossary & McLean, 2022; Slatter, 1999).

These new technological advancements have revolutionized individuals' routines, including consumption behavior (Raza et al., 2024). They profoundly transform the behavior of consumers, brands, and retailers (Grewal et al., 2017), and hold considerable potential across all stages of the customer journey (Farah et al., 2019).

Customer experience (CX) is defined as "the customer's cognitive, emotional, behavioral, sensorial, and social responses to a firm's offerings during the customer's entire purchase journey" (Lemon & Verhoef, 2016 ; as cited by Players & Poncin, 2020, p.1). It results from continuous interactions between the consumer and the provider, covering the pre-purchase, purchase, and post-purchase phases (Verhoef et al., 2009). It does not represent merely an affective or emotional state but rather the evaluations that emerge from the confrontation with specific stimuli (Brakus, Schmitt & Zarantonello, 2009). These exchanges, whether direct or indirect, create opportunities to engage the client, who plays an active role in co-producing the experience through their interactions with retailers, by multiplying contact points and offering them memorable experiences that create value (Prahalad & Ramaswamy, 2004).

Recent advances in VR technology now provide more realistic representations than ever before and make the technology increasingly accessible to the general public. Many brands already incorporate it into their campaigns, whether for the launch of a product or service, the promotion of an existing brand, or the creation of new experiences (Farah et al., 2019 ; McLean & Barhorst, 2022). VR applications are booming in marketing, with companies redesigning their websites to offer highly interactive and immersive experiences (Deng et al., 2019). This technology enriches core consumer experiences—such as product evaluation or store visits—and creates more valued experiences (Flavián et al., 2019). The growing investments in immersive technologies confirm experts' forecasts, which position VR as a major lever for retail transformation (Mkedder et al., 2024).

VR stores thus allow consumers to browse, interact with, and purchase products as if they were in a physical store (Mkedder et al., 2024). In fashion, virtual shows make it possible to attend exclusive events from home (Jung et al., 2021). In hospitality, the development of VR opens promising perspectives, with its unique capacity to create three-dimensional, interactive, and stimulus-rich environments that enable consumers to test services or explore spaces before the act of purchase (McLean & Barhorst, 2022).

Similarly, in the tourism sector, VR has become a widely adopted and effective marketing tool, enabling destinations, attractions, hotels, and tour operators to offer low-cost immersive experiences accessible from home (Skard et al., 2021). It also allows tourism marketers to deliver intangible tourist experiences through immersive sensory stimulations, with the potential to influence travelers' intentions to visit a destination (Alyahya & McLean, 2022).

3.3. Objectives and structure

All this has given rise to a new field of research aiming to define, understand, and classify these technologies, first individually, and then in terms of their use in contact with consumers. An increasing number of studies seek to capture this growing phenomenon, identify its potential applications, examine the advantages and obstacles to its adoption, and analyze the ways in which it is transforming our experiences, our daily lives, and society at large.

In this context, the present thesis aims to make a contribution to the existing literature by means of proposing an exhaustive systematic review of the works dedicated to the impact of virtual reality on the consumer experience. The present study is structured around four major research questions, which are linked in a complementary manner. Following the presentation of the methodology, the first question, which serves a scoping function, maps the studies according to the sectors, technologies, and theories involved. The second question, *"What are the factors driving to the virtuality?"*, builds on this foundation by exploring the appeal factors of VR from both consumer and provider perspectives. Building on this understanding of motivations, the third question, *"What role can virtual reality play at each stage of the consumer experience?"*, examines how VR concretely intervenes at each stage of the consumer journey by drawing on all the study results. Finally, based on the findings of the previous sections, the fourth question, *"Virtuality, complement or substitute for the real?"*, investigates whether VR complements the physical experience or, in certain cases, tends to replace it. The final discussion situates all the results in perspective and, by identifying the questions already addressed, highlights the persisting gaps, thereby opening up new avenues for research outlined in the conclusion of this thesis.

4. Methodology

The method chosen to synthesize and provide the most comprehensive overview of current research on the subject is a systematic literature review. This type of review is systematic in that the method used to survey and select the papers is explicit and reproducible. This has the added benefit of ensuring research rigour and minimising bias in identifying relevant literature (Xiao & Watson, 2019).

The present literature search and selection followed the systematic review guidelines suggested by Rowe (2014):

- *Step 1/ Selecting research questions;*

In order to avoid formulating an overly broad research question, this study narrowed its focus to the examination of Virtual Reality (VR) in relation to customer experience.

- *Step 2/ Determining the dataset sources;*

Articles were collected through the Scopus database, identified as one of the most comprehensive and reliable sources for this type of academic research (Yang et al., 2017).

- *Step 3/ Choosing the searching keywords;*

Following a preliminary exploration of the literature, a series of keywords related to the topic was identified and tested in order to retain those providing the most relevant results. The final query used in Scopus was:

TITLE-ABS-KEY (((virtual AND real*) OR vr) **AND** TITLE-ABS-KEY ((consumer AND experience) OR shop* OR retail*))

- *Step 4 – Using practical screening criteria such as language and publication year.*

Filters were applied directly in Scopus. The publication period was limited from 2018, taking into account the rapid evolution of technologies, up to and including 2024, in order to ensure reproducibility. Only articles belonging to the *Business, Management and Accounting* field, published in academic journals, written in English, and ranked at least “B” in the HEC Journal Guide were retained. Journals not related to marketing were also excluded.

- *Step 5 – Applying methodological screening criteria to filter the literature and ensure the adequacy and quality of the study, and analyzing results from articles.*

A two-stage inclusion/exclusion process was implemented. In the first stage, based on the reading of titles and abstracts, articles that did not specifically address VR and its impact on customers and their experience were excluded, as well as systematic literature reviews and articles presenting only a conceptual framework without empirical data collection. Studies that proposed a conceptual framework supported by empirical data, however, were retained. In the second stage, based on full-text reading, articles deemed irrelevant to the research questions were excluded. The precise reason for each exclusion was recorded in the Excel tracking file. Finally, certain articles considered relevant were included.

The initial keyword search identified 5,372 results. After applying filters in Scopus, 115 articles remained. Screening of titles and abstracts reduced this number to 54. Following full-text reading, 48 articles were retained, and the addition of 3 further articles considered relevant brought the final total to 51 articles included in the review.

- *Step 6 & Step 7 – Conducting a reliable and valid review to abstract main findings from articles, and synthesizing the results of the literature to interpret research findings.*

For each of the 51 articles retained, the information was systematically coded in a structured Excel file. This coding covered, on the one hand, the contextual elements: the main objective of the study, the sector examined, the technology employed with details on the technological support and format, the resulting environment, and the theoretical framework(s) used. On the other hand, the variables forming the models were identified, including the stimulus, the process variable, the dependent variable, and the moderators. Lastly, the main findings of each study were recorded.

The Excel file also contained columns corresponding to the three main research questions: (1) the attractiveness of VR, subdivided into consumer and retailer perspectives; (2) the consumer journey, with a dedicated column for each phase and for moderators; and (3) the role of VR as a complement to or substitute for the real experience. Articles addressing several research questions were coded in all relevant columns.

This initial structuring provided a comprehensive overview of the literature and facilitated the subsequent organization of results. During the writing process, the findings related to each question and each phase were reorganized thematically in order to provide a clear and detailed understanding of the mechanisms and effects of virtual reality.

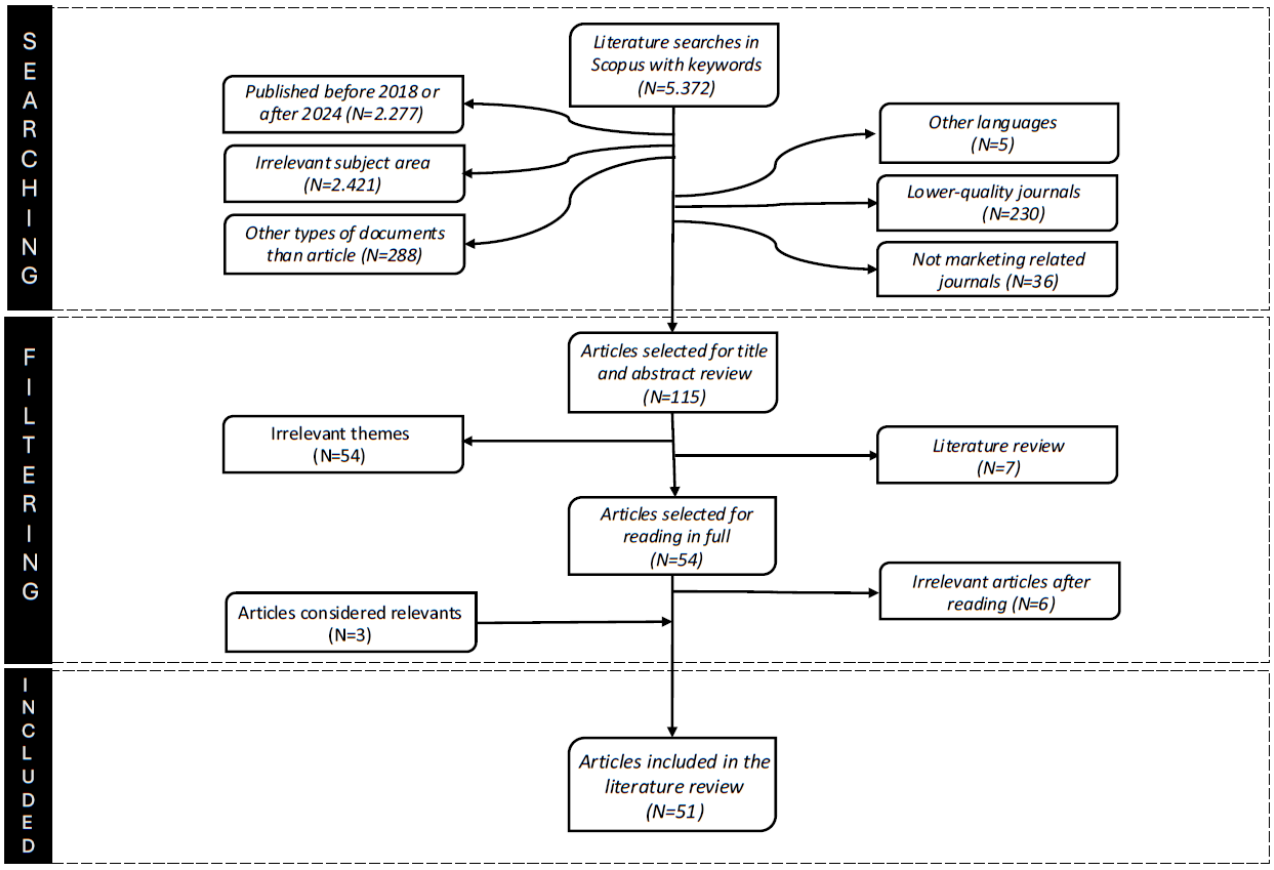
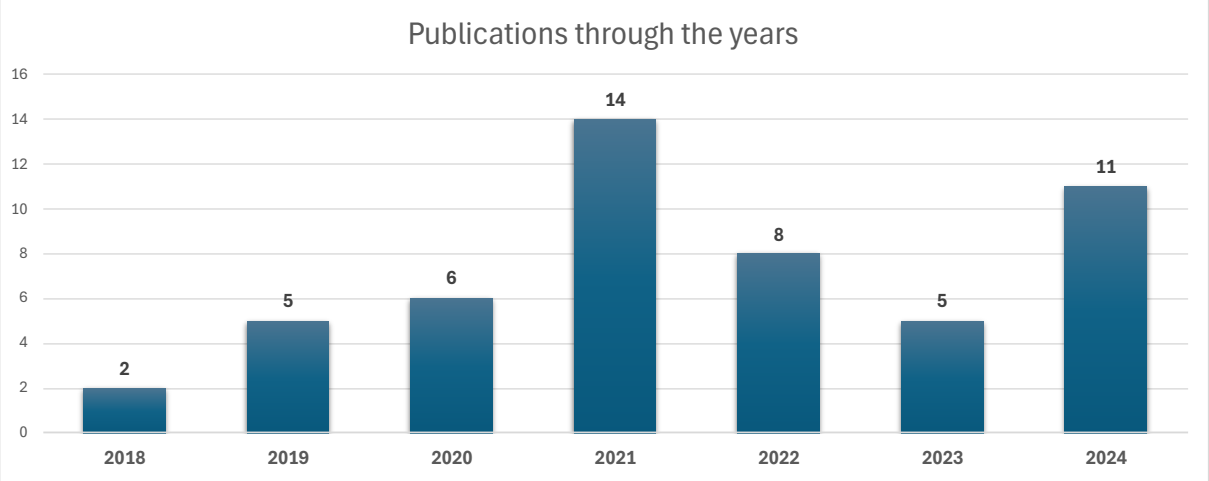


Figure 1, Selection process

5. Literature review

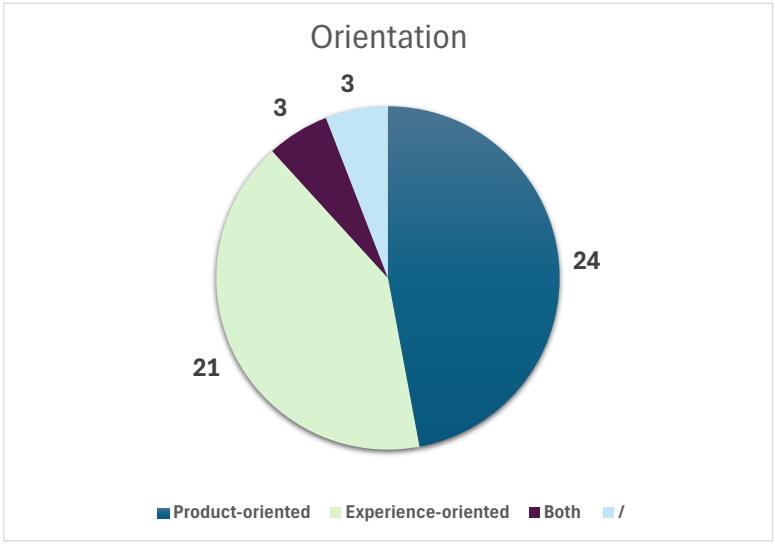
5.1. General overview of the selected corpus

5.1.1. Temporal distribution of publications

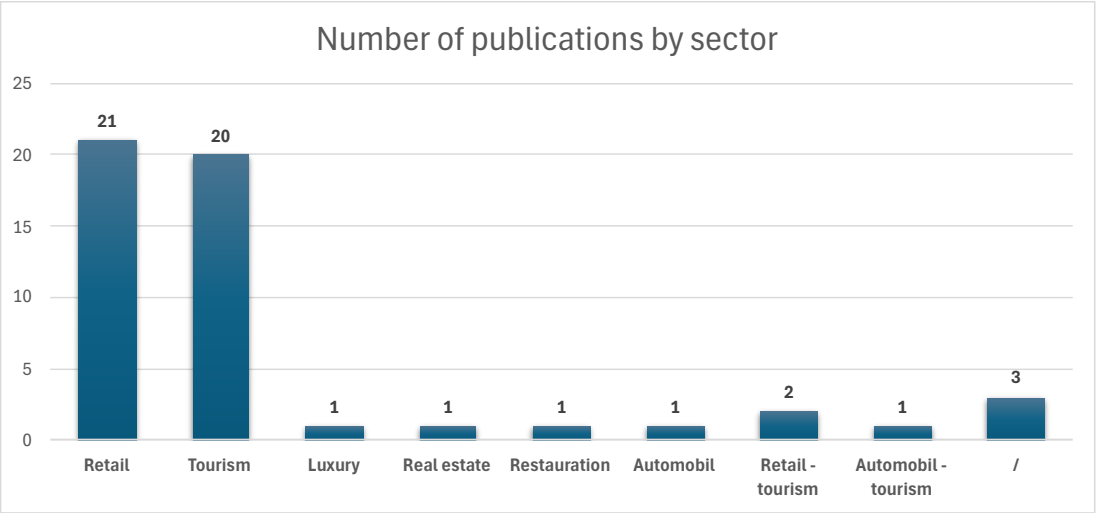


The publication trend has shown a marked progression since 2018. While the number of articles remained relatively modest in the initial years, it gradually increased to reach a peak in 2021 with fourteen publications. The subsequent years indicate sustained, though somewhat reduced, interest, with eight articles in 2022, five in 2023, and a renewed increase in 2024 (N = 11).

5.1.2. Orientation and studied sectors



When classified according to their dominant orientation, the studies reveal a relatively balanced distribution between those focusing primarily on products (N = 24) and those addressing the consumption of experiences (N = 21). Three studies enhance the generalizability of their findings by testing them across different contexts or by comparing them. The three studies without specific attribution correspond to more general investigations, whose results can be applied across all sectors.



Once subdivided by sector, retail emerges as the most represented domain, with twenty-one dedicated studies. It is followed closely by tourism and hospitality, examined in twenty articles. Other fields appear more sporadically, including luxury, real estate, the restaurant industry, and the automotive sector, each represented by a single study. Some research spans multiple domains, such as two articles combining retail and tourism, and one bridging automotive and tourism. Finally, three studies cannot be assigned to a specific sector, as they are exploratory or conceptual in nature.

5.1.3. Technologies and formats

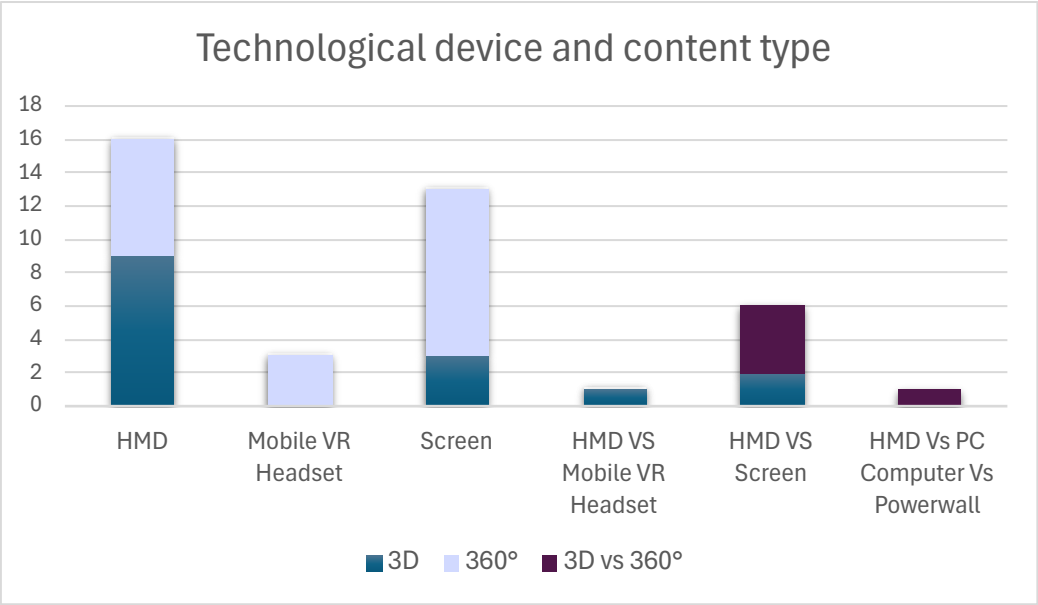
The classification of virtual reality devices adopted in this review draws on the expanding typology of Miessner et al. (2017) by Martínez-Navarro et al. (2019), which differentiates technologies according to their human–machine interface. Five main categories are retained:

(i) classic screens (PC monitors) ;
(ii) powerwalls, that is, ultra–high-definition giant screens ;
(iii) mobile headsets (mobile VR devices), such as the Samsung Gear VR ;
(iv) immersive headsets (HMDs), such as the Oculus Rift or the HTC Vive ;
(v) immersive cubes (CAVE systems).

Within this classification, the category initially labelled “PC monitors,” here renamed “Screen,” encompasses all flat-panel display devices, including computers, tablets, and smartphones.

In addition, the experimental content is structured around two principal immersive formats : 360°, which relies on realistic images or panoramic videos, and 3D, which is based on digitally generated three-dimensional environments (Martínez-Navarro et al., 2019). Some studies directly compare these two formats within an experimental design (3D versus 360°).

Technological support / Content type	3D	360°	3D vs 360°	
HMD	9	7	0	**16**
Mobile VR Headset	0	3	0	**3**
Screen	3	10	0	**13**
HMD VS Mobile VR Headset	1	0	0	**1**
HMD VS Screen	2	0	4	**6**
HMD Vs PC Computer Vs Powerwall	0	0	1	**1**
	15	**20**	**5**	



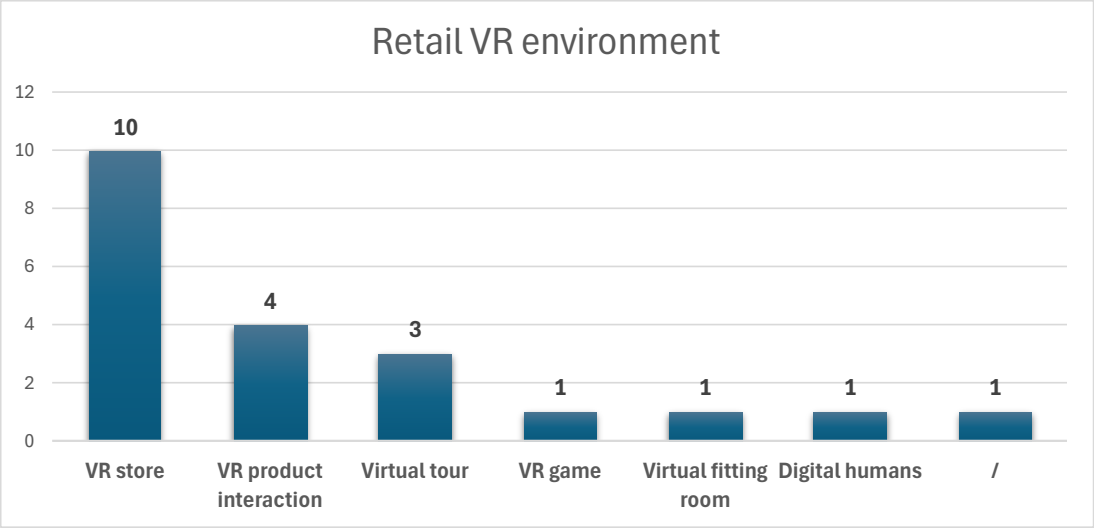
The analysis of the forty identified configurations highlights a predominance of immersive technologies. Head-Mounted Displays (HMDs) are the most frequently employed (N = 16), followed by screens (N = 13) and mobile headsets (N = 3). Eight studies adopt a comparative design, contrasting for instance HMDs with screens (N = 6), HMDs with mobile headsets (N = 1), or HMDs with both PC and powerwall (N = 1).

Regarding formats, twenty studies rely on 360°, fifteen involve 3D environments, and five compare the two. More specifically:

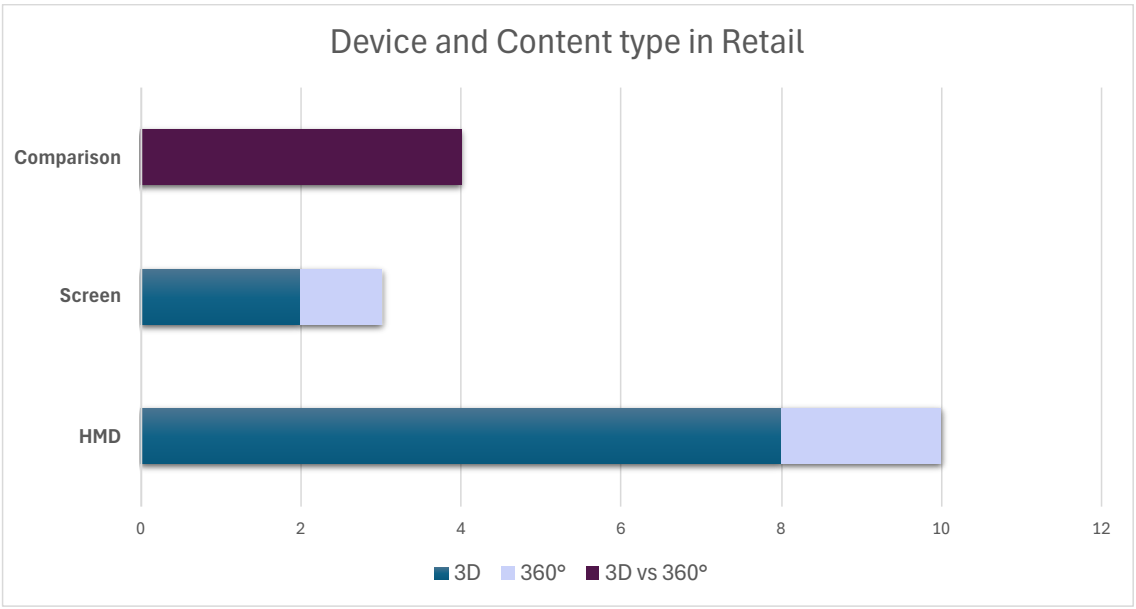
- HMDs are used in nine studies employing 3D environments and in seven relying on 360°,
- Screens (PC, tablet, or smartphone) are used in ten 360° studies and three 3D studies ;
- Mobile VR headsets are employed exclusively in 360°,
- Comparisons between 3D and 360° are mostly found in studies contrasting HMDs and screens.

Finally, eleven articles do not specify the technologies used or do not involve any. These are predominantly conceptual or qualitative investigations, exploring consumer perceptions or intentions based on prior experiences with virtual reality, often through retrospective questionnaires without controlled exposure to a VR device.

5.1.4. Virtual environments in retail studies



In the retail sector, the most frequently examined environments are VR stores, appearing in ten studies. These are followed by product interaction devices (N = 4), which, although potentially integrated within VR shops, are here restricted to isolated interactions such as product presentations or virtual shelves. Virtual tours constitute the next category (N = 3), while more specific configurations, such as VR games, virtual fitting rooms, and the inclusion of digital humans, are each represented by a single study.

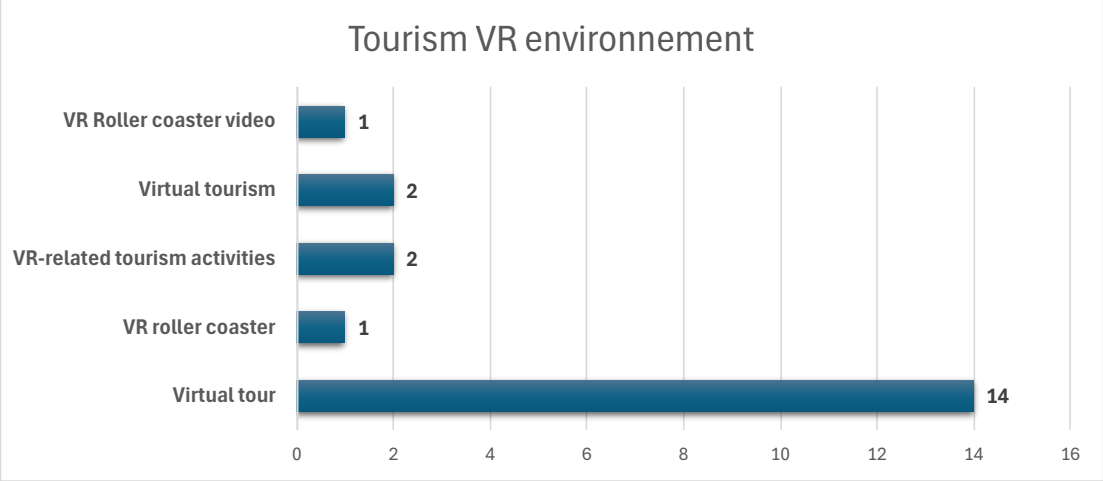


Most of these virtual shopping environments are developed with immersive HMD technologies and presented in a 3D format. Configurations using the 360° format or screens mainly occur within comparative designs contrasting different levels of immersivity (high versus low). Only one virtual store was presented exclusively through a screen.

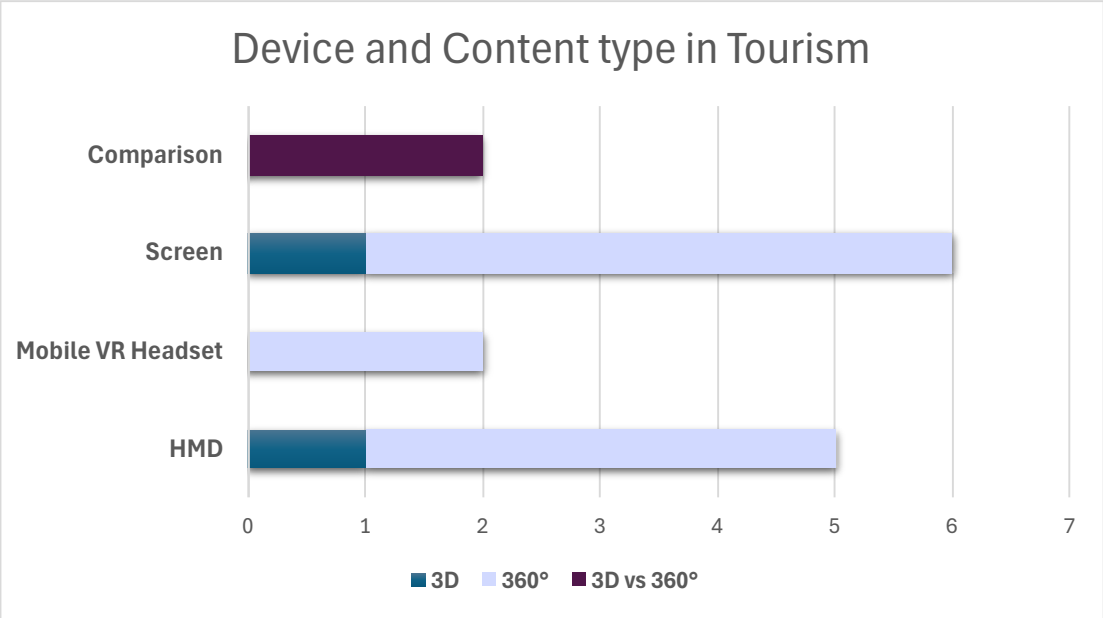
Product interaction devices are likewise created in 3D and tested either through HMDs or in comparison with a screen (PC). Virtual tours, by contrast, are consistently delivered in a 360° format, whether experienced via an HMD (N = 2) or a screen (N = 1). The VR game provides a 3D experience through an HMD, whereas the virtual fitting room is hosted on a website, presented in 3D via a screen.

Overall, the distribution of technologies employed in retail studies underscores the predominance of HMDs, with the majority of environments designed in 3D format, sometimes supplemented by 360° in comparative settings. Screens appear more sporadically, most often within comparative studies.

5.1.5. Virtual environments in tourism studies



In the tourism sector, the environments examined are predominantly virtual tours, identified in fourteen studies. These are followed by forms such as virtual tourism (N = 2), VR-based tourism activities (N = 2), VR roller coaster experiences (N = 1), and a roller coaster video projected in virtual reality (N = 1). Overall, these environments are primarily designed to simulate or reproduce existing tourist sites or activities from a distance.



At the technological level, the studies rely more on low-immersive devices. Six are conducted via screens, seven through headsets (HMDs or mobile headsets), and two adopt a comparative approach. The format employed is in almost all cases 360°, consistent with the visual and exploratory orientation of the environments under study.

Several studies do not specify the technology or format used. These include research on virtual tourism, wine tourism, or tourism activities linked to VR. In such cases, the approach is conceptual or exploratory, aiming to capture perceptions and intentions of potential users without direct exposure to a VR experience. Other studies collect data through retrospective questionnaires administered to individuals who have already participated in this type of experience.

Overall, the distribution highlights a strong predominance of the 360° format and a greater reliance on non-immersive technologies.

5.1.6. Virtual environments in other sectors

Beyond the retail and tourism sectors, a few studies are situated in more occasionally represented domains. In the luxury sector, one study explores a virtual reality fashion show delivered in 360° format through an HMD. In real estate, a study examines a virtual tour in 360° accessible via screen, while the restaurant sector is also represented by a virtual tour in 360° on screen. The automotive field appears through a study describing a VR marketing campaign designed in 360° and projected on screen.

Two studies cut across multiple sectors. One links retail and tourism, analyzing a marketing campaign presented in 360° through a mobile VR headset and comparing two technologies and formats (HMD versus screen). The other bridges automotive and tourism by means of a 360° virtual tour presented on screen.

5.1.7. Theoretical frameworks

After outlining the application contexts and the technologies employed, this section turns to an overview of the main theoretical frameworks adopted in the selected studies. This makes it possible to identify the conceptual foundations underpinning the analysis of consumer experience within virtual environments.

Theories	Explanation	Article(s)
Big five personality trait	The Big Five Personality Traits model identifies five fundamental dimensions of human personality: extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. In the context of online behavior and immersive environments, these traits influence how individuals react to technologies and interact with brands.	(4)
Cognitive emotion theory	It states that emotions arise from the cognitive evaluation of a stimulus, meaning that it is the interpretation of a situation that triggers the emotional response, which then influences behavioral intentions.	(11)
Consumer learning theory	The consumer learning theory describes changes in memory and behavior that result from information processing. It is expressed through three dimensions: cognitive, affective, and conative.	(6), (12)

Theories	Explanation	Article(s)
Cue-utilization theory	It posits that consumers evaluate products based on cues present and collected in the environment, which they use as quality signals to guide their choices.	(29)
Elaboration Likelihood Model (ELM)	The ELM is a dual-route persuasion model: the central route, activated by high involvement, implies deep information processing, while the peripheral route, linked to low involvement, relies on simple cues. The level of engagement thus determines how attitudes are formed.	(16)
Embodied cognition	The embodied cognition theory posits that thought and judgments are rooted in sensory perceptions and bodily states, unconsciously influencing individuals' decisions and behaviors.	(2), (10)
EPI Cube	The EPI Cube developed by Dix (2017) is a three-dimensional model used to classify technologies according to their level of embodiment, presence, and interactivity in the context of human-technology interactions.	(8)
Flow theory	Flow is an optimal state of engagement in which the user is completely absorbed in the virtual activity, experiencing pleasure, losing track of time, and acting fluidly, thanks to a balance between their skills and the challenges encountered.	(35), (44), (46)
Human Computer Interaction (HCI)	It analyzes how individuals perceive, manipulate, and react to technological interfaces, taking into account cognitive and sensory dimensions. In VR, it highlights the impact of device characteristics on states such as immersion, presence, or embodied cognition.	(27)
Information System (IS) Success Model	The IS Success Model posits that system and information quality determine usage and user satisfaction, which in turn influence individual and organizational outcomes.	(24)
McAlister's Framework of Consumer Choice Dynamics	It models consumer choice behavior across three dimensions: state dependence related to the influence of past choices, heterogeneity of individual preferences, and the non-stationarity of the marketing environment.	(43)
Means-End Chain Theory	It describes consumer decision-making as a hierarchical process structured across three levels: product attributes, perceived consequences of its use, and personal values pursued. It posits that purchase intentions arise from evaluating the benefits a product can bring in relation to the consumer's core values.	(7)

Theories	Explanation	Article(s)
Mental imagery	Mental imagery is a cognitive process in which the consumer consciously generates mental images, based on external or internal stimuli, allowing them to anticipate, relive, or simulate a consumption experience.	(9), (28), (30), (37), (48), (49)
Ontological properties of the digital virtual	The ontological properties of the virtual define it as an imagined, yet real, reality that transcends materiality and enables forms of consumption beyond materiality, situated between the real and the ideal. Digital virtual consumption is thus seen as a material actualization of the virtual.	(22)
Operational transparency framework	This framework shows that making a company's efforts or internal processes visible (e.g., production, personalization) improves trust, satisfaction, and customer engagement, by giving them a better understanding and appreciation of the service.	(42)
Presence Emotion Intention (PEI) theory	The PEI Theory explains how the sense of presence in a virtual environment influences the user's emotions, which subsequently determine their behavioral intentions.	(14)
Presence theory	Presence represents the psychological feeling of being "physically" present in a non-physical space, to the point of forgetting the technology and interacting as if one were physically there.	(20), (25), (32), (34), (50)
Process theory	Process theory aims to explain how and why a phenomenon evolves over time, by identifying the underlying mechanisms and sequences of events that determine its emergence.	(25)
Role theory	Role theory describes how individuals adapt their behavior based on perceived roles, relying on social cues present in the environment, including in virtual reality through the non-verbal behavior of avatars.	(5)
Socioemotional selectivity theory	The socioemotional selectivity theory suggests that when individuals perceive time as limited, they prioritize emotional content to regulate their affective state.	(13)
Stimulus-Organism-Response framework	The SOR Framework models the impact of environmental stimuli, particularly from virtual environments, on the individual's internal reactions (affective, cognitive), which subsequently determine their behaviors.	(11), (13), (17), (18), (26), (36), (38), (39)
Technology Acceptance Model (TAM)	A model explaining technology acceptance by users according to their perception of its benefits, such as usefulness, ease of use, and hedonic dimensions like playfulness.	(26), (40), (44)

Theories	Explanation	Article(s)
Theory of phygital customer experience	The phygital theory posits a seamless integration between physical and digital worlds to create immersive, continuous, and coherent experiences throughout the consumer journey, centered around the individual.	(19)
ERTs framework	The ERTs framework, proposed by Batat & Hammedi (2023), classifies technologies according to their ability to recreate in virtual reality the different dimensions of the customer experience, contributing to the construction of a sensory, social, and behavioral phygital continuum.	(19)
Theory of Planned Behavior (TPB)	It posits that the intention to adopt a behavior results from three factors: attitude toward the behavior, subjective norms (perceived social pressure), and perceived behavioral control, i.e., the anticipated ease or difficulty of performing the behavior.	(26)
Theory of Reasoned Action (TRA)	It describes a three-step process: attitude, intention, behavior, in which an individual's intention mediates between their attitude toward a behavior and the actual performance of that behavior.	(48)
Unified Theory of Acceptance and Use of Technology (UTAUT)	The UTAUT model by Venkatesh et al. (2003), derived from TAM, explains technology adoption intention based on expected performance, perceived ease of use, social influence, and facilitating conditions.	(40)
Vicarious satiation	Vicarious satiation refers to a psychological process of satiety experienced without direct consumption, induced by overexposure to others' experiences or by immersive environments such as virtual reality, where excessive stimulation reduces perceived benefits.	(47), (51)
Vicarious touch	Vicarious touch refers to the sensation of touch experienced vicariously, when an individual observes a tactile interaction (e.g., via a video or immersive simulation) without direct physical contact. Such an experience can elicit sensory and emotional reactions comparable to direct touch.	(41)
Vividness	Vividness refers to the ability of a medium to produce a sensorially rich environment, stimulating multiple senses with intensity and clarity, thereby fostering consumer imagination, understanding, and involvement.	(45)

5.2. The appeal of Virtual Reality

5.2.1. Appeal for consumers

Etymologically, the term “virtual” originates from the Latin *virtus*, which refers to courage, moral strength, and power (). In Roman thought, only virtue had the capacity to transform reality (Plantard, 1999 ; Quéau, 1996 ; as cited by Trabelsi-Zoghlami & Touzani, 2019, P.1614). In this perspective, transforming reality entails a constant pursuit of self-improvement, stimulating imagination and opening new perspectives for a better world. The virtual therefore represents a process of transcendence, pushing beyond existing boundaries. At its core, virtualization is anchored in the notion of a “detachment from the here and now” (Trabelsi-Zoghlami & Touzani, 2019).

Virtual reality expresses this capacity for transcendence by combining the assets of the physical and digital worlds in an unprecedented manner. From the comfort of their homes, consumers can explore places, examine products, or interact with services without the need to move. In real estate, it enables remote visits to multiple properties, saving both time and money (Pleyers & Poncin, 2020). In retail, it allows consumers to browse products regardless of location (Farah et al., 2019). In the wine sector, it grants access to virtual environments where one can discover an estate, interact with producers, and gather information in ways considered equivalent to a real experience, while overcoming spatial and budgetary constraints (Gastaldello et al., 2024).

Yet beyond this convenience, these technologies offer something more profound: the reintegration of sensory and behavioral dimensions typically reserved for physical experiences. Virtual reality thus moves beyond a simple online interface to establish a mode of immersion that reengages the consumer’s body within the purchasing environment.

Reintegration of the senses and the body into the virtual experience

Virtual reality reintroduces vision into the shopping experience in its entirety, offering a far richer visual exploration than that provided by traditional digital interfaces. Through conventional devices such as computer screens, and even more so with HMD technologies, users can observe the environment in 360°, turning in every direction and interacting with objects in a way that closely replicates real-world exploration (van Berlo et al., 2021). This capacity extends both to spaces, such as tourist destinations, restaurants, hotels, or retail outlets, and to products themselves, which can be rotated, grouped, and examined from every angle (van Berlo et al., 2021).

Some platforms go further by providing virtual fitting environments. Virtual fitting rooms enable consumers to visualize themselves wearing a garment or accessory (Yang et al., 2023). Although this feature is sometimes perceived as more playful than functional, particularly in the case of clothing, where the rendering of shapes and colors remains approximate, it nonetheless facilitates product evaluation. It proves especially relevant for larger items such as bags or cars, where virtual trials substantially support decision-making (Batat, 2024; Yang et al., 2023).

From interaction to embodiment: finding the body in digital space

The interaction afforded by VR differs radically from the usage logics of traditional websites. Clicking on a link and waiting for information to appear on a screen does not correspond to the natural physical behaviors of humans (Deng et al., 2019). In contrast, virtual reality enables direct motor engagement. Through controllers and tracking, users can grasp, rotate, and bring products closer in order to examine them from every angle. Such realistic interactions replicate behaviors observed in physical retail

environments and facilitate product learning (van Berlo et al., 2021). Personalized navigation and user control over the content displayed also support an individualized approach, difficult to achieve with other formats, even dynamic ones such as video (Spielmann & Mantonakis, 2018).

These mechanisms directly enhance the sense of immersion, with equivalent technology (HMD), an interactive experience in which users can move freely within the environment generates a significantly higher level of immersion than a passive VR experience, such as simply watching a video (Anaya-Sánchez et al., 2024). The decisive factor is therefore not only visual but also behavioral. This conclusion is reinforced by studies that identify body-oriented dimensions as one of the principal drivers of user experience in VR (Anaya-Sánchez et al., 2024).

In this way, users regain mastery over their experience, as this restored control, combined with multisensory correlations, fosters a heightened sense of embodiment, understood as the degree of integration between the technology and the human body (de Regt, 2021; Flavián et al., 2019a).

Simulated and haptic touch

Beyond movement, more refined forms of interaction further reinforce the embodied experience. In physical stores, the ability to touch products makes it possible to assess characteristics such as texture, temperature, or weight. While this capacity is absent from traditional web interfaces, it is partially re-created within VR environments.

Immersive devices enable users to interact with objects through simulated actions such as grasping, moving, or positioning, using joysticks or controllers. These virtual touch capabilities not only enrich the consumer experience but also influence how products are perceived and valued. Alzayat and Lee (2021) demonstrate that, compared to a website experience, virtual reality reduces the *Need for Touch* of an instrumental nature, focused on evaluating haptic properties such as weight, temperature, or texture. Conversely, it enhances the *Need for Touch* of an autotelic nature, associated with the sheer pleasure of handling an object for amusement.

This illusion of touch can even be triggered by credible haptic cues alone, such as the visualization of texture, which strengthens the impression of having physically touched the product (Cowan et al., 2023).

The most striking effect, however, occurs when a virtual hand is integrated into the experience. Users do not merely see it; they perceive it as part of their own body. This phenomenon of *body ownership* is coupled with an even subtler mechanism: when the virtual hand touches a product, consumers develop a sense of ownership over it, which significantly enhances its perceived value. This mechanism, known as the *vicarious haptic effect*, arises in the complete absence of real physical contact (Luangrath et al., 2022).

Other multisensory senses and effects

Beyond sight and touch, additional sensory modalities contribute to enriching the immersive experience. Unlike traditional websites, which remain limited to static images and text, VR environments can incorporate diverse multimedia elements such as videos, sounds, images, or embedded text (McLean & Barhorst, 2022). This sensory richness enhances not only *presence* but also the quality of *mental imagery*, giving users the illusion of truly living the experience (Alyahya & McLean, 2022).

Olfaction can also be mobilized in VR environments. Alongside technological devices such as olfactory masks (e.g., OVR Technology), textual descriptions alone may suffice to evoke olfactory mental sensations. The mere presence of an olfactory cue increases immersion, transforming a visually immersive experience into a sensorially immersive one (Cowan et al., 2023).

Auditory stimuli play an equally fundamental role. The addition of ambient sounds, sound effects, or music heightens the sensation of *presence* and enriches the consumption experience (Pizzi et al., 2020). Music, in particular, modulates emotional states: a fast rhythm stimulates excitement and intensifies pleasure, while softer music fosters relaxation and strengthens *presence*, encouraging consumers to prolong their navigation (Loureiro et al., 2021). More broadly, VR experiences that integrate auditory content are perceived as more engaging and typically lead to longer exposure times (Alyahya & McLean, 2022).

The influence of these multisensory stimuli does not remain confined to the virtual environment but extends to real-world perception. This perceptual transfer is grounded in the principles of *embodied cognition*, which emphasize the interdependence of cognition and sensory perception. Mental processes are shaped by bodily experiences to the extent that physical sensations, even unconscious ones, influence individual judgments, emotions, and behaviors (Krishna et al., 2017). Thus, VR experiences shape subsequent sensory perceptions, even in physical contexts. Wen and Leung (2021) illustrate this phenomenon, showing that sensory experiences lived upstream in VR influence the way consumers later perceive the same stimuli in real environments.

Extended Reality Technologies: Towards a real reproduction of the senses

While sensory cues in VR aim to *evoke* physical sensations through visual or auditory stimuli, Extended Reality Technologies (ERTs) go further: their purpose is to *reproduce* physical sensations within virtual environments. Although such devices have not yet been fully integrated into VR experiences, several exploratory studies have presented or tested them with consumers to assess their potential for use in immersive commercial contexts.

The study conducted by Batat (2024) highlights a strong enthusiasm for the replication of touch and sight, identified as the most relevant and desirable sensory dimensions in phygital experiences. Consumers express clear expectations for technologies that would enable them to touch products virtually, assess their texture, shape, and quality, and generate emotions through this sensory interaction. Touch thus emerges as a central vector of immersion and emotional connection, with two primary motivations: the search for authenticity and the pursuit of entertainment. However, these reactions stem from demonstrations or videos rather than real testing, which limits their empirical scope.

With respect to sound, reactions appear more ambivalent. The presentation of 3D sound technologies elicited in some participants a heightened sense of immersion, accompanied by intense emotions such as surprise or even increased heart rate. Sound is therefore perceived as a powerful channel of integration between physical and virtual spheres, enhancing immersion and reinforcing connection with the brand universe. Yet other participants reported sensory discomfort, linked to the perceived proximity of sounds, the invasion of personal space, or confusion between real and virtual. Experiences of confusion, paranoia, and even phobia were also mentioned.

Olfaction provokes similarly contrasting responses. While considered relevant, particularly in relation to perfumes, food, flowers, or other scented products, it is also a source of apprehension. Consumers expressed concerns about the effects of poorly calibrated or inappropriate odors, fearing sensory

overload or emotional rejection. In the absence of effective testing, the experiential validity of virtual smell therefore remains uncertain.

Taste, by contrast, was largely rejected. The idea of simulating flavors through devices placed in contact with the tongue raised concerns about hygiene. Its relevance was also questioned, as gustatory pleasure is closely tied to authentic social and physical experiences that cannot be replicated virtually.

In sum, these technologies broaden the horizon of possibilities but also elicit highly differentiated responses depending on the sense involved. While sight and touch clearly emerge as priorities, sound and smell divide opinions, and taste is excluded altogether. ERTs thus delineate a new sensory frontier, the adoption of which will depend not only on technological advances but equally on user acceptance.

Reintegration of the social dimension

Finally, VR makes it possible to restore a sense of social presence, even in the absence of real interactions. Through narrative interaction and transportation, users experience the feeling of sharing the environment with the characters present, even when these are inanimate (de Regt et al., 2021).

Some platforms go further by reintroducing social interaction through digital humans. The study by Silva and Bonetti (2021) demonstrates that individuals are willing to engage with these digital entities, which are perceived as credible in roles such as brand ambassadors or personal advisors. Although results reveal no consensus, these figures generate a significantly stronger propensity for interaction than indifference, with gender emerging as a moderator: men display greater willingness to engage. While variations appear across regions, no significant differences are observed in relation to age, professional status, income, or type of device owned.

In terms of interaction modalities, users express a desire to communicate by voice, text, or gestures, although voice interaction is the most favored, while gestures elicit comparatively less enthusiasm. Regarding preferred media, the smartphone ranks first, followed by the VR headset, with preferences closely linked to users' sociodemographic and technological characteristics (Silva & Bonetti, 2021).

A widening of the field of possibilities

Virtual reality does not merely transpose the codes of physical commerce into digital space. Rather, it abolishes the constraints imposed by the tangible environment, liberating the user experience from spatial, temporal, material, and even social limitations that govern the real world. It thereby enables the design of new experiential scenarios that could only be realized within a virtual universe.

Bin Kim and Jung Choo (2023) distinguish three forms of commercial environments in virtual reality. The first is a straightforward transposition of physical stores into digital space. The second consists of dematerialized shops, which follow the logics of real commerce but exist solely in virtual environments. The third corresponds to "fantasy-based" stores, made possible only in a virtual world, for instance, shops located in a desert or beneath the ocean.

This capacity to stage inaccessible universes gives VR a distinctive added value when it offers experiences that could not be provided in the physical world. In a focus group conducted by de Regt et al. (2021), several participants reported acquiring the most valuable knowledge precisely when virtual content delivered a brand experience they could never have encountered in reality.

The ability to dissolve the boundaries of possibility extends equally to social and symbolic barriers. VR technologies democratize access to events or experiences traditionally reserved for an elite in the physical world, removing the logics of exclusivity. Within these hierarchically unconstrained

environments, users experience a genuine sense of empowerment, with one participant describing the sensation of having control over everything, even over reality itself (Jung et al., 2021).

Tourism provides a particularly illustrative case of VR's ability to transcend the limits of the real. Beyond offering consumers something completely new, namely the opportunity to try out a destination (Tussyadiah et al., 2018), it also offers the possibility of entirely novel experiences lived exclusively through virtuality. Virtual tourism makes it possible to explore inaccessible, humanly unfeasible, or impossible places, free from spatial or temporal restrictions (Petr & Caudan, 2024).

This potential is further illustrated by Li M. et al. (2024) through the example of visiting collections or heritage sites. By offering experiences perceived as authentic, VR provides access to cultural treasures otherwise made inaccessible for preservation purposes.

In this sense, virtual reality does more than broaden the horizons of consumer experience: it redefines the very ways in which individuals can engage with places, objects, and universes previously beyond reach.

5.2.2. Appeal for providers

A strategic lever for brands and retailers

With its immersive and transformative potential, offering customers a virtual reality experience is far more than a technological add-on, it is a strategic investment whose benefits extend well beyond the promoted product. By enriching consumer experiences, VR triggers a series of positive behavioral effects that directly enhance the marketing performance of brands and retailers.

Immersive environments foster stronger purchase intentions, increase online engagement, and reinforce attitudes toward both products and destinations (Cowan et al., 2023; Martínez-Navarro et al., 2019). These effects, however, are not confined to the focal object, the overall image of the retailer or brand also benefits from the immersive experience. Deploying VR improves attitudes toward the brand itself, beyond perceptions of the product alone (Pleyers & Poncin, 2020).

At the same time, technology conveys an aura of modernity. Brands adopting VR are perceived as innovative and forward-looking, which can attract greater store traffic by making the customer journey more engaging. Conversely, retailers failing to adopt these practices risk losing market share to bolder competitors (Farah et al., 2019).

The impact of VR also extends to the relationship consumers develop with the brand. VR campaigns stimulate *narrative transportation*, which strengthens emotional engagement and even consumers' willingness to advocate for the brand (de Regt et al., 2021). Brand recall is likewise enhanced (Martínez-Navarro et al., 2019).

This relationship can be further cultivated in gamified contexts. When a product or brand is integrated into a VR game, it benefits from implicit and experience-embedded evaluations that prove highly effective. The positive emotions elicited through play are then transferred to the brand, increasing its perceived value (van Berlo et al., 2021).

Even in more traditional formats, such as 360° virtual tours, the consumer experience remains non-intrusive and personalized, as users themselves determine their level of interaction, deciding, for instance, how long to spend on the visit or how many hot points to explore. Such experiences heighten the feeling of *telepresence*, while the integrated offers are perceived as more authentic and less

manipulative, thereby fostering greater consumer openness. Notably, this effect holds regardless of the technological device used or the emotional state of the consumer (Spielmann & Orth, 2021).

Research

In addition to its transformative potential, the faculty of reproduction also positions VR as a powerful research tool. Several studies show that consumer behaviors and attitudes in VR environments are comparable to those observed in physical reality. Product evaluations conducted in VR are consistent with those carried out in real contexts, which lends strong ecological validity to the medium (Branca et al., 2023). This behavioral continuity is largely explained by the sense of *presence* that VR creates: when users feel present in the virtual environment, they act, interact, and react spontaneously as they would in real life, with transfers between real and virtual occurring unconsciously (Martínez-Navarro et al., 2019).

VR thus establishes itself as a rigorous and sustainable testing environment, particularly suited to evaluating sensory stimuli or intangible attributes, while requiring fewer resources than traditional methods (Branca et al., 2023). It also enables the design of naturalistic settings for in-store research, allowing researchers to obtain accurate behavioral data and test various shopping scenarios without the need for a physical retail space, thanks to systems such as motion tracking or teleportation, considered equivalent (Schnack, Wright & Holdershaw, 2021).

From a training perspective, VR also proves to be an effective educational tool. It enables the simulation of realistic situations in a secure environment, facilitating the acquisition of key skills such as public speaking or customer interaction management. This makes it a cost-effective solution for large-scale training, particularly in contexts involving direct service encounters (Etienne et al., 2023). As for moderating factors in such trainings, the type of headset used does not affect participants' confidence levels; however, high-end devices do enhance the sense of presence and perceived realism, even if the level of artificiality remains unchanged. With respect to avatars, their appearance (cartoon-like versus photorealistic) does not alter valence or arousal, but photorealistic avatars foster greater user trust (Etienne et al., 2023).

This immersive and sensory capacity of virtuality, by reactivating the senses, reinstating the body, and restoring interactions, combined with its potential to transcend the boundaries of reality, paves the way for a profound transformation of the consumer experience. These dimensions extend beyond mere initial seduction, reshaping the entire journey. It therefore becomes necessary to examine how these characteristics are concretely expressed at each stage, through their various applications and the effects they generate.

5.3. Consumer Journey

5.3.1. Pre-purchase

The consumer journey begins with the pre-purchase phase, which starts with the recognition of a need, followed by its consideration and the search for information (Lemon & Verhoef, 2016 ; as cited by McLean & Barhorst, 2022). At this stage, the decision-making process is initiated, often long and deliberate, beginning with the identification of a need to be satisfied and continuing with a research phase aimed at identifying the most relevant alternatives (Farah et al., 2019).

Within the scope of this systematic review, the pre-purchase phase occupies a central place, accounting for 41 of the 51 studies analyzed. The contexts examined are mainly divided between virtual tourist destinations and shops (N = 20), but also include virtual marketing campaigns (N = 3) and a branded VR game (N = 1) enabling interaction with the brand and/or the virtual exploration of a place. Additional studies investigate virtual product interactions (N = 5), avatar-based experiences (N = 1), and VR store environments (N = 10).

For analytical clarity, this initial phase of the consumer journey will be structured into two main categories, reflecting two distinct approaches to the experience:

- Virtual experiences designed to encourage consumers, after prior immersion, to physically visit the location or discover the real offering;
- Experiences allowing the act of purchase to be fully enacted within the virtual universe, through an immersive reproduction of the physical experience.

Virtual experimentation as a trigger

This first configuration refers to situations in which virtual reality enables consumers to experience an environment or an offering prior to the real experience, thereby acting as a trigger toward the physical world. Studies conducted in this context have validated a series of behavioral effects. Most notably, the majority report a significant reinforcement of visit intention in both tourism and retail settings (N = 12). This effect may also be accompanied by increased interest in the location or store (N = 1) or a greater likelihood of approaching the offer (N = 1).

Several studies further confirm an increase in purchase intention following immersive exposure (N = 7). Immersive environments can also stimulate impulse buying intention (N = 1) and willingness to pay, notably through an enhanced perception of product value (N = 1). Other results include improvements in attitudes toward the brand (N = 4), the environment, or the advertisement (N = 2). Immersive experiences can also strengthen affective brand engagement, even to the point of fostering intentions of brand advocacy (N = 1). Finally, some studies highlight intentions to recommend the destination or store (N = 2), as well as intentions to reuse the technology, VR stickiness, driven by perceived subjective well-being (N = 1).

It is worth noting that effects such as positive word-of-mouth and brand advocacy are traditionally associated with the post-purchase or loyalty phase. Yet here, they emerge already in the pre-purchase stage. The studies validate these results within virtual experiments integrated upstream, before the completion of the actual purchase act.

In continuity with these findings, the following section turns to the mechanisms of virtual environments identified by the studies, which explain the achievement of such results. To ensure a structured and coherent reading, and without interrupting the continuity of the observed processes, the studies are grouped thematically, each theme reflecting as comprehensively as possible the underlying reasoning. Secondary results relevant to other themes may be recalled, but without full redeployment.

The selected themes are:

(i) *Presence* (or *telepresence*): the central pillar of the immersive experience;
(ii) Immersive architecture: devices and structural components;
(iii) Sensory stimuli and embodiment in immersive environments;
(iv) Perceived authenticity in virtual reality environments;
(v) Mental imagery and consumer learning;
(vi) Affective and experiential responses;

(+) A final section addressing the moderators of these processes identified in the literature.

An exception to this thematic distribution is made for the notion of *presence*, considered a major transversal construct within the VR experience. The first sub-section is therefore devoted to this concept which, without reviewing all studies that mention it, synthesizes the forms of presence examined, their antecedents, and the associated behavioral effects.

(Tele) presence: Central pillar of the immersive experience

To begin unpacking the mechanisms underlying the observed effects, it is necessary to examine some of the fundamental constructs of the immersive experience. Among them, *presence* is central. It is defined as "a psychological state in which the user's sensation is transported to a place quite different from the real physical environment, while they feel as though they are in a real environment" (Schultze, 2010 ; as cited by Li S. et al., 2024, p. 3). Presence stands out both for its prevalence in the literature, appearing in 17 of the 25 studies included here, and for its role as either a stimulus or a mediating lever in the influence exerted by virtual reality on the consumer.

In tourism contexts, several works have sought to explore its structure and effects. Anaya-Sánchez et al. (2024) identify *physical presence* and *self-presence*, the sensation that one's own body is located within the environment, as the most decisive dimensions. In contrast, *social presence*, understood as the degree to which other beings, whether real or synthetic, are perceived as present in the virtual environment, exerts a more limited influence. Tussyadiah et al. (2018) extend this perspective by demonstrating that presence emerges from *self-location*, the sense of being situated in the virtual environment as an integral part of it rather than merely perceiving a virtual self, and from the possibilities for action afforded by the immersive nature of the device.

This sense of presence reinforces the lived experience, which in turn improves the image of the destination and strengthens visit intention (Anaya-Sánchez et al., 2024). Post-VR changes in attitude may also arise, either directly through the influence of presence or indirectly through enhanced enjoyment (Tussyadiah et al., 2018).

Given its pivotal role, a summary table is provided to synthesize the antecedents and consequences of (tele)presence identified across the literature.

Immersive architecture: devices and structural components

Having examined (tele)presence as the central pillar of the immersive experience, it is now necessary to turn to the technical and structural levers that make its emergence possible. This section adopts a perspective focused on the internal characteristics of immersive devices, in order to understand how the very architecture of virtual environments is conceived and how it shapes user reactions.

Technical qualities and media richness

The construction of an immersive experience relies on a set of technical characteristics embedded in the design of the virtual environment. Lee et al. (2020) identify three key dimensions: *content quality*, *system quality*, and *vividness*. *Content quality* refers to the intrinsic value of the information provided in VR, assessed according to its accuracy, completeness, and the relevance of its presentation format (Nelson et al., 2005). *System quality* concerns the technical reliability, response speed, accessibility, and operational flexibility of the device. *Vividness* describes the representational richness of a mediated environment, that is, the extent to which it delivers information to the senses (Steuer, 1992).

These three components directly influence both attitudes toward VR and the sense of *presence*, which in turn act as mediators shaping behavioral visitation intentions. With respect to *presence*, *content quality* emerges as the most decisive factor, followed by *system quality* and then *vividness*. By contrast, when considering attitudes toward VR, this hierarchy is reversed, with *vividness* taking precedence (Lee et al., 2020).

Vividness can also reinforce *presence* when combined with *effectiveness*, understood as the degree to which virtual systems are able to support and enrich the user experience, thereby constituting a functional attribute (Li M. et al., 2024).

Finally, still with this same effect, Martínez-Molés et al. (2022) introduce the notion of *media richness*, defined as the capacity of a technology to create a rich sensory environment through its formal characteristics, in other words, the manner in which the environment presents information to the senses (Klein, 2003 ; Steuer, 1992). Although the terminology differs, this definition largely overlaps with that of *vividness*, underscoring their conceptual convergence and reaffirming the central role of this dimension in the construction of an immersive experience.

Perceived interactivity and perception of usefulness

While *vividness* plays an important role, Spielmann and Mantonakis (2018) show that it can be perceived in similar ways within a virtual tour and in a simple video. The decisive factor here is *interactivity*, defined as the user's ability to modify content in real time (Rafaeli, 1988) and to alter the visual–spatial perspective of information (Lurie & Mason, 2007).

Recognized as a central dimension of immersive devices, high perceived interactivity strengthens *presence* and generates more positive attitudes toward the advertising object (Martínez-Molés et al., 2022; Spielmann & Mantonakis, 2018). It thus operates as a lever for both cognitive and experiential engagement. Li S. et al. (2024) further demonstrate that, when paired with emotional stimulation through an empathic text, interactivity jointly influences immersion and perceived usefulness. Together, these two variables foster an *interactive pleasure* that directly contributes to purchase impulsiveness.

Interactive narrativity and participatory engagement

Interactivity paves the way for a shift from a storytelling mode, where the user remains a spectator, to a story-doing mode, where they become a full participant in the narrative. This shift is amplified when multisensory correlations foster a sense of *embodiment* in the scenario, thereby generating *narrative interaction*. Such narrative interaction promotes both *narrative transportation* and *social presence*, which in turn intensify *affective brand engagement* and stimulate intentions of brand advocacy (de Regt et al., 2021).

Modulation of the experiment by exposure duration

The intensity of perceived benefits, however, varies according to the duration of exposure to VR. Shorter sessions tend to enhance *stickiness* (intentions of reuse) and subjective well-being, with effects mediated by perceived usefulness and perceived benefits rather than by pleasure or ease of use.

Conversely, certain physiological factors, operationalized here as overexposure to the VR experience, can diminish the benefits derived by the consumer. In such cases, users report marked differences in the perceived outcomes, reflecting the negative impact of excessive consumption of immersive content (Pala et al., 2022).

Sensory stimuli and embodiments in immersive environments

Beyond structural and interactive dimensions, the immersive experience is nourished by sensory and bodily components. The integration of such stimuli represents a natural extension of its architecture, lending body and texture to the virtual environment. This section examines how the intensity, richness, and very nature of these stimulations shape the consumer and their experience.

Sensory intensity and immersive perception

Immersive environments are characterized by a variety of sensory channels : visual, auditory, tactile, olfactory, and even textual, whose intensity influences the overall experience, leading the user toward a state of sensory immersion (Alyahya & McLean, 2022).

Alyahya and McLean (2022) analyze the impact of different levels of sensory richness in VR experiences by comparing three conditions: low, medium, and high sensory levels. Their study shows that the addition of textual elements to visual and tactile components elevates the experience from a low- to a medium-sensory level, while the integration of auditory stimuli enables the transition to a high-sensory level. These enhancements produce significant effects across several variables. Both the quantity and quality of *mental imagery* are higher under medium- and high-sensory conditions compared to low ones, with text contributing to clearer mental imaging. Results also indicate that the influence of *presence* on attitudes toward the destination and on visit intention is significantly stronger under high-sensory conditions, whereas differences between lower levels remain negligible.

Complementarily, the use of real visual content, as opposed to digitally generated material, fosters greater ease of imagination and stronger visual appeal through an increased sense of *telepresence*, which in turn enhances booking intentions (Orús et al., 2021). These effects can be explained by the nature of perceived realism. *Perceived realism* refers to the extent to which the environment appears plausible or similar to observable reality (Atkin, 1983 ; McGloin, Farrar, and Kremar, 2011 ; as cited by Orús et al., 2021, p.3), while *factual realism* concerns the evaluation of whether the content is genuinely real or fabricated. In intangible industries, perceptions of factual realism play a critical role, the more faithfully the content is judged to reflect reality, the higher the sense of *presence* and the stronger the intention to book (Orús et al., 2021).

Still within the construction of destination image, Anaya-Sánchez et al. (2024) identify sensory and body-oriented dimensions as the principal contributors to the formation of lived VR experiences. Such experiences subsequently enhance destination image, which in turn positively influences visit intention.

This dynamic extends to olfactory stimuli. The integration of scents, whether physically emitted or merely described, heightens immersion. This intensified sensory immersion activates a state of *flow*, characterized by feelings of freedom, joy, accomplishment, and mastery, during which the perception of time tends to fade (Cowan et al., 2023; Spielmann & Mantonakis, 2018). This state fosters stronger online engagement, purchase intentions, and favorable brand responses. However, these effects dissipate once the VR experience is interrupted, underscoring that their impact operates primarily through immersion (Cowan et al., 2023). More broadly, visiting a VR store generates a higher state of *flow* than browsing a traditional website, thereby increasing brand interest and intention to visit the physical store (Kim G. et al., 2022).

Delayed sensory influence

Wen and Leung (2021), drawing on the theory of *embodied cognition*, demonstrate that the *presence* experienced in an immersive environment can modulate the sensory perception of a real product during subsequent interaction.

In their wine-tasting study, all participants sampled the same product. However, those who had previously engaged in a virtual meal evaluation through an HMD assessed the taste and finish differently from those exposed to a traditional video, while their perception of aroma and appearance remained unchanged. This phenomenon, referred to as *offline embodiment*, illustrates the capacity of a VR experience to shape subsequent physical perception, thereby enhancing the perceived value of the product and, in turn, increasing both purchase intention and willingness to pay.

The perceived Authenticcity in VR environments

Once the environment has been constructed and the sensory dimensions reactivated, the intensity of the experience inevitably raises a central question: are these virtual environments ultimately perceived by users as authentic?

Dimensions and effects

Four studies have examined the role of authenticity in tourism contexts, including museums, destinations, and hotel environments.

In immersive settings, authenticity refers to an experience in which the boundary between copy and original tends to dissolve. It is described as a subjective perception of naturalness, exceptionality, originality, truth, and uniqueness (Kim M. J. et al., 2020).

In the museum context, three specific forms of authenticity have been identified (Li M. et al., 2024). *Original authenticity* is grounded in the perceived veracity of objects. *Interactive authenticity* refers to the quality of interactions between visitors and exhibitions, often supported by technological devices that stimulate engagement and reinforce the impression of authenticity. Finally, *emotional authenticity* arises from the emotional resonance of a collection, nourished by history, culture, and the personal memories it conveys (Jin et al., 2020 ; Kesgin et al., 2021 ; Rickly, 2022 ; as cited by Li M. et al., 2024, p.3). These dimensions follow a hierarchical order: original authenticity shapes interactive authenticity, and together they contribute to emotional authenticity. However, only original and emotional authenticity exert a direct influence on visitation intention (Li M. et al., 2024).

Authenticity has been conceptualized as a response elicited by the immersive exhibition (Kim M. J. et al., 2020), developing through *presence* (Li M. et al., 2024; Spielmann & Orth, 2021). Yet, some findings suggest an inverse dynamic (McLean & Barhorst, 2022). In certain cases, authenticity emerges after presence and serves as a relay toward learning and visitation intention (Li M. et al., 2024; Spielmann & Orth, 2021). In others, it precedes presence and amplifies its intensity (McLean & Barhorst, 2022).

Authenticity generates both cognitive responses, such as deeper mental processing, and affective responses, including enjoyment, emotional involvement, and flow (Kim M. J. et al., 2020). These responses foster attachment to VR, itself associated with stronger visitation intentions. While affective responses are more closely linked to authenticity, it is ultimately the cognitive dimension that most strongly predicts final intention (Kim M. J. et al., 2020).

Finally, a 360° virtual visit, unlike a static image, enhances the perception of authenticity, understood here as the evaluation of the environment or product as real and sincere (Potter, 2010). This perception reduces feelings of advertising manipulation and makes consumers more inclined to approach the offer (Spielmann & Orth, 2021).

From similarity to satiation

While strong authenticity can stimulate interest, an excessively high perceived similarity between VR and physical reality may instead generate a satiation effect. The desire to experience the real often stems from the existence of a gap to be bridged between the two universes. However, when VR partially or fully satisfies the underlying experiential need, whether cognitive or affective, the physical location may lose its attractiveness, leading to a decrease in visitation intention (Deng et al., 2019). In such cases, less immersive media, such as static websites, can paradoxically elicit a stronger intention to visit. Participants nonetheless retain a favorable attitude toward the destination and remain willing to recommend it (Deng et al., 2019).

Mental imagery and consumer learning

Building on the previously described sensory and bodily dynamics, and once these environments have been constructed and experienced, this section turns to a more cognitive yet essential dimension of the pre-purchase phase: *mental imagery*. This represents one of the most striking effects of virtual reality on consumers, particularly due to its capacity to facilitate learning.

Triggers of mental imagery

Learning in immersive environments has been examined primarily through the lens of *mental imagery* (n = 5). The contexts investigated include tourist destinations (Alyahya & McLean, 2022; Skard et al., 2021), the hotel sector (McLean & Barhorst, 2022), restaurants (Hilken et al., 2022), as well as product-oriented settings (Cowan et al., 2021).

By definition, *mental imagery* refers to the perceptual or sensory representation of objects, ideas, or relationships in working memory. It can be triggered externally by stimuli such as advertising, but also internally through consumers' past experiences, thereby allowing them either to relive previous situations or to anticipate new ones (Zhang et al., 2024).

Several conditions favor its activation. Compared to static images, VR formats generate mental representations that are more vivid and engaging (Hilken et al., 2022; McLean & Barhorst, 2022; Skard et al., 2021). The perceived sensory intensity of the virtual environment also contributes to the clarity of the imagery produced. Alyahya and McLean (2022) demonstrate that richer sensory conditions, including textual elements, facilitate more effective cognitive processing and enhance the quality of mental imagery.

One of the most frequently studied antecedents is the feeling of *presence* (Cowan et al., 2021; Orús et al., 2021; Skard et al., 2021). However, some studies suggest the reverse relationship. *Mental imagery* can also precede and reinforce perceived *presence* through its quantity, the cognitive processing it engages, and its quality (Alyahya & McLean, 2022; McLean & Barhorst, 2022). This points to a bidirectional dynamic between the two constructs.

Effects on behavioural attitudes and intentions

What *mental imagery* indirectly enables, through the mediation of *presence*, is consumer learning (Martínez-Molés et al., 2022), leading to a strengthened intention to visit (McLean & Barhorst, 2022).

In parallel with this learning effect, *mental imagery* also enhances attitudes toward the brand (Cowan et al., 2021; Hilken et al., 2022) and toward the destination, which represents a central lever for visit intention (Alyahya & McLean, 2022) or purchase intention (Cowan et al., 2021; Hilken et al., 2022). Alyahya and McLean (2022) demonstrate this attitudinal change by measuring responses before and after the experiment. VR improves pre-existing attitudes, whereas a traditional website fails to generate such an effect.

Nevertheless, the activation of intention is not merely tied to the consumer's ability to visualize themselves in the experience, but rather to the *predicted happiness* associated with it (Skard et al., 2021).

Finally, VR appears more effective at foregrounding the *context* rather than the product, producing smoother mental imagery when it emphasizes the experiential environment. A contextual orientation allowing greater influence on brand attitude than on purchase intention (Hilken et al., 2022).

Affective responses and experiential variables

To this cognitive construction are added the emotional reactions that accompany and enrich the immersive experience, offering a more comprehensive understanding of its effects. Although relatively few studies focus exclusively on affective responses in immersive environments, emotional, hedonic, and experiential dimensions permeate most research. Their role, often mediated or indirect, emerges as a transversal framework underpinning the dynamics studied. This section illustrates their contribution by grouping together the results already presented in relation to them.

A particularly illustrative case highlights the centrality of affective responses by integrating them into the core of its model: the study of a branded VR game in which participants reported stronger emotional responses, measured in terms of *arousal* and *valence*, than those playing a non-branded version of the game. *Arousal* reflects the degree of neural activation during an emotional response, while *valence* corresponds to the extent to which this response is perceived as positive or negative (van Berlo et al., 2021). While HMD technology intensifies emotional reactions toward the content, the brand itself triggers a distinct emotion exceeding that induced by the game. This affective response, in turn, shapes both brand attitude and purchase intention (van Berlo et al., 2021).

Beyond this representative case, other findings confirm the supporting role of affective variables within mediated or indirect dynamics. Experiential attributes such as control, heightened enjoyment, or participation influence behavioral outcomes (Li M. et al., 2024). *Flow*, triggered by immersion, mediates the effect on purchase intention (Cowan et al., 2023). *Predicted happiness* explains the impact of *mental imagery* on visit intention (Skard et al., 2021). *The enjoyment* induced by presence modifies post-VR attitudes, which in turn affect visitation intention (Tussyadiah et al., 2018). In real estate, perceived playfulness during an immersive visit improves attitudes toward the service provider even

more strongly than toward the product itself (Pleyers & Poncin, 2020). Finally, affective brand engagement generated through narrative interaction fosters brand advocacy (de Regt et al., 2021).

On the other hand, several studies demonstrate that affective responses alone are insufficient to shape behavioral intentions. Textual empathy enhances perceived usefulness but does not increase immersion, nor does it directly influence impulse buying intention (Li S. et al., 2024). Enjoyment improves brand attitude but has no effect on product knowledge or purchase intention (Martínez-Molés et al., 2022). Arousal, despite being intensely stimulated, predicts only recommendation intentions without impacting visitation intention (Di Dalmazi et al., 2024). Authentic experiences elicit more affective than cognitive responses, yet it is the cognitive dimension that primarily drives visitation intention (Kim M. J. et al., 2020). Similarly, while VR generates stronger emotional appeal for hedonic products, this does not translate into higher purchase intention compared to an app interface (Mishra et al., 2021).

Moderating factors of the effects of virtual reality

The cognitive, affective, and sensory mechanisms described thus far do not unfold in an experiential vacuum. Their intensity and scope are modulated by a range of factors. These variables, referred to as *moderators*, do not directly determine the immersive experience itself but rather condition the magnitude or direction of its observed effects. The literature identifies moderators that can be grouped into three main categories: (i) technological parameters of the device, (ii) individual variables specific to the consumer, and (iii) contextual characteristics of the offer presented.

Technological parameters of the device

Several studies emphasize that even a weakly immersive device can generate notable effects. A 360° video viewed on a computer is sufficient to induce a sense of *presence* (Li M. et al., 2024) and significantly influence consumer experience and responses (Pleyers & Poncin, 2020). The medium alone, although immersive, has only a limited explanatory role in the emergence of *presence* (Di Dalmazi et al., 2024).

Nevertheless, other findings indicate that the intensity of effects varies with the degree of immersivity. When an experience is viewed through an HMD rather than a smartphone, levels of psychological *presence*, ease of imagination, and visual appeal are higher, though without significantly altering booking intentions (Orús et al., 2021). Highly immersive environments also amplify the effect of certain stimuli, such as olfactory cues. Their impact is enhanced when combined with immersive VR, yet in their absence, no difference is observed in terms of the immersiveness of the medium (Cowan et al., 2023).

McLean and Barhorst (2022) contribute to this dynamic by comparing three formats, static image, 360° tour, and HMD. Their results show that VR via HMD further stimulates perceived authenticity and cognitive processing linked to *mental imagery*, though not its quality.

Interactivity also constitutes a key parameter shaping perceived immersivity. In the study by Anaya-Sánchez et al. (2024), two 360° videos of a city were compared through HMD, one allowed users free movement, while the other followed a predefined path. The first was validated as high-immersive, the second as low-immersive. Although no significant differences were found in the measured final outcomes, the low-interactivity condition generated more VR sickness, which disrupted user presence and experience.

Individual variables of consumers

Consumer-specific characteristics modulate the effects produced by virtual reality, influencing the intensity of cognitive, affective, or conative reactions to immersive experiences. Several individual variables have been identified in the literature as moderators.

Gender first emerges as a differentiating factor. In the cruise context, findings indicate that women report higher levels of media richness, telepresence, enjoyment, product knowledge, and brand attitude compared to men. However, perceived interactivity and purchase intention show no variation. Women thus appear to achieve a sense of presence more easily, requiring less interactivity to reach it (Martínez-Molés et al., 2022).

Age also plays a moderating role. Di Dalmazi et al. (2024) reveal differences between Millennials and Gen Z, for Millennials perceived arousal significantly influences visit intention, whereas for Gen Z, the emotional dimension of the experience exerts a weaker impact and can even produce negative effects.

Technology readiness, defined as an individual's propensity to adopt new technologies (Li M. et al., 2024), further moderates outcomes. High technology readiness diminishes the influence of functional attributes, enjoyment, and participation on the sense of presence (Li M. et al., 2024).

Another relevant trait is enduring involvement, a stable disposition reflecting an individual's daily interest or enthusiasm for a product or product category. When enduring involvement is high, consumers are less likely to perceive strong similarity between virtual and physical environments, thereby reducing certain satiation effects linked to VR (Deng et al., 2019).

A particularly well-studied group of moderators relates to prior knowledge. This takes different forms depending on the context: familiarity with museums (Li M. et al., 2024), familiarity with a destination (Anaya-Sánchez et al., 2024; Skard et al., 2021; Tussyadiah et al., 2018), encompassing previous visits as well as knowledge gained through various sources (Horng et al., 2012) or product knowledge in sectors such as wine or automobile (Cowan et al., 2021; Wen & Leung, 2021).

To begin with, museum familiarity reduces the influence of several attributes, such as control, vividness, and participation on presence, with the sole exception of enjoyment, which remains unaffected (Li M. et al., 2024). In the tourism context, however, findings regarding training and visit intention appear more contrasted. Some studies report no significant effect of destination familiarity on the intention to visit (Anaya-Sánchez et al., 2024), while others indicate that individuals with high knowledge of a destination display weaker visit intentions when exposed to VR compared to 2D images (Skard et al., 2021). Complementing these results, Tussyadiah et al. (2018) show that the effectiveness of VR is preserved, albeit at a reduced level, when the experience involves revisiting a place, and whether the destination is local or distant.

With regard to products, a high level of prior knowledge can distort mental imagery and, in turn, degrade both attitude towards the brand and subsequent purchase intentions. However, this negative effect can be mitigated, or even neutralized, through the integration of haptic cues (Cowan et al., 2021). The study conducted by Wen and Leung (2021) provides the only example of a positive outcome. Wine connoisseurs evaluated the aroma and taste more favorably after a virtual vineyard tour than after viewing a traditional video. Nevertheless, this enhanced appreciation did not translate into higher purchase intentions or willingness to pay.

Finally, another finding highlights the role of interactive comparison, namely the transition from a traditional non-VR tourism e-commerce interface to a VR-based one. In such cases, the immersive experience does not generate a positive progression of behavioral responses throughout navigation. Cognition, emotion, and intention remain largely shaped by the first impression, preventing VR from overturning initial representations formed within the non-immersive environment (Li S. et al., 2024).

Contextual features

The literature also highlights the moderating influence of contextual characteristics, particularly the nature of the product and the level of cognitive load. Mishra et al. (2021) show that the effectiveness of VR depends on product type. For hedonic offers, it enhances visual appeal, emotional appeal, and purchase intention, whereas for utilitarian products, only the first two effects are observed. The study further notes that immersive environments are perceived as more effective when there is congruence between the characteristics of the interface and those of the product.

The context of use equally shapes the experience. Employing VR within a physical store, rather than online, reduces the state of flow and creates cognitive competition between real decision-making and immersive stimuli. This competition increases mental effort, thereby degrading the attitude toward the offer, although without altering purchase intention (Cowan et al., 2021).

Finally, the impact of a virtual visit on attitudes appears stronger than that of an online video under conditions of low cognitive load, but this relationship reverses when cognitive load becomes high (Spielmann & Mantonakis, 2018).

Crossing the Threshold : Living the Shopping Path Through VR

Overall Consumer Responses to VR Store Experiences

Designing VR Store Experiences: Structural Elements and Outcomes

During the pre-purchase phase, virtual reality has so far been mobilized primarily as a tool of experimentation, enabling consumers to visualize a destination or a shop and immerse themselves in its atmosphere in order to stimulate the desire to visit physically. However, beyond serving as a gateway to the real environment, VR can also extend the consumer journey by offering the possibility to conduct the purchase process entirely within a dematerialized environment. This is the principle underpinning *VR stores*, defined as a "3Dimensional interactive, sensory, and immersive experience using a virtual reality setup of retail stores that meets consumer desires and facilitates decision-making for purchases" (Mkedder et al., 2024, p. 3).

A growing body of research has examined these VR store experiences and their effects on consumers. Findings highlight a significant increase in satisfaction, supported by the reinforcement of positive attitudes toward the virtual environment (Mkedder et al., 2024), the acceptance of the technology through stronger intentions to use it and to make purchases within it (Han et al., 2020; Loureiro et al., 2021; Martínez-Navarro et al., 2019), as well as intentions to recommend it to others (Loureiro et al., 2021). These effects also extend to the retailer, notably through enhanced willingness to share positive word-of-mouth (Pizzi et al., 2020).

To understand how these effects are generated, several studies have analyzed the structural composition of VR store environments. Drawing on an interpretative structural modeling approach, Mkedder et al. (2024) identify *e-service quality* as the foundational element. This dimension encompasses factors such as navigation quality, virtual store design, security, and the presence of a virtual assistant. It underpins five interrelated variables : perceived ease of use, perceived usefulness, presence, pleasure, and escape, which together shape higher-order outcomes including shopping experience, trust, and attitude toward the VR store, ultimately converging on consumer satisfaction.

The mechanisms through which consumers develop an intention to use VR stores have been further explored by Han et al. (2020) through the lens of *flow*. The study identifies its core components, *telepresence*, *body ownership*, *control*, and *challenge*, as determinants of the acceptance and use of immersive environments. *Body ownership* refers to the sensation that parts of the virtual body are integrated into one's own body, while *control* corresponds to the feeling of being able to effectively interact within the environment. All these components, with the exception of *challenge*, show direct relationships with the perceived playfulness of the VR shopping experience, with *telepresence* exerting the strongest effect. In addition, *body ownership* and *control* positively influence perceived usefulness. Consumers view the technology as more beneficial when their virtual body resembles their own and when they experience a sense of mastery over interactions. Together, perceived playfulness and perceived usefulness act as mediators that foster both the intention to continue using VR stores and the intention to make purchases within them (Han et al., 2020).

A complementary pathway towards use intention emerges through the role of *escapism* in VR environments enriched by sensory cues, such as music (Loureiro et al., 2021). Escapism is defined as "the measure in which a user can temporarily forget the real world and dodge negative emotions that are caused by a stressful life" (Yee, 2006 ; van Kerrebroeck et al., 2017 ; as cited by Loureiro et al., 2021, p.289). This sensation activates both emotional and cognitive processes, notably *dominance*, the perception of control over the environment, and *cognitive elaboration*, the degree of mental processing stimulated by the experience. These two mechanisms jointly reinforce pleasure through

arousal, which plays a central role in eliciting positive emotions toward the VR environment. Pleasure, in turn, enhances the vividness of *presence* and the richness of mental representations of the environment, thereby stimulating both the intention to continue using the VR store and the intention to recommend it to others (Loureiro et al., 2021).

Beyond the mere intent to use, VR store environments also exert a significant influence on purchase intention (Martínez-Navarro et al., 2019). Two explanatory mechanisms are highlighted. The first operates through emotion, which enhances the sense of *presence* and thereby strengthens purchase intention. The second derives from the affective evaluation of the environment, which improves brand recall by reinforcing the perception of the brand's presence in the virtual store, similar to what occurs in a physical setting (Martínez-Navarro et al., 2019). On this point, Pizzi et al. (2020) observe that the proportion of participants correctly identifying the brand does not differ between a VR store and a physical store, whereas Martínez-Navarro et al. (2019) report that the virtual environment actually produces superior brand recall.

Thus, the advantages of VR stores are not confined to the immersive experience in itself, shaping consumers' broader attitudes and behavioral intentions toward the retailer (Pizzi et al., 2020). When enriched with auditory stimuli, these environments amplify the feeling of *presence* to levels surpassing those experienced in a traditional physical store. This enhanced sense of immersion improves the shopping experience, positively reshapes the perceived value of the store, and strengthens both patronage intentions and positive word-of-mouth regarding the retailer (Pizzi et al., 2020). This superiority of *v-commerce* over the physical store is further confirmed by Martínez-Navarro et al. (2019), who demonstrate that VR stores generate stronger cognitive and conative responses, ultimately leading to a purchase intention not only positive but also more pronounced than in a physical context.

Consumer, Technological, and Sensory Moderators

Several moderating variables intervene at different stages of the VR store experience. Among the stimuli embedded in the environment, music plays a determining role. A fast tempo strengthens the relationship between arousal and pleasure, whereas a slow tempo reinforces the link between *presence* and behavioral intention by encouraging consumers to remain longer in the store (Loureiro et al., 2021).

From a technological perspective, Martínez-Navarro et al. (2019) examined the influence of both content format and visualization device. Results show that a 3D format induces a stronger purchase intention than a 360° format, although without significant differences in emotional responses, affective evaluations, or *presence*. Regarding visualization devices, the use of a head-mounted display (HMD) provokes more discomfort than a PC monitor or Powerwall. However, this discomfort does not diminish the cognitive outcomes associated with purchase intention. On the contrary, the HMD generates a more intense immersive sensation, making it the most effective device.

Finally, consumer-specific characteristics also modulate the experience. Technology readiness amplifies the relationship between *telepresence* and perceived pleasure, while temporal distortion, an indicator of flow states, intensifies the association between body ownership and felt pleasure (Han et al., 2020).

From space exploration to the evaluation of virtual products

With the VR store environment now established and consumers ready to cross its threshold, the virtual purchase journey can begin. Following the initial discovery of the space and its atmosphere, the next stage unfolds as consumers explore and interact with the products displayed within it.

The influence of the virtual environment on product perception

Several elements specific to the virtual environment shape the way consumers perceive products. *Telepresence* continues to play a central role. Stronger in VR than on a traditional website, it enhances hedonic shopping value, although utilitarian value remains higher on websites (Alzayat & Lee, 2021). This feeling of presence is further reinforced when the experience is conducted through highly immersive devices such as HMDs rather than a computer screen (Bin Kim & Jung Choo, 2023; Meißner et al., 2020).

This dynamic produces several beneficial effects. First, telepresence stimulates perceptual curiosity, which subsequently fosters consumer creativity (Bin Kim & Jung Choo, 2023). It also increases enjoyment, which in turn influences spending behavior. Consumers become less price-sensitive and display greater variety-seeking tendencies, leading them to explore and try new products (Meißner et al., 2020). These exploratory behaviors intensify as consumers grow familiar with the virtual environment, with taste loyalty initially declining before gradually being replaced by variety-seeking driven by brand preferences (Meißner et al., 2020).

In the continuity of this exploration, Branca et al. (2023) demonstrate that product evaluations, particularly with regard to packaging, remain largely comparable between real and virtual environments. Consumer attitudes are consistent across contexts, with visual stimuli accurately perceived and recognized, although judgments about materials and durability appear less polarized in VR.

The visual presentation of products within the virtual environment also plays a decisive role in shaping purchase intentions. This effect operates through inspiration, defined as the psychological process that connects the emergence of a creative idea to its translation into concrete behavior (Raza et al., 2024). Contextual displays, which situate products within familiar consumer environments, elicit stronger inspiration and purchase intentions than imaginative displays, which diverge from conventional categories in terms of appearance and visual appeal (Raza et al., 2024).

Finally, the mental representation of the product proves decisive. The relationship between its presentation in VR and purchase intention is mediated by the extent of cognitive elaboration and the quality of image-based mental representations it generates (Zhang et al., 2024).

Explore, manipulate and try: the active experience of products in VR store

Once the shelves are discovered and the products visually considered, the virtual purchase journey extends through the possibility of moving around them and interacting more directly with the offer. In these highly immersive environments, consumers can browse the aisles and move as they would in a physical store. To assess whether this recovery of movement has a real impact, Schnack, Wright, and Holdershaw (2021) compared two locomotion techniques: motion-tracked walking and instantaneous teleportation. Their results reveal that both modes produce equivalent effects. Neither affects participants' emotional state differently, measured in terms of engagement, excitement, and stress through electroencephalography. And although navigation patterns diverge, with teleportation leading participants to "jump" between shelves, this variation does not alter purchasing behaviors, whether in terms of total spending, basket size, visit duration, share of private labels, likelihood of buying unfamiliar products, handling time, or number of impulsive purchases.

Beyond displacement, the ability to observe and manipulate products shapes the way they are mentally represented by consumers. Two distinct forms of embodiment emerge. The first is the *presentation of the body*, referring to how superficial properties, such as clothing, are evaluated by oneself or by others. The second, more profound, is the *extension of the body*, where an object is perceived as an extension of one's own body and integrated into the individual's position within the environment (Alzayat & Lee, 2021).

This interaction is further extended through simulated touch. Luangrath et al. (2022) demonstrate that the integration of *vicarious touch*, that is, observing a virtual hand in contact with a product, generates effects beyond the mere presence of a virtual body. This visualization induces a feeling of body ownership over the virtual hand, leading consumers to perceive it as a real extension of themselves. When this virtual hand, their hand, establishes contact with a product, it elicits a sense of psychological ownership, which increases the product's perceived value. This phenomenon, termed the *vicarious haptic effect*, enhances both purchase intention and willingness to pay. However, its strength is conditioned by certain factors. If the hand is merely imagined or visually unrealistic, no effect emerges. By contrast, individuals whose physiological arousal is heightened in VR (evidenced by elevated heart rate) experience a stronger sense of psychological ownership from observing the touch. Furthermore, for this touch to be effective, it must be *diagnostic*, meaning that the hand must contact the product in a meaningful way that allows for its assessment (Luangrath et al., 2022).

After having circulated, observed, and handled the products, the virtual shopping journey continues with their fitting. Virtual Fitting Rooms (VFR) are simulation technologies that allow consumers to try clothes on digital avatars (Yang et al., 2023). Although these tools are more praised for their hedonic appeal than for their utilitarian function, and often criticized for their lack of precision in reproducing shapes and colors, they nonetheless elicit favorable responses regarding their integration. By enabling virtual try-on, they provide consumers with a valuable decision-making aid (Batat, 2024). These technologies strengthen product evaluation, purchase intention, and even actual sales (Yang et al., 2023).

However, their effects are not uniform across all consumers. Body Mass Index (BMI) emerges as a moderating factor: the higher the BMI, the weaker, and in some cases even negative, the benefits become, as the experience can trigger a sense of self-image threat (Yang et al., 2023). Nevertheless, several levers can help overcome this phenomenon. Diversifying represented beauty standards, allowing the use of avatars that replicate the model's face rather than the consumer's own, stimulating prosocial behaviors, or emphasizing the status of the product are all strategies capable of mitigating the negative impact of BMI on virtual fitting experiences (Yang et al., 2023).

Finally, the virtual shopping journey ends with the interaction with *digital humans*. These avatars, endowed with high social characteristics in terms of intelligence and presence, can act as brand ambassadors or personal advisors, recommending items or responding to questions. Consumers are generally more inclined to engage actively with these entities rather than remain passive (Silva & Bonetti, 2021).

Individual and situational variables as filters of VR

It appears, however, that the experience of considering products is not uniformly shared by all consumers. It is modulated by individual, contextual, or product-related variables that shape how the effects of VR are translated. Regarding personality traits, some experiments have revealed a lack of significant influence. In a virtual grocery store, Schnack, Wright, and Elms (2021) observed no effect of participants' personality on purchasing behaviors: neither the number of impulsive purchases, nor the average product inspection time, nor the proportion of private labels purchased were affected.

Other dispositional and situational moderators, however, prove to be decisive. The type of environment constitutes a first example. Compared to reality-based VR stores, which replicate the logic of their physical counterparts, fantasy-based VR stores, whose degree of divergence from these rules is more pronounced, elicit greater perceptual curiosity. Moreover, these environments uniquely foster the acceptance of creative products (Bin Kim & Jung Choo, 2023).

The type of product presentation also interacts with individual characteristics. Raza et al. (2024) show that while contextual displays generally trigger more inspiration and purchase intent than imaginative presentations, this effect is reinforced among consumers with a high need for uniqueness, and becomes even more pronounced for symbolic products such as perfume, compared to jeans.

Other cognitive moderators also influence the virtual purchase journey. A high level of product knowledge has been shown to attenuate the effect of presentation format in virtual reality on cognitive elaboration and the quality of mental imagery, both of which directly influence purchase intention (Zhang et al., 2024). These knowledgeable consumers, generally less receptive to information provided by immersive devices, can nevertheless be encouraged to open up under certain conditions. First, through the integration of haptic cues (Cowan et al., 2021). Second, depending on the purchasing orientation, when it is experiential rather than utilitarian, the negative effect on mental imagery elaboration is reduced. Finally, the level of product involvement also determines the relevance of VR. For these consumers, the impact of VR on the development and quality of product knowledge remains negligible when involvement is low, but becomes significant again when involvement is high (Zhang et al., 2024).

Individual sensory preferences also play a moderating role. The *Need for Touch* exerts a specific influence. When it is instrumental, focused on the objective evaluation of the haptic properties of products, it tends to weaken the positive relationship between the VR experience and perceived hedonic value. Consumers attaching particular importance to tangible physical contact thus derive fewer benefits from an immersive experience where this contact remains simulated (Alzayat & Lee, 2021).

5.3.2. Purchase

So far, many studies have focused on measuring the impact of VR on purchase intention, confirming its determining role in consumer decision-making. Yet, beyond this behavioral projection, only a limited number of studies take the additional step of examining the *actual act of purchase*. To date, only two have directly measured transactions carried out within the experiment. One concerning the acquisition of products in a virtual store (Meißner et al., 2020) and the other the purchase of travel tickets (Skard et al., 2021). A third contribution, situated in the context of virtual fitting rooms, relies on real purchase data to demonstrate their impact (Yang et al., 2023).

Beyond this empirical validation, *VR store*-type environments also open the possibility of materializing the purchase directly within virtuality. The results already highlighted confirm consumers' willingness to complete their transactions in these universes (Han et al., 2020; Loureiro et al., 2021; Martínez-Navarro et al., 2019).

5.3.3. Post-purchase

Once the act of purchase is completed, the virtual reality experience does not come to an end. Instead, it unfolds into a *post-purchase* phase where the consumer remains engaged, no longer with the perspective of acquiring, but through the processes of use, appropriation, and recollection of what has been purchased. This continuity opens the way to novel forms of perception and affects that extend beyond the transactional act. The review of the literature highlights four distinct modalities through which VR shapes this stage, each offering a specific insight into how post-purchase experiences are transformed.

Delayed Effects of a Prior VR Experience

In some cases, virtual reality intervenes even before the actual experience begins, by projecting the consumer into a simulated version of the forthcoming product or service. Although situated within the pre-purchase stage, these anticipatory immersions exert a significant influence on how the subsequent real experience is perceived.

In the hotel sector, the possibility of virtually visiting an establishment prior to arrival alters the perception of the on-site experience. Consumers who preview the hotel through virtual reality report higher satisfaction with its real appearance compared to those exposed only to static images on a website. This effect is explained by the activation of *mental imagery* (McLean & Barhorst, 2022). By engaging in a conscious self-representation of future consumption situations, consumers reduce the dissonance between expectations and actual experiences, thereby reinforcing satisfaction during the visit itself (McLean & Barhorst, 2022).

These effects appear to transcend the type of immersive device employed, as no significant differences are observed between an HMD-based experience and a 360° computer tour (McLean & Barhorst, 2022). Similarly, in a retail context, the degree of immersivity in the virtual environment does not significantly affect satisfaction with product choice (Meißner et al., 2020).

The delayed influence of VR also extends beyond the moment of consumption. Satisfaction enhanced through VR previews fosters stronger intentions to revisit (McLean & Barhorst, 2022). More broadly, the integration of VR along the customer journey, including within the physical point of sale, emerges

as a strategic lever for sustaining the relationship between brand and consumer after the purchase (Farah et al., 2019).

VR integrated into the physical experience

Rather than being confined to the preparation or extension of an experience, virtual reality can be placed at the very heart of the action, functioning as an immersive activity embedded within a real environment. In this case, virtuality ceases to be a mere extension and becomes an integrated component of consumption itself.

In the broad field of tourism, Sujood and Pancy (2024) examined the acceptance of VR tourism-related technologies by identifying the determinants of consumers' intention to engage. Their results show that *Virtual Interactivity* and *Social Interaction* influence both *attitude* and *perceived behavioural control*. Social interactions and shared experiences encourage consumers to make decisions, strengthening their sense of control over the experience. These two variables have a direct impact on the intention to engage, an effect further reinforced by *perceived usefulness* and *trust*. Conversely, *perceived ease of use*, *motivation*, and *perceived risk* do not exert any significant influence, indicating that other factors play a more decisive role in this experiential context.

The integration of VR has been investigated more specifically in two contexts. In the museum setting, Li M. et al. (2024) show that visitors perceive virtual content as authentic. VR thus emerges as a suitable medium for presenting objects otherwise inaccessible to the public, particularly in the context of heritage preservation. However, this sense of authenticity depends on visitors' level of familiarity with museums. The more familiar they are, the more they compare virtual experiences with physical ones, which tends to diminish their sense of *presence*.

The second context corresponds to theme parks, where VR is integrated into a virtual roller coaster. Visitors who have participated in such experiences report overall satisfaction directly linked to the feeling of *being present* during the activity (Wei et al., 2019). To specify the elements contributing to this *presence*, the authors distinguish two categories of attributes. Functional attributes include *efficacy*, *efficiency*, *effectiveness*, and *vividness*. Experiential attributes encompass *temporal dissociation*, *focused immersion*, *heightened enjoyment*, *control*, *curiosity*, and *participation*. *Efficacy* refers to the ability of the VR system to operate properly and provide useful information, *efficiency* concerns fluidity and convenience of use, and *effectiveness* reflects the degree of support offered to the visitor, enhancing their overall experience.

Among these functional attributes, only *vividness* and *effectiveness* exert a significant influence, while the other dimensions have no notable impact. In this experiential context, recognized functional attributes therefore tend to be overshadowed by the sensory and hedonic characteristics specific to VR systems.

On the side of experiential attributes, the element that emerges as dominant is *control*. This feeling of actively shaping one's environment most strongly sustains the impression of *being present*. *Participation*, defined as the degree of interaction between the visitor and the virtual environment (Wei et al., 2019), also proves central, significantly influencing the evaluation of the VR roller coaster experience. Alongside these, *curiosity*, *heightened enjoyment*, and *temporal dissociation*, the sensation of losing track of time during the interaction, also play an important role. In contrast, *focused immersion* does not exert a significant effect (Wei et al., 2019).

Finally, the effect of *presence* thus constructed extends beyond immediate satisfaction. It also impacts the post-consumption phase, strengthening both the intention to revisit and the intention to recommend (Wei et al., 2019).

VR as the purpose of the consumption experience

Virtual reality can, instead of being integrated into an experience, become its very purpose. It is no longer merely a component of the experience but rather the environment in which it unfolds. This absolute virtuality has been explored through domains such as virtual tourism (Gastaldello et al., 2024; Petr & Caudan, 2024) and virtual reality fashion shows (Jung et al., 2021), where the entire experience takes place within a fully dematerialized universe.

Exploratory studies have investigated the meanings attributed to these experiences by users (Jung et al., 2021). In the context of luxury fashion shows in virtual reality, an innovative form of communication where consumers, via their immersive devices, attend a pre-recorded representation staged by the brand, participants reported intense emotions such as joy, excitement, and a sense of freedom. The immersion was also perceived as a rupture with traditional social and market hierarchies. VR thus emerges as a vector of empowerment, granting access to experiences previously reserved for an elite while maintaining, in the imagination of users, an intangible aura of exclusivity. At the same time, it is described as an escapism experience, offering moments of liberation from daily constraints (Jung et al., 2021). Yet, these experiences are not devoid of ambivalence. Feelings of anxiety, loneliness, and even fear can arise when proximity to material reality is highly perceived, but then they become aware of its shortcomings, such as the lack of social interaction (Jung et al., 2021).

Petr & Caudan (2024) examined consumers' aspirations and fears in relation to virtual tourism. Expectations were explicit, users primarily seek to explore real places that are difficult for them to access, within realistic environments that engage the five senses. Realism takes precedence over fiction : their interest does not lie in imaginary worlds but in the tangible reality from which they are excluded. However, participants expressed concern that in these hyper-realistic environments, an excessive degree of immersion might lead them to withdraw, voluntarily or not, as a way of protecting themselves from unpleasant sensation. They also voiced a desire for personalization, particularly the ability to regulate the level of immersion, thereby exercising greater control over the experience. These journeys are not perceived as mere hedonic escapes, but rather as a search for utilitarian balance, offering temporary emancipation from the fatigue and constraints of everyday life (Petr & Caudan, 2024).

In the more specific context of Virtual Wine Experiences, research has identified the profiles of users most attracted to these formats. Virtual Wine Tourism Experiences (VWEs) constitute a form of virtual tourism allowing consumers to remotely explore wine estates and regions, while engaging in activities such as tastings, guided visits, or masterclasses. These experiences may take place through immersive 3D devices requiring specialized equipment, or through more accessible formats such as videoconferencing (Wei et al., 2023).

The profile of participants generally mirrors that of traditional wine tourism enthusiasts, characterized by a high level of wine involvement, regular consumption, and a greater propensity to spend more per bottle. Several factors fuel this interest, including familiarity with digital tools related to wine, the appetite of younger generations for digital experiences, and the search for convenience, particularly among parents of young children with limited opportunities for physical travel. Paradoxically, individuals facing economic difficulties and with more limited travel budgets appear less inclined to participate. Risk aversion, notably heightened during the COVID-19 pandemic, as well as the intention

to engage in future wine tourism, also contribute, albeit more weakly, to the attractiveness of these virtual formats (Gastaldello et al., 2024).

Yet this ability of VR to transport individuals into exceptional universes, perhaps too exceptional, raises concerns once the immersion ends. The intensity of these simulated experiences may render the return to reality disappointing. Some users express fears of disenchantment, or even addiction, as the simulated world would surpass everyday life in emotional intensity. This potential loss of anchorage could have consequences such as deteriorating physical health, mental dissociation, social isolation, or a waning interest in family and professional life (Petr & Caudan, 2024).

The effects of VR use also extend into broader patterns of consumer behavior. Zolfagharian and Yazdanparast (2019) show that immersive technologies, much like other digital tools, fuel a dynamic referred to as the Consumer Immediacy Pandemic (CIP). This phenomenon drives individuals to constantly seek instant solutions to their needs, whether through real-time interactions, mobile accessibility during their movements, or virtual environments. Virtual reality fully integrates into this process by delivering instant satisfaction, liberated from spatio-temporal constraints.

The growing engagement with VR does not merely reinforce immediacy, it also reshapes consumers' relationship to their physical and emotional environment. This transformation is captured by the concept of unbundling of presence. The distinction between physical presence and virtual or mental presence progressively fades, redefining how individuals perceive their own presence, emotions, and relationships with others. As a result, the sensory boundaries between real and simulated worlds become porous, transforming human experience and amplifying the capacity for empathy within a multiplied universe (Zolfagharian & Yazdanparast, 2019).

VR in the service of post-experiential persistence

Once the consumption phase is completed and its effects begin to fade, does a place still remain for virtual reality within the consumer journey? An interest in re-integrating it when the experience seems to be coming to an end? According to the longitudinal study conducted by Aldossary and McLean (2022) in a tourism context, the answer appears to be yes.

Their results highlight the role that a virtual reality experience can play in the weeks following a real stay. While travel initially enhances happiness and a sense of meaning in life, even from the period preceding departure, individuals soon enter a drop-down process, a gradual decline in post-vacation well-being. This decline occurs more rapidly when the trip has been oriented toward hedonic well-being, centered on pleasure and happiness, than when it has fostered eudaimonic well-being, associated with personal growth and life meaning (Aldossary & McLean, 2022). Within this context, a VR experience linked to the trip enables the revival of both dimensions of well-being during this decline phase. Introduced eight weeks after the return, such a virtual immersion restores well-being to the level observed one week after the holiday or even beyond the level measured one week before departure. The effect is, however, more pronounced on hedonic well-being than on its eudaimonic counterpart. This ability to extend the benefits of travel rests on the feeling of presence, once again transporting the individual back to their destination (Aldossary & McLean, 2022).

This virtual afterglow can also fuel renewed intentions to visit. Experiencing a destination in virtual reality has been shown to positively influence travel intentions, both for first-time visitors and for those who have already discovered it. VR thus stimulates both initial visits and revisits (Tussyadiah et al., 2018). Yet for experienced consumers, the effect proves more limited, as prior knowledge of the destination collides with the simulated version, slowing down the imagery process and diminishing its impact (Skard et al., 2021).

5.4. Virtual reality, complement or substitute for real ?

5.4.1. What is real ?

Among the many definitions of virtual reality, Slater (2009) describes it as a new form of experience in which individuals perceive virtual space as the real world, and what unfolds there as actually occurring. The subjective construction of reality is grounded in the perceptions transmitted by our senses and in the interpretation we assign to them. Once an experience is perceived as authentic through its sensory and emotional effects, what remains to oppose to its immaterial nature? According to the ontological properties of the real, the virtual does not oppose reality but unfolds beyond materiality, and although imaged, it retains the attributes of the real (Shields, 2003). By erasing the boundaries between the tangible and the simulated, virtual reality situates users in environments where matter is absent, yet the feeling of living endures.

Given the breadth of meanings covered by the term *reality*, this section adopts a restricted definition, rooted in its Latin etymological origin *realis*, meaning “relative to things”, that is, considered in its concrete materiality. This conceptual clarification lays the foundation for a central question in this study. In view of the advantages offered by immersive environments, where the spatial, temporal, and social boundaries of the physical world tend to fade, a question arises: will these experiences remain confined to complements of real experience, or could they progressively replace it? If these boundaries are perceived primarily as constraints, does virtual reality not represent, precisely, the possibility of their transgression.

Most current applications extend, enrich, or prepare physical experiences, allowing consumers to anticipate them, explore them, or complement them with contextual entertainment. In this sense, VR functions as an extension of reality, a mediation that amplifies existing experience without replacing it. However, certain configurations grant full autonomy to VR: they do not merely reproduce the product or object of interest, but reconstitute the act of consumption itself. In virtual tourism or VR stores, the user no longer faces a simple prefiguration of the physical experience but directly lives the experience itself, whether visiting, discovering, or purchasing. The potential substitution therefore lies not in the possession of a digital object, but in the experiential dimension transposed into an entirely virtual space.

5.4.2. Supremacy of virtuality

Previous results have already emphasized the attractiveness, even the supremacy, of virtuality over physical environments, suggesting that consumers may perceive the substitution of real experiences as advantageous.

The absence of spatio-temporal constraints stands out as one of its most striking benefits. This immediacy offered by VR not only participates in but also responds to the dynamics of the *Consumer Immediacy Pandemic*, characterized by a constant pursuit of instant gratification. The distinction between physical and virtual presence has become second nature for contemporary consumers, whose daily lives are marked by a multiplicity of realities. This has paved the way for what Zolfagharian and Yazdanparast (2019) describe as an *unbundling of presence*, where it becomes natural to be physically located in one place while mentally immersed in another.

In parallel, the qualitative study conducted by Farah et al. (2019) highlights the aspiration, shared by experts and consumers alike, for what may be termed the "*omni-reality"*. This concept refers to the integration of VR across all marketing touchpoints, allowing the consumer to experience the entirety of a brand relationship through virtual immersion. Their findings also suggest that VR is particularly relevant in the initial stages of the customer journey, especially during awareness and consideration. At these stages, it even tends to outperform the physical store visit, enabling consumers to experience both the brand and its retail environment virtually.

Sensory cues and intangible attributes are also adequately perceived in VR contexts, with consumer evaluations closely matching those observed in physical environments (Branca, Resciniti & Loureiro, 2023). At the same time, VR shopping is marked by its ability to isolate individuals from their immediate surroundings, creating an escapist effect and intensifying the pleasure associated with the experience (Mkedder et al., 2024). This disconnection from reality fosters subjective well-being (Pala et al., 2022) and enhances the hedonic value linked to the act of purchase (Alzayat & Lee, 2021).

VR store environments have even demonstrated greater effectiveness than their physical counterparts in eliciting both cognitive and conative responses. Consumers report a stronger sense of (tele)presence in VR than in traditional retail settings, which translates into heightened purchase intention and stronger brand engagement. Remarkably, this superiority persists regardless of the devices or formats used (Martínez-Navarro et al., 2019).

In the context of virtual tourism, several results further support the idea of a possible substitution. The use of immersive headsets, for instance, reduces external interruptions and strengthens the feeling of *being present* in these alternative universes. This heightened immersion consolidates the perception of authenticity, understood as a unique and enjoyable lived experience in which the boundary between replica and original gradually fades (McLean & Barhorst, 2022). Presence thus emerges as a key factor explaining the effectiveness of VR as a substitute or simulation of travel (Tussyadiah et al., 2018).

The acceptability of these experiences is also reinforced by the widespread familiarity with digital tools, which makes consumers more receptive to virtual visits, as well as by their convenience, particularly for families with children, or their ability to mitigate health-related risks (Gastaldello et al., 2024). Beyond these practical benefits, virtual tourism addresses a deeper aspiration for temporary emancipation from the constraints of everyday life, granting the experience a genuine liberating function (Petr & Caudan, 2024).

This emancipatory capacity also extends to the social sphere. By opening access to forms of consumption once reserved for an elite, VR fosters a sense of empowerment. Users perceive themselves as in control, even up to the very definition of "reality" itself (Jung et al., 2021).

5.4.3. A complementary substitute

Despite the advantages highlighted so far, what the results increasingly reveal, through the removal of societal barriers, for instance, and as further studies and studies deepen, is that consumers primarily turn to VR as a substitute for what is usually inaccessible to them.

This tendency is also illustrated in commercial environments. Users report deriving greater benefits when VR grants access to experiences that would otherwise be unattainable in the physical world (de Regt et al., 2021). This power of access aligns with the ontological properties of the virtual (Jung et al., 2021). Virtual reality thus democratizes experiences once reserved for a privileged few, while still preserving a subjective sense of exclusivity. This dynamic rests on a dual reality of exclusivity: material, when scarcity stems from tangible constraints such as limited capacity, and immaterial, when it is tied

to the perception of rare access. VR experiences maintain, in the eyes of users, this intangible exclusivity, even though material scarcity is no longer relevant (Jung et al., 2021).

In the field of virtual tourism, consumer expectations reinforce this logic of substitution that is, paradoxically, complementary. What they seek is access to real sites and locations to which entry is restricted or limited, rather than fictional worlds. Their aspirations focus on immersive experiences faithful to reality and mobilizing the five senses (Petr & Caudan, 2024). In this sense, VR can also serve environmental and heritage preservation purposes: when access to natural or cultural sites must be restricted, it provides an effective alternative, enabling exploration while alleviating tourist pressure on fragile locations (Tussyadiah et al., 2018). The same principle applies to the museum sector, where VR environments are perceived as authentic and valued for their preservation potential (Li M. et al., 2024).

Finally, some sectors illustrate more hybrid practices. In wine tourism, Virtual Wine Experiences function as temporary alternatives or occasional complements to the physical visit, encouraged by the acceleration of digitalization but without aspiring to entirely replace the on-site experience (Gastaldello et al., 2024).

5.4.4. Barriers to substitution

If virtual reality opens numerous possibilities in terms of experience, it nevertheless encounters barriers that limit its potential as a full substitute for material reality. These obstacles emerge across sensory, social, technological, and psychological dimensions.

From a sensory perspective, boundaries are particularly evident in commercial environments. Some consumers place paramount importance on *instrumental need for touch*, that is, the necessity to evaluate products through tactile cues such as weight, warmth, or texture. When this need is high, VR struggles to reproduce the physical experience satisfactorily, thereby reducing its hedonic value (Alzayat & Lee, 2021).

On the social level, research highlights a deficit of interaction within virtual environments. In domains such as tourism or wine tourism, many consumers attach central importance to the collective and relational dimensions of the experience (Gastaldello et al., 2024). Yet, the isolation inherent in the use of VR prevents these dimensions from being fully reproduced, explaining the reluctance of individuals to virtually engage in moments traditionally marked by strong social components (Batat, 2024). This relational lack can even give rise to negative emotions, resulting from the dissonance users perceive between the realism of the environment and the absence of expected social exchanges, leading to feelings of anxiety, loneliness, or even fear (Jung et al., 2021).

Technological constraints further impede substitution. Paradoxically, a strong *technology readiness* can reduce perceived presence and felt pleasure, as highly familiar users tend to compare the VR experience more systematically with its physical counterpart, thereby accentuating perceived shortcomings (Li M. et al., 2024).

Finally, these limits are compounded by physiological constraints associated with prolonged exposure. Extended use can induce progressive saturation, diminishing perceived benefits and weakening the overall impact of the experience (Pala et al., 2022).

5.4.5. Satiation of the physical world

If the satiation resulting from an overconsumption of virtual reality can mitigate its perceived benefits (Pala et al., 2022), an excessively realistic virtuality can also induce satiation vis-à-vis its physical

equivalent. Deng et al. (2019) demonstrate that a vivid and interactive VR experience, when it approaches reality too closely, can reduce the subsequent intention to engage in the real experience. This phenomenon is explained by the perception of an overly strong similarity between the virtual and the physical experience, leading to a form of psychological satiety. Users, already "satiated" by the virtual version, may perceive the investment required for the physical experience as less worthwhile.

This effect is nevertheless moderated by *enduring involvement* (EI), a stable trait reflecting an individual's long-term interest in a given product or experience category. Individuals with high EI, being more engaged with the category, perceive weaker similarity between the virtual and the physical universes and thus maintain their intention to consume the real experience.

The intensity of this satiety also varies depending on the type of activity, given their distinct objectives. Experiences oriented towards cognitive or emotional stimulation, such as museum exhibitions or live performances, are more vulnerable to this risk. Conversely, for activities aimed at providing a change of scenery or requiring physical practice outdoors, interactive and immersive VR experiences tend to reinforce rather than replace the desire for physical participation. The current technological inability to capture the essence of these practices prevents any perception of equivalence between formats (Deng et al., 2019).

Even when the intention to visit decreases, this does not imply that VR is considered a true substitute. Its influence on the intention to recommend the actual visit to others remains significant and positive, confirming that the physical experience preserves its legitimacy and value in consumers' eyes (Deng et al., 2019).

Nevertheless, a residual risk persists, linked to the possibility of developing an addiction to the emotional and sensory intensity of VR experiences, deemed too "magical" or too perfect compared to everyday life. In this case, substitution would emerge not through satisfaction, but through fear: disenchantment with reality fostering a form of psychological dependence (Petr & Caudan, 2024).

5.5. Discussion

5.5.1. The fundamental role and contributions of virtual reality

VR as a tool for engagement and persuasion in the pre-purchase phase

In line with the conclusions of Farah et al. (2019), the results of this systematic literature review confirm that virtual reality reveals its potential most convincingly in the upstream phases of the consumer journey. It is at the stage of engagement that its role appears most decisive, notably through its persuasive power. The majority of studies have concentrated on this pre-purchase stage, underscoring its capacity to foster positive attitudes and stimulate behavioral intentions. By bringing products or destinations closer to the user, VR generates desire and strengthens consideration (Anaya-Sánchez et al., 2024).

The power of immersion and (tele)presence

At the heart of this mechanism lies *telepresence*, which plays a transversal role in the construction of experience. For it to emerge, the environment must be genuinely immersive. VR headsets, by blocking external stimuli, facilitate this immersion, yet the type of device only explains a limited part of the feeling of presence (Di Dalmazi et al., 2024).

Immersion is also built through the integration of *sensory cues*. From the perspective of sensory marketing, individuals perceive the world through their senses (Miller & Stoica, 2004), which influence not only perception but also judgments and behaviors (Krishna, 2012).

Although technologies capable of faithfully reproducing the senses are still under development and not always implemented, the mere presence of sensory signals—such as sounds, visual textures, music, or olfactory elements—already produces significant effects. These stimuli are not only perceived, they are truly felt. They enrich *mental imagery* and strengthen *presence*, making immersion sensory in nature. The more sensory cues are mobilized, the more the individual feels, and thus lives, the moment (Alyahya & McLean, 2022).

Hearing, through music, intensifies emotional responses (Pizzi et al., 2020). Olfactory cues, when combined with vision, foster even deeper immersion (Cowan et al., 2023). Visual images can thus facilitate the mental evocation of scents, even in the absence of real stimulation (Cowan et al., 2023). Touch also emerges as one of the most sought-after senses in immersive environments (Batat, 2024). The mere perception of textures, or even the visualization of a virtual hand interacting with an object, strengthens the feeling of contact and induces effects similar to those generated by physical touch (Cowan et al., 2023; Luangrath et al., 2022).

In this sense, *sensory cues* go beyond a simple role of stimulus reproduction, as they actively contribute to the construction of the experience. Yet, they remain largely studied in isolation. Only one study considered their combination through the concept of *sensory immersivity level* (Alyahya & McLean, 2022). It therefore appears essential to explore more systematically not only the effects of individual senses, but also their cross-effects, in order to identify the most relevant applications and combinations, while avoiding the risk of cognitive overload.

Interactivity

Immersivity is not determined solely by the type of support, and the same HMD headset may be qualified as “high immersive” or “low immersive” depending on the degree of control it grants to the user (Anaya-Sánchez et al., 2024). Moreover, if vividness matters, it can be just as high in a traditional video as in a VR environment (Spielmann & Mantonakis, 2018). The true differentiating element lies in the possibility to interact, navigate, and shape one’s own experience.

Immersion, in itself, remains a neutral psychological state, devoid of intrinsic valence, and is not exclusive to VR. It can equally be induced by other media such as a film, a book, or a play (Hudson et al., 2019). What distinguishes VR is that the user no longer simply observes: they move from the status of passive spectator before an object to that of an actor in their own journey. Presence is not reduced to a state of mental absorption, it corresponds to an active movement of the mind into another space. For the user to truly feel present, it is not enough for the environment to be rich in stimuli, he must have control over it.

This demand for activity resonates with the state of *flow*, often reached at the peak of immersion. *Flow* refers to an optimal, pleasurable state that requires active engagement (Spielmann & Mantonakis, 2018). Interactivity thus becomes the central pivot of the immersive experience: the user no longer merely undergoes it, but actively shapes, navigates, and manipulates it.

5.5.2. Design of virtual environments and contextual adequacy

Choice of formats according to the nature of the experience

The design of virtual environments cannot be conceived independently of their context of use. Batat (2024) emphasizes that the chosen format must be consistent with the type of experience proposed. In experiential contexts such as tourism, entertainment, or museums, 360° formats appear more suitable than in commercial settings. These formats provide a visually realistic immersion that reflects an already existing environment.

This logic is confirmed by the classification of the analyzed studies: virtual tours are most often presented in 360°, whereas VR stores almost systematically rely on 3D modeling. The 360° environments prove particularly conducive to stimulating the desire to visit, likely due to their perceived factual realism (Orús et al., 2021). Whether in tourism or retail, these virtual tours operate according to the same mechanism: they allow the user to experience the atmosphere of a place in order to guide their choice and encourage their intention to visit. The user is not projected into a reconstruction, but into a captured version of reality.

In contrast, product-oriented contexts, unlike tourism, open the possibility of designing entirely virtual spaces. Users may explore shops that do not exist in the physical world or evolve within environments specifically created for product interaction. In these cases, the 3D format stands out as the most suitable, offering both freedom of movement and direct manipulation of objects.

Realism and creativity: beyond simple replication

Regarding the design of VR stores, some authors warn against excessive fidelity to their physical counterparts. Reproducing spatial or functional constraints identically would amount to transposing into the virtual realm the very limitations that VR is meant to transcend (Branca et al., 2023). Instead, VR opens the way to alternative universes, notably through fantasy-based boutiques that stimulate

consumer curiosity and creativity (Bin Kim & Jung Choo, 2023). While this creative potential is undeniable, its concrete effects on attitudes or purchase intentions have not yet been empirically examined. At the same time, Loureiro et al. (2021) emphasize that environments departing too radically from familiar formats may induce a perceived loss of control, leaving users uncertain about how to interact and thus reluctant to repeat or recommend the experience.

The role of technological supports

The design of the experience cannot be conceived independently of the technological support through which it will be delivered. The most immersive devices, such as HMD headsets, although sometimes associated with discomfort, remain predominant (Martínez-Navarro et al., 2016). They reinforce the feeling of *telepresence* and enrich the overall experience (Anaya-Sánchez et al., 2024). However, this increased immersion does not necessarily translate into stronger effects on final intentions (Orús et al., 2021). Several studies indicate that simpler virtual experiences, with lower levels of immersivity, can already generate significant impacts on attitudes and intentions (Pleyers & Poncin, 2020). Such solutions therefore represent accessible alternatives, particularly suited to small retailers with limited resources.

5.5.3. Psychological and behavioral responses of consumers to VR

The affective and cognitive responses generated by VR

From the components described in the previous sections, particularly *telepresence* and interactivity, a series of affective and cognitive responses emerge in the user. By moving beyond the posture of a mere spectator, VR allows for more fluid and playful interactions with providers (van Berlo et al., 2021). Such interaction is accompanied by a perception of greater honesty and transparency in the offer presented (Spielmann & Orth, 2021).

One of the major effects of this dynamic lies in the stimulation of genuine learning. The user can manipulate a product, observe it from different angles, or even explore a destination while sensing its atmosphere and projecting themselves into future use (McLean & Barhorst, 2022; van Berlo et al., 2021). This learning process relies heavily on the activation of *mental imagery*, enabling anticipation of what will be experienced or consumed, and of the pleasure that will be derived from it (Skard et al., 2021). In this way, immersive experiences enriched with sensory information promote the acquisition of knowledge about the destination and strengthen positive attitudes towards it (Alyahya & McLean, 2022).

Yet the VR experience is not limited to rational information processing. It equally mobilizes emotions that shape behavior, sometimes triggering irrational, spontaneous decision-making such as impulse purchases (Li S., 2024). The construction of positive emotions, arousal, enjoyment, and pleasure, fosters an affective bond between the provider and the user through more bidirectional and engaging interaction. This bond extends beyond the appreciation of the product itself, nurturing positive attitudes towards the brand as a whole (de Regt et al., 2021; Pizzi et al., 2020; Pleyers & Poncin, 2020; van Berlo et al., 2021).

The debate between cognitive and affective variables in purchasing decision

As shown previously, the immersive experience triggers both emotional and cognitive reactions. These two dimensions coexist, interact, and both play a crucial role. However, it appears that it is the cognitive

variables that ultimately guide the decision-making process and shape consumer intentions (Kim M.J. et al., 2020; Martínez-Molés et al., 2022).

Several results support this direction. Di Dalmazi et al. (2024) emphasize that, despite the ability of immersive media to generate strong emotional engagement, it is cognitive rationalization mechanisms that determine final intentions. More specifically, it is the mental construction of *being at destination*, rather than the intensity of emotional reactions alone, that drives the decision. In other words, relying exclusively on the emotional impact of an experience, even a memorable one, is not sufficient to trigger action.

Yet, affective responses cannot be regarded as secondary. On the contrary, they act as the gateway into the experience, encouraging users to engage and explore the virtual environment (Li M. et al., 2024; Wei et al., 2019). They also extend beyond the purchasing framework by nurturing favorable attitudes and an affective bond towards the provider that delivered this pleasurable experience (Pleyers & Poncin, 2020). In this sense, VR proves particularly suited to hedonic contexts, where experiential value outweighs purely functional attributes. Users do not necessarily seek performance or ease of use; they willingly engage, even learn, as long as the system delivers enjoyment (Alzayat & Lee, 2021; Sujood & Pancy, 2024).

Ultimately, emotion makes the experience desirable, while cognition makes it actionable. However, affective variables may have been underestimated, as most studies relied on subjective questionnaires. To reduce this potential bias, future research should complement self-reported data with objective measures of arousal and enjoyment, for example through sensors or psychophysiological analyses (Tussyadiah et al., 2018).

Nevertheless, even if these affective mechanisms have been partially overlooked, the question of their durability remains. If the pleasure experienced is largely tied to the novelty effect, the influence of VR may gradually diminish as this novelty fades.

The ambivalence of causal relationships in literature

Another salient point concerns the ambivalence observed in the place of certain variables according to the studies, in particular *enjoyment*, *imagery* and *authenticity*.

Regarding emotional variables such as *enjoyment*, it appears that they play a bi-directional role with the notion of *presence*. Feeling present can amplify enjoyment, while enjoyment can in turn reinforce the sense of *presence* (Li M. et al., 2024; Tussyadiah et al., 2018). This dynamic has been further validated by Leveau & Camus (2023). Nevertheless, if the impact of enjoyment on *presence* and its causal relation are confirmed, *presence* itself can also act directly on intentions and attitudes, without necessarily transiting through enjoyment.

The case of *mental imagery* also illustrates this ambiguity. While some studies position it as an antecedent of *telepresence*, its conceptualization as the imagination of future consumption suggests rather a role as a consequence. As highlighted by Skard et al. (2021), *telepresence* corresponds to an immediate psychological state, activated upon entry into the virtual environment, whereas *mental imagery* belongs to a more elaborated cognitive process. Although this process can reinforce the feeling of presence, the act of projecting oneself into the subsequent physical experience seems to emerge more as a downstream effect.

Finally, *authenticity* also constitutes a case of ambivalence. When apprehended as a degree of similarity with the real, it tends to be positioned as an antecedent of *presence*. However, when the emphasis is

placed on its experiential dimension, conceived as an original and unique experience, its connection to *presence* becomes more elusive.

These discrepancies do not undermine the overall understanding of the phenomenon but instead underline its complexity. Within virtual environments, variables intersect in a dynamic and reciprocal process, blurring at times the distinction between antecedents and consequences.

5.5.4. The Effectiveness of VR according to Application Contexts

Limits at the purchase stage

If virtual reality significantly enriches the overall experience, its effectiveness appears more limited when it comes to triggering the actual act of purchase (Pizzi et al., 2020). Several studies indicate that immersive devices, such as HMD headsets, enhance the lived experience without directly increasing purchase intention (Martínez-Navarro et al., 2019; Orús et al., 2021). Their impact is instead observed at the level of brand attitude, notably through the activation of *mental imagery* mechanisms that remain more focused on the context than on the product itself (Hilken et al., 2022).

The study by Martínez-Molés et al. (2022), conducted in the cruise sector, illustrates this finding particularly clearly. VR largely surpasses online 2D images in terms of product knowledge and attitude towards the brand, yet this superiority does not translate into a stronger purchase intention. Although VR fosters *presence*, *enjoyment*, and *interactivity*, a highly immersive environment is therefore not sufficient in itself to induce behavioral conversion.

This limitation is all the more concerning given that very few existing studies measure actual purchasing behaviors. The majority remain confined to stated intentions, with only two incorporating an effective behavioral measure. While behavioral intentions are theoretically considered the main antecedents of actual behaviors (Ajzen, 1991 ; as cited by Orús et al., 2021, p.3), their conversion into concrete acts remains subject to caution.

The question arises even more acutely in the field of tourism, widely recognized as one of the sectors most compatible with VR. Indeed, the involvement required in the purchase of a trip is much stronger than that of an ordinary consumer good. The study by Tussyadiah et al. (2018) shows that VR positively influences the intention to visit, whether for local tourism or more distant destinations, though with a diminished effect in the latter case. This decrease may reflect an implicit consideration by participants of the cost or complexity of the act. However, no study to date has been able to confirm the existence of such a consideration in the evaluation of intention.

Most suitable contexts of use

In addition to being more suited to hedonic than utilitarian situations, VR also proves to be more adapted to contexts than to individual products, and thus to experiential sectors (Mishra et al., 2021).

This is precisely what makes it a particularly relevant tool for tourism. While in the case of products, VR mainly offers the possibility of shopping from the comfort of one's home, it provides future tourists with an unprecedented opportunity: to *try out* a place in advance, to sense its atmosphere, and to visualize its possibilities (Tussyadiah et al., 2018). By symbolically bringing destinations closer, VR offers consumers a sensory, interactive, and convincing preview that fosters attitude modification (Anaya-Sánchez et al., 2024; Tussyadiah et al., 2018).

Differentiated efficiency according to the products

The effectiveness of VR also varies according to the type of product concerned. It appears more pronounced for objects perceived as an extension of oneself than for those associated with self-presentation, such as clothing (Alzayat & Lee, 2021). This discrepancy may, however, be partly explained by the design of the virtual environment used in the study, which favored manipulation and functional exploration but may have been less convincing in representing fine or aesthetic visual attributes.

In this regard, certain tools such as Virtual Fitting Rooms (VFR) have emerged and could help restore the effectiveness of VR for products with a strong aesthetic dimension. Yet, these technologies demonstrate only moderate efficiency. Although virtual trials are still often considered too approximate, their effect on product evaluation and purchase intention is nonetheless present (Batat, 2024; Yang et al., 2023).

As for everyday products, characterized by low involvement, they derive only limited benefit from immersive environments. Their regular use, familiarity, and low emotional weight reduce the relevance of VR experiences and hardly justify their cost. Conversely, VR becomes particularly strategic for products involving high consumer engagement, or for new goods unfamiliar to the consumer. In these cases, the immersive experience can counterbalance the absence of prior reference points or compensate for the lack of physical contact (Zhang et al., 2024).

Paradoxically, even in utilitarian contexts, the rich media provided by VR can stimulate arousal, making the experience more pleasant than a conventional presentation would. This explains why purchase intention can, in some cases, be reinforced even for products with little emotional appeal (Hudson et al., 2019; Mishra et al., 2021).

Particularly favourable sectors

Some sectors appear to be particularly well aligned with the characteristics of VR. Wine represents one such example, standing at the crossroads of product and experience. Real estate is another, combining place, service, and material investment. In this latter case, VR not only improves the perception of the property but also strengthens attitudes towards the provider itself (Pleyers & Poncin, 2020).

Sectors absent or poorly adapted

Other sectors remain underexplored in the literature. Luxury, for example, is mentioned in only one study within this selection. This study does not directly examine luxury consumers but instead focuses on the virtual reproduction of an experience normally inaccessible. The question of VR's true relevance to this sector therefore remains open. Certain factors could nonetheless argue in its favor: luxury carries a strong experiential dimension, offers products with high involvement, and cultivates a privileged emotional bond with the brand (Mishra et al., 2021; Zhang et al., 2024). Yet other aspects could challenge this integration, particularly the risk of democratizing an experience that is supposed to remain exclusive (Jung et al., 2021).

Moreover, VR is characterized by its capacity to give control back to the user, rendering them active in their journey. In the luxury universe, however, consumers are more accustomed to being guided, cared for, and even pampered. This raises a crucial question: how relevant is it to reintroduce autonomy in a context where carefully framed passivity is itself part of the experience? Should VR, in this case, be restricted to strictly narrative or emotional applications? Or could a hybrid alternative be envisaged

through the integration of an avatar-advisor? If so, what traits, behaviors, and posture should such a virtual assistant embody in order to remain aligned with the codes of luxury?

Finally, other sectors were scarcely represented in this selection. Beauty and furniture belong to this group, likely due to their strong physical anchoring. For these categories, augmented reality appears to offer a more suitable compromise, enabling products to be virtually integrated into the user's everyday reality rather than transposed into a fully reconstructed universe.

The moderating role of prior knowledge

What this review has shown is that VR, while effective at blocking external stimuli and detaching the user from their immediate surroundings, struggles to overcome internal elements such as prior consumer knowledge. This prior knowledge, rooted in past experiences or even simple online searches, constitutes a powerful filter in immersive information processing (Cowan et al., 2021; Skard et al., 2021). Across numerous studies, it has been identified as a moderator with predominantly negative effects, often reducing the effectiveness of VR.

This phenomenon stems from a conflict between pre-existing mental representations and the information conveyed by the virtual environment. When the two sources diverge, individuals tend to prioritize their established cognitive schemas (Zhang et al., 2024). This effect occurs regardless of the type of knowledge held. When knowledge is drawn from direct experiences, such as previous visits or product use, consumers naturally give it greater weight (Cowan et al., 2021; Skard et al., 2021). Yet, it also manifests when representations are derived from simpler sources, such as prior online searches or images (Li S. et al., 2024).

Only two studies reported a potential positive influence of prior knowledge, suggesting that individuals with greater expertise may be better equipped to appreciate virtual representations thanks to their refined sensitivity. However, this effect was confirmed in only one case, in the other, knowledge once again acted as an inhibitory factor (Wen & Leung, 2021). The sole confirmed positive outcome comes from a very specific context: an immersive wine experience designed to promote bottle purchases through a virtual tour of the production site. In this case, expert consumers perceived VR not as a substitute but as an extension of their knowledge. Information on soil nature, sun exposure, or cultivation practices actively nourished and activated their expertise (Wen & Leung, 2021).

Overall, these results suggest that prior knowledge can only play a positive role when the virtual environment seeks not to replace it but to complement it. This shift in perspective, from substitution to complementarity, appears essential. As emphasized by Skard et al. (2021), for experienced consumers, VR must deliver content that goes beyond already consolidated memories, knowledge, or mental images. In other words, it must be tailor-made, breaking away from the one-size-fits-all logic that still dominates most current devices.

5.5.5. A technology with underexploited potential in the consumption phase

The consumption and post-consumption phase remains scarcely explored in the literature, with almost all identified studies focusing on experiential contexts.

Only a handful adopt a longitudinal perspective. One such study demonstrates that pre-viewing a destination in VR fosters alignment between expectations and the subsequent real experience, thereby increasing both satisfaction and the intention to revisit (McLean & Barhorst, 2022). In contrast, another study examining satisfaction with selected products finds no significant effect of immersion level (Meißner et al., 2020). Yet, no research to date has compared satisfaction derived from products chosen through VR with that generated by a direct physical experience.

In addition, several works examine the effect of VR on brand advocacy or positive word-of-mouth intentions, but always within a pre-purchase framework. It is plausible that such intentions may vary depending on post-consumption satisfaction. Furthermore, no cases of dissatisfaction were reported in the studies included in this review, leaving a crucial question unresolved. If the product or experience ultimately fails to meet expectations, such disappointment could potentially be projected back onto the virtual environment itself, thereby undermining consumer trust and willingness to engage with these devices in the future.

Also, the use of VR as an activity during the consumption phase remains only marginally studied, despite its recognized capacity to enrich the experience. Existing research relies primarily on post-experiment questionnaires rather than direct in situ observation. Moreover, tourism activities are often approached generically under the label of VR-related activities, without focusing on specific experiences (Sujood & Pancy, 2024). One study shows that VR, when perceived as authentic, can be integrated into a museum context; however, this research still pertains to a pre-purchase situation and relies on a low-immersivity device (Li M. et al., 2024). An approach based on HMDs, embedded within a real visit, could have provided a more meaningful perspective on the experiential use of VR in actual consumer contexts.

When it comes to VR as a consumption purpose in itself, studies are limited to immersive tourist experiences. The purchase of virtual products remains largely unattractive in current VR environments, likely due to the absence of social interactions and symbolic recognition (Nunkoo et al., 2024). In such settings, the user is isolated, free from external gaze, and the act of purchasing loses its status-conferring function. Virtual tourism itself continues to be examined mostly at a conceptual level, with research centered on consumer expectations, profiles, and perceived benefits, while empirical validations in real-world contexts remain absent.

Finally, a single study identifies an application in the post-consumption phase, where VR is used as a memory tool to extend the pleasure of a past travel experience (Aldossary & McLean, 2022).

Taken together, these results show that although the promises of VR in experiential contexts are manifold, its potential remains underexploited once the purchase phase has passed, and is practically absent in product-related contexts.

5.5.6. Complementarity, substitution and risk of disenchantment

The idea conveyed throughout this thesis is that virtuality is not opposed to reality, but rather exists alongside it. Materiality alone is insufficient to encompass the full scope of our vision of reality. What virtuality represents is in fact its immaterial dimension, emotional, cognitive, and symbolic, thus completing its conception. With regard to immersive technologies, these environments remain designed, the propose idea is not that individuals perceive them as “real.” The idea is not that individuals perceive them as real. Considering them authentic essentially implies that they are 'fake', and reality does not need to resemble itself. What matters is not whether the environment is real, but whether the emotions and sensations it elicits are.

The review shows that virtual reality clearly outperforms classic forms of online commerce. V-commerce appears not as a substitute, but as a natural evolution of e-commerce (Xue et al., 2020). Conversely, VR does not function as a substitute for physical experiences. Consumers show little interest in living these experiences in a virtual version when they can access them physically (Petr & Caudan, 2024). Moreover, prior knowledge of places tends to limit the effectiveness of such environments (Skard et al., 2021).

VR therefore does not position itself as a replacement for what is already accessible, but rather as a complementary substitute: a temporary alternative to what is not. In this sense, a form of interconnection between the real and the virtual emerges.

VR acts as a powerful persuasive tool, enabling users to virtually experience a shop, a destination, or a place, and awakening in them the desire to live it in reality.

VR therefore leads back to reality. And for what individuals cannot access in their physical world, virtuality is what will deliver it to them. Yet this experience paradoxically draws its strength from the real. No fascination arises from fictitious environments without anchorage. What fuels desire is the certainty that the experience has a real, but inaccessible, existence. Even when the material barrier disappears, this awareness remains in the user’s mind, reinforcing the uniqueness of what they are living (Jung et al., 2021).

VR thus stimulates a lack, reveals a gap between what is seen and what could be lived. Individuals then seek to bridge this distance, to cross the threshold between the two worlds. But when the gap is perceived as too narrow, stimulation may turn into satiation. The user, already fulfilled, no longer feels the need to go further (Deng et al., 2019).

This logic is particularly salient in the case of experiential goods, which, unlike material goods, are not designed to be endlessly repeated. Yet it fundamentally depends on the user’s intention. A virtual visit may satisfy a quest for cognitive or emotional stimulation, but it cannot fulfill an intention such as walking. It is therefore not the environment alone that dictates satiation, but the purpose that directs it. And although such experiences may at times suffice to temper the urge to move, they are nonetheless not consciously perceived as substitutes for physical reality (Deng et al., 2019).

However, if a deliberate and conscious substitution seems both limited and undesired, another, more insidious form of substitution may nevertheless emerge. This concern lies at the heart of fears expressed around immersive technologies. For if VR is often presented as a means of “re-enchanting” experience, its very intensity could have the opposite effect, leading to a “disenchantment” with daily life. A heightened need for escapism, combined with the desire to control reality, could render these virtual experiences, rare or inaccessible in everyday life, addictive. This would foster a dependency that

diverts users from the physical world to the benefit of one in which they master every parameter (Petr & Caudan, 2024).

6. Conclusion

6.1. Contribution

This study makes a significant academic contribution to research on immersive technologies and their role in the consumer experience, by conducting a systematic review of scientific works published between 2018 and 2024, without restriction regarding the sectors studied, the types of devices, or the virtual environments designed.

Starting from a corpus of 51 articles, it first provides a structured overview of the state of research, classifying the sectors, technologies, virtual environments, and theories mobilized. This methodical organization offers a comprehensive mapping of the contexts in which VR has been explored.

On this basis, the analysis synthesizes and illuminates the results of these works through the three research questions that guided this thesis. It first reveals the attractiveness of VR, both for consumers and for retailers, before developing an integrated vision of the consumer journey, from the initiation of the experience to its post-purchase extensions.

In the pre-purchase phase, the findings highlight VR's ability to *enhance* the consumer experience, by identifying the key elements that structure it as well as the affective and cognitive effects leading to positive attitudes and behavioral intentions towards the product, the destination, or the *provider*. In the purchase phase, however, the power of VR appears more limited at the very moment of the act of purchase. In the post-purchase phase, the study identifies four distinct modes of action: the delayed influence of a virtual experience on the perception of reality; its integration during the physical consumption of an experience; its use as a consumption purpose in itself; and finally, its capacity to revive past experiences.

These results underline that the scope of VR applications along the consumer journey differs depending on whether the context is product-oriented or experiential. In product-oriented contexts, the act of shopping can take place entirely within a VR store, a possibility still unexplored in experiential contexts, yet its effects tend to stop at the point of purchase, without further impact during consumption or post-consumption. Conversely, in experiential contexts, VR extends its influence well beyond the purchase, generating additional benefits and opening the way to new applications even during the post-consumption stage.

Following this examination of the attractiveness, possibilities, and effects of VR, the study addresses its central question: does VR act as a complement or as a substitute for reality? Despite certain identified risks and emerging calls for an "omni-reality," the results converge towards the idea that VR functions above all as a complement, with physical and virtual universes extending and enriching one another.

Finally, this research highlights the current limitations of VR, whether in the magnitude of its effects, in the boundary effects between physical and virtual, or in the scope of its applications across contexts. By discussing these findings, it offers a global, nuanced, and contextualized vision of the impact of VR, while also revealing the tensions, contradictions, and gaps that run through the literature. The identification of these gaps opens promising avenues for future research, which will be presented in the following section.

6.2. Proposition for new research

The prospects for future research can be structured around several complementary axes. From a methodological standpoint, existing work still relies largely on subjective measures of *presence* and *enjoyment*. The integration of objective methods, such as sensors or psychophysiological analyses, would reduce declarative biases and provide more reliable data (Tussyadiah et al., 2018).

The transition from intention to action remains a priority field of investigation. Most studies focus on declared intentions without measuring real *behavioral outcomes*, leaving the actual impact of VR on purchase behavior uncertain. It would also be relevant to examine the effects of VR after the purchase itself, particularly its influence on recommendation intentions. Moreover, in cases of dissatisfaction, research should determine whether the VR experience affects the overall perception of the technology. Studies conducted under real-life conditions, including situations where the buyer and end-user differ, are particularly necessary (Raza et al., 2024).

The question of realism in virtual environments, especially in relation to alternative universes in VR stores, also deserves further exploration. Future research could assess whether brands should privilege realistic or imaginary environments, and evaluate the effects of these choices on consumer experience, satisfaction, and engagement. In parallel, more situational research appears necessary in experiential contexts. It would also be appropriate to assess the suitability of immersive technologies according to sectors, such as clothing, tools, or large-scale retail, and identify optimal technological solutions. Comparisons between VR and other immersive solutions, such as AR or MR, would help determine the most relevant applications depending on the context.

The sensory dimension constitutes another promising avenue. Future studies could investigate the specific or combined use of sensory cues in order to identify optimal combinations across contexts, while also assessing the risks of cognitive overload that may interrupt the sense of flow when realism becomes excessive (Alyahya & McLean, 2022 ; Cowan et al., 2021).

Socio-demographic characteristics also require greater attention. Age, gender, or cultural background may significantly shape perceptions and acceptance of VR, calling for more diverse and representative samples (Anaya-Sánchez et al., 2024). In addition, the cultural image of VR, shaped by socio-symbolic discourses, is likely to evolve over time and contexts (Jung et al., 2021).

In the luxury sector, several open questions remain. Research should examine the optimal degree of control to grant consumers, as well as the most relevant type of experience, narrative, emotional, or hybrid. The potential role of advisor avatars, designed to embody luxury codes, also requires exploration. More broadly, the study of digital avatars constitutes a promising field. If consumers are willing to interact with them (Silva & Bonetti, 2021), research should determine their optimal appearance, behavior, language, and role, while measuring their impact on satisfaction, sales, and brand image.

Longitudinal studies are also necessary to evaluate the effects of VR throughout the entire consumer journey, as well as across repeated exposures. A central issue is whether initial enthusiasm is maintained or merely linked to novelty effects that gradually fade. Some authors argue that the novice nature of participants can limit the effectiveness of VR, leading them to focus on novelty rather than content (Anaya-Sánchez et al., 2024), or to underestimate benefits by being absorbed in exploration (Meißner et al., 2020). Conversely, other research in VR stores using encephalographic measures shows that excitement reaches an initial peak before declining, possibly due to the neutralization of novelty when the user forgets the headset and adopts a more conventional mode of interaction (de Regt et al.,

2021). Moreover, *technology readiness* negatively moderates *presence*, *enjoyment*, and participation, as experienced users tend to have higher expectations (Li M. et al., 2024). The decline in perceived benefits due to satiation remains a phenomenon still insufficiently explored (Pala et al., 2022).

Lastly, negative effects and ethical issues constitute a priority area for future inquiry. Research should examine the physical consequences (e.g. visual fatigue, VR sickness) and psychological consequences (e.g. social isolation, cognitive load), as well as risks of addiction or disillusionment with real life, and their broader implications for health, social, and professional life (Anaya-Sánchez et al., 2024 ; Li S. et al., 2024; Petr & Caudan, 2024).

6.3. Limitations

Finally, despite its contributions, this research presents several limitations that should be acknowledged. These concern, first of all, the selection methodology, which was based exclusively on the Scopus database.

In addition, only articles written in English were retained, and the filtering through the HEC Journal Guide led to the inclusion of publications ranked up to grade B. These methodological choices restricted the number of articles selected and may have constrained the scope of the results.

Limitations also arise from the coverage of the literature. Although the keywords were designed to encompass a wide field, they may have inadvertently excluded studies on more specific contexts, such as luxury, VR stores, or niche sectors, that could have further enriched the analysis.

Regarding the nature of the sources, this study relied solely on articles published in peer-reviewed scientific journals. Books, conference proceedings, case studies, and other formats were not included, even though they may have provided complementary insights.

Finally, some limits emerge from the conceptualization of VR itself. While all VR devices and environments were considered, certain conceptualizations also encompass virtual worlds, including the metaverse (fthgfh). This was not included in the scope of the review due to significant conceptual differences with virtual reality, which would have prevented a coherent synthesis of the studies. Yet, the metaverse could exert notable marketing effects, both in product-oriented and experiential contexts, by influencing the consumer–brand relationship through virtual consumption, virtual tourism, or virtual product engagement, while reviving the debate on the complement/substitute relationship in light of the risks of addiction to a controllable reality.

Despite these limitations, in a context of technological evolution where the boundaries between reality and virtuality are progressively fading, this thesis contributes to deepening the understanding of the role, effects, and possibilities offered by VR, while opening avenues for future research. These perspectives aim to better capture and accompany the gradual fusion of the two universes, in the service of a fluid and always real consumer experience.

7. Appendices

7.1. Appendice 1 : List of Articles

N°	Articles	N°	Articles
1	(Bin Kim & Jung Choo, 2023)	**27**	(Silva & Bonetti, 2021)
2	(Schnack, Wright & Holdershaw, 2021)	**28**	(Skard et al., 2021)
3	(de Regt et al., 2021)	**29**	(Branca et al., 2023)
4	(Schnack, Wright & Elms, 2021)	**30**	(Hilken et al., 2022)
5	(Etienne et al., 2023)	**31**	(Farah et al., 2019)
6	(Martínez-Molés et al., 2022)	**32**	(Tussyadiah et al., 2018)
7	(Mkedder et al., 2024)	**33**	(Gastaldello et al., 2024)
8	(Orús et al., 2021)	**34**	(Pizzi et al., 2020)
9	(Zhang et al., 2024)	**35**	(Cowan et al., 2023)
10	(Wen & Leung, 2021)	**36**	(Kim M.J. et al., 2020)
11	(Li S. et al., 2024)	**37**	(Cowan et al., 2021)
12	(van Berlo et al., 2021)	**38**	(Loureiro et al., 2021)
13	(Di Dalmazi et al., 2024)	**39**	(Raza et al., 2024)
14	(Li M. et al., 2024)	**40**	(Zolfagharian & Yazdanparast, 2019)
15	(Yang et al., 2023)	**41**	(Luangrath et al., 2022)
16	(Spielmann & Mantonakis, 2018)	**42**	(Spielmann & Orth, 2021)
17	(Anaya-Sánchez et al., 2024)	**43**	(Meißner et al., 2020)
18	(Pleyers & Poncin, 2020)	**44**	(Han et al., 2020)
19	(Batat, 2024)	**45**	(Mishra et al., 2021)
20	(Aldossary & McLean, 2022)	**46**	(Kim G. et al., 2022)
21	(Alzayat & Lee, 2021)	**47**	(Pala et al., 2022)
22	(Jung et al., 2021)	**48**	(Alyahya & McLean, 2022)
23	(Petr & Caudan, 2024)	**49**	(McLean & Barhorst, 2022)
24	(Lee et al., 2020)	**50**	(Martínez-Navarro et al., 2019)
25	(Wei et al., 2019)	**51**	(Deng et al., 2019)
26	(Sujood & Pancy, 2024)		

**Additional Inclusion*

7.2. Appendice 2 : Environments

Environment	Authors	Technological device	Content type
	Retail		
VR store	*(Schnack, Wright & Elms, 2021)*	HMD	3D
	(Schnack, Wright & Holdershaw, 2021)	HMD	3D
	(Alzayat & Lee, 2021)	HMD	3D
	(Branca et al., 2023)	HMD	3D
	(Loureiro et al., 2021)	HMD	3D
	(Pizzi et al., 2020)	Screen	3D
	(Han et al., 2020)	HMD vs PC Computer	3D
	(Bin Kim & Jung Choo, 2023)	HMD vs PC computer	3D vs 360°
	(Martínez-Navarro et al., 2019)	HMD Vs PC Computer Vs Powerwall	3D vs 360°
	(Mkedder et al., 2024)	/	/
VR product interaction	*(Zhang et al., 2024)*	HMD	3D
	(Luangrath et al., 2022)	HMD	3D
	(Meißner et al., 2020)	HMD vs PC Computer	3D
	(Raza et al., 2024)	/	/
Virtual tour	*(Wen & Leung, 2021)*	HMD	360°
	(Kim G. et al., 2022)	HMD	360°
	(Cowan et al., 2021)	Screen	360°
VR game	*(van Berlo et al., 2021)*	HMD	3D
Virtual fitting room	*(Yang et al., 2023)*	Screen	3D
Digital humans	*(Silva & Bonetti, 2021)*	/	/
/	*(Farah et al., 2019)*	/	/
	Tourism		
Virtual tour	*(Martínez-Molés et al., 2022)*	HMD	3D
	(Di Dalmazi et al., 2024)	HMD	360°
	(Anaya-Sánchez et al., 2024)	HMD	360°
	(Aldossary & McLean, 2022)	HMD	360°
	(Alyahya & McLean, 2022)	HMD	360°
	(Skard et al., 2021)	Mobile VR Headset	360°
	(Tussyadiah et al., 2018)	Mobile VR Headset	360°
	(Lee et al., 2020)	Screen	360°
	(Li S. et al., 2024)	Screen	360°
	(Li M. et al., 2024)	PC Computer	360°
	(Deng et al., 2019)	PC Computer	3D
	(Spielman & Orth, 2021)	PC Computer	360°
	(Orús et al., 2021)	HMD vs Smartphone	3D vs 360°
	(McLean & Barhorst, 2022)	HMD vs PC Computer	3D vs 360°
Virtual tourism	*(Petr & Caudan, 2024)*	/	/
	(Gastaldello et al., 2024)	/	/
VR roller coaster	*(Pala et al., 2022)*	PC Computer	360°
	(Wei et al., 2019)	/	/
VR-related tourism activities	*(Sujood & Pancy, 2024)*	/	/
	(Kim M.J. et al., 2020)	/	/
	Real estate		
Virtual tour	*(Pleyers & Poncin, 2020)*	Screen	360°
	Luxury		
Virtual brand fashion show	*(Jung et al., 2021)*	HMD	360°
	Automobil		
VR marketing campaign	*(de Regt et al., 2021)*	Screen	360°
	Automobil - tourism		
Virtual tour	*(Spielmann & Mantonakis, 2018)*	Screen	360°
	Retail - tourism		
Social Media VR campaign	*(Cowan et al., 2023)*	HMD vs PC computer	3D vs 360°
VR marketing campaign	*(Mishra et al., 2021)*	Mobile VR Headset	360°

7.3. Appendice 3 : Presence Construct 1

Source	Context	Direct Antecedent(s)	P	Consequence(s) (process)	Conséquence (s) (final)
Pre-purchase, experimentation					
de Regt et al. (2022)	Automobile	Narrative interaction	**SP**		Brand advocacy
Martínez-Molés et al. (2022)	Tourism, Cruise	Media richness, interactivity	**P**	(Enjoyment)	Product knowledge, Brand attitude, Purchase intent
Orús et al. (2020)	Hospitality	Factual realism	**P**	Ease of imagination, Visual appeal	Intention to book
Wen & Leung (2021)	Retail, Wine	Video type (VR vs traditionnelle)	**P**	Wine sensory experience (taste, finish)	Wine purchase intention, Willingness to pay
Di Dalmazi et al. (2023)	Tourism, City	Media typology (VR vs 2D)	**P**		Intention to visit, Intention to recommend
Li M. et al. (2024)	Tourism, Museal context	Functional attributes (effectiveness + vividness), Control, Participation, Heightened enjoyment, ~~Curiosity~~	**P**	Original, Interactive, Emotional authenticity	Intention to visit
Spielmann & Mantonakis (2018)	City, Automobile, Hospitality	Interactivity	**P**		Attitude toward the ad
Anaya-Sánchez et al.(2024)	Tourism, City	–	**P**	Experience, Destination image	Intention to visit
Pleyers & Poncin (2020)	Real estate	VR vs static pictures	**P**	Attitude toward property	Intention to visit
Lee et al. (2020)	Tourism, City	Content quality, System quality, Vividness	**P**	Attitude toward VR	Intention to visit
Skard et al. (2021)	Tourism, Nature	VR vs 2D	**P**	Mental imagery, predicted happiness	Behavioral intention
Tussyadiah et al. (2018)	Tourism, City, National park	–	**P**	(Enjoyment), Attitude change	Visit intention
Cowan et al. (2023)	Retail, Champagne, Wine, Automobile	VR vs static website	**P**	Mental imagery, brand attitude	Purchase intention
Spielmann & Orth (2021)	Tourism, Museal context and Hospitality	VR vs static image	**P**	Perceived authenticity, Reduced manipulative intent	Approach behavior
Alyahya & McLean (2022)	Tourism, City	Cognitive processing of mental imagery, quality of mental imagery	**P**	Attitude change toward destination	Visit intention
McLean & Barhorst (2022)	Hospitality	Authentic experience, cognitive processing of mental imagery	**P**	Learning	Visit intention

Pre-purchase/Purchase, VR Store					
Mkedder et al. (2024)	Retail, VR store	E-service quality	**P**	Trust, Shopping Experience, Attitude toward VR store	Satisfaction
Alzayat et al. (2021)	Retail, VR store (Tool Vs clothes)	Retail environment (VR vs Web)	**P**		Hedonic shopping value (NOT utilitarian shopping value)
Pizzi et al. (2020)	Retail, VR store (Grocery)	Store environment, Auditory stimuli	**P**	Shopping experience, Change in perceived value	Patronage intention, WOM intention
Loureiro et al. (2021)	Retail, VR store (Shoes)	Pleasure	**P**		Behavioral intention (intention to use, buy, recommend VR store)
Han et al. (2020)	Retail, VR store (Grocery)	VR Store environnement	**P**	Playfulness	Behavioral intention (continuous visit, purchase intention)
Consumption					
Wei et al. (2019)	Tourism, VR roller coaster	~~Efficacy~~, ~~Efficiency~~, Effectiveness, Vividness, Temporal dissociation, Focused immersion, Heightened enjoyment, Control, ~~Curiosity~~, Participation	**P**		Overall satisfaction, Intention to revisit, recommend
Post-consumption					
McLean & Barhorst (2022)	Hospitality, Virtual tour	Authenticity, Cognitive processing and quality of mental imagery	**P**	Satisfaction with actual hotel appearance	Revisit intention

If crossed out: tested but not confirmed ; In parentheses: mediation can be direct or indirect
P = Presence ; SP = Social Presence

8. List of resource persons

This section presents the resource persons who contributed to the supervision and guidance of this research. Their academic expertise and professional experience have been instrumental in ensuring the scientific rigor and relevance of this work.

Laurence Dessart
Professor of Marketing at HEC Liège, University of Liège.
Laurence Dessart holds a Master's degree in Management Sciences from HEC Liège (awarded with distinction) and a PhD from the Adam Smith Business School, University of Glasgow (United Kingdom). She has previously taught at KEDGE Business School in France before joining HEC Liège. Her teaching and research focus on digital marketing, brand management, and consumer behavior. She has published in leading journals such as the *International Journal of Research in Marketing*, *European Journal of Marketing*, *Journal of Marketing Management*, and the *Journal of Product and Brand Management*. Her current research interests include consumer engagement, storytelling, and the application of virtual reality to marketing.

9. Bibliography and references

Aldossary, M., & McLean, G. (2022). Prolonging the influence of a vacation experience on consumers' wellbeing: Is there a role for virtual reality? *Annals of Tourism Research, 97, 103500.* *https://doi.org/10.1016/j.annals.2022.103500*

Alyahya, M., & McLean, G. (2022). Examining tourism consumers' attitudes and the role of sensory information in virtual reality experiences of a tourist destination. Journal of Travel Research, 61(7), 1666–1681. https://doi.org/10.1177/00472875211037745

Alzayat, A., & Lee, S. H. M. (2021). Virtual products as an extension of my body: Exploring hedonic and utilitarian shopping value in a virtual reality retail environment. Journal of Business Research, 130, 348–363. https://doi.org/10.1016/j.jbusres.2021.03.017

Bin Kim, W., & Jung Choo, H. (2023). How virtual reality shopping experience enhances consumer creativity: The mediating role of perceptual curiosity. Journal of Business Research, 154, 113378. https://doi.org/10.1016/j.jbusres.2022.113378

Branca, G., Resciniti, R., & Loureiro, S. M. C. (2023). Virtual is so real! Consumers' evaluation of product packaging in virtual reality. Psychology & Marketing, 40(3), 596–609. https://doi.org/10.1002/mar.21743

Cowan, K., Ketron, S., Kostyk, A., & Kristofferson, K. (2023). Can you smell the (virtual) roses? The influence of olfactory cues in virtual reality on immersion and positive brand responses. Journal of Retailing, 99(3), 385–399. https://doi.org/10.1016/j.jretai.2023.07.004

Cowan, K., Spielmann, N., Horn, E., & Griffart, C. (2021). Perception is reality… How digital retail environments influence brand perceptions through presence. Journal of Business Research, 123, 86–96. https://doi.org/10.1016/j.jbusres.2020.09.058

de Regt, A., Plangger, K., & Barnes, S. J. (2021). Virtual reality marketing and customer advocacy: Transforming experiences from story-telling to story-doing. Journal of Business Research, 136, 513–522. https://doi.org/10.1016/j.jbusres.2021.08.004

Di Dalmazi, M., Mandolfo, M., Guixeres, J., Alcañiz Raya, M., & Lamberti, L. (2024). How immersive technologies impact behavioral responses in destination marketing: The role of physiological arousal,

presence, and age. International Journal of Contemporary Hospitality Management, 36(11), 3628–3650. https://doi.org/10.1108/IJCHM-09-2023-1511

Etienne, E., Leclercq, A.-L., Remacle, A., Dessart, L., & Schyns, M. (2023). Perception of avatars' nonverbal behaviors in virtual reality. Psychology & Marketing, 40(11), 2464–2481. https://doi.org/10.1002/mar.21871

Farah, M. F., Ramadan, Z. B., & Harb, D. H. (2019). The examination of virtual reality at the intersection of consumer experience, shopping journey and physical retailing. Journal of Retailing and Consumer Services, 48, 136–143. https://doi.org/10.1016/j.jretconser.2019.02.016

Gastaldello, G., Schamel, G., Streletskaya, N., & Rossetto, L. (2024). Uncorking the virtual frontier of wine experiences: Interest drivers and potential consumers' profile. International Journal of Contemporary Hospitality Management, 36(8), 2632–2652. https://doi.org/10.1108/IJCHM-07-2023-1107

Han, S.-L., An, M., Han, J. J., & Lee, J. (2020). Telepresence, time distortion, and consumer traits of virtual reality shopping. Journal of Business Research, 118, 311–320. https://doi.org/10.1016/j.jbusres.2020.06.056

Hilken, T., Chylinski, M., Keeling, D. I., Heller, J., de Ruyter, K., & Mahr, D. (2022). How to strategically choose or combine augmented and virtual reality for improved online experiential retailing. Psychology & Marketing, 39(3), 495–507. https://doi.org/10.1002/mar.21600

Jung, J., Yu, J., Seo, Y., & Ko, E. (2021). Consumer experiences of virtual reality: Insights from VR luxury brand fashion shows. Journal of Business Research, 130, 517–524. https://doi.org/10.1016/j.jbusres.2019.10.038

Kim, G., Jin, B., & Shin, D. C. (2022). Virtual reality as a promotion tool for small independent stores. Journal of Retailing and Consumer Services, 64, 102822. https://doi.org/10.1016/j.jretconser.2021.102822

Kim, M. J., Lee, C.-K., & Jung, T. (2020). Exploring consumer behavior in virtual reality tourism using an extended stimulus–organism–response model. Journal of Travel Research, 59(1), 69–89. https://doi.org/10.1177/0047287518818915

Li, M., Sun, X., Zhu, Y., & Qiu, H. (2024). Real in virtual: The influence mechanism of virtual reality on tourists' perceptions of presence and authenticity in museum tourism. International Journal of

Contemporary Hospitality Management, 36(11), 3651–3673. https://doi.org/10.1108/IJCHM-07-2023-0957

Li, S., Zhu, B., & Yu, Z. (2024). The impact of cue–interaction stimulation on impulse buying intention on virtual reality tourism e-commerce platforms. Journal of Travel Research, 63(5), 1256–1279. https://doi.org/10.1177/00472875231183163

Loureiro, S. M. C., Guerreiro, J., & Japutra, A. (2021). How escapism leads to behavioral intention in a virtual reality store with background music? Journal of Business Research, 134, 288–300. https://doi.org/10.1016/j.jbusres.2021.05.035

Luangrath, A. W., Peck, J., Hedgcock, W., & Xu, Y. (2022). Observing product touch: The vicarious haptic effect in digital marketing and virtual reality. Journal of Marketing Research, 59(2), 306–326. https://doi.org/10.1177/00222437211059540

Martínez-Molés, V., Jung, T. H., Pérez-Cabañero, C., & Cervera-Taulet, A. (2022). Gathering pre-purchase information for a cruise vacation with virtual reality: The effects of media technology and gender. International Journal of Contemporary Hospitality Management, 34(1), 407–429. https://doi.org/10.1108/IJCHM-04-2021-0500

Martínez-Navarro, J., Bigné, E., Guixeres, J., Alcañiz, M., & Torrecilla, C. (2019). The influence of virtual reality in e-commerce. Journal of Business Research, 100, 475–482. https://doi.org/10.1016/j.jbusres.2018.10.054

McLean, G., & Barhorst, J. B. (2022). Living the experience before you go… but did it meet expectations? The role of virtual reality during hotel bookings. Journal of Travel Research, 61(6), 1233–1251. https://doi.org/10.1177/00472875211028313

Meißner, M., Pfeiffer, J., Peukert, C., Dietrich, H., & Pfeiffer, T. (2020). How virtual reality affects consumer choice. Journal of Business Research, 117, 219–231. https://doi.org/10.1016/j.jbusres.2020.06.004

Mishra, A., Shukla, A., Rana, N. P., & Dwivedi, Y. K. (2021). From “touch” to a “multisensory” experience: The impact of technology interface and product type on consumer responses. Psychology & Marketing, 38(3), 385–396. https://doi.org/10.1002/mar.21436

Mkedder, N., Jain, V., & Salunke, P. (2024). Determinants of virtual reality stores influencing purchase intention: An interpretive structural modeling approach. Journal of Retailing and Consumer Services, 78, 103757. https://doi.org/10.1016/j.jretconser.2024.103757

Nayler, R. (2024). La montagne dans la mer [The mountain in the sea]. (Trad. française de H. Planchat). Le Bélial'.

Pala, E., Kapitan, S., & van Esch, P. (2022). Simulated satiation through reality-enhancing technology. Psychology & Marketing, 39(3), 483–494. https://doi.org/10.1002/mar.21582

Pizzi, G., Vannucci, V., & Aiello, G. (2020). Branding in the time of virtual reality: Are virtual store brand perceptions real? Journal of Business Research, 119, 502–510. https://doi.org/10.1016/j.jbusres.2019.11.063

Pleyers, G., & Poncin, I. (2020). Non-immersive virtual reality technologies in real estate: How customer experience drives attitudes toward properties and the service provider. Journal of Retailing and Consumer Services, 57, 102175. https://doi.org/10.1016/j.jretconser.2020.102175

Raza, A., Wasim, M., & Ishaq, M. I. (2024). Virtual reality-based product displays to inspire consumers' purchase intentions: An experimental study. Journal of Business Research, 175, 114540. https://doi.org/10.1016/j.jbusres.2024.114540

Schnack, A., Wright, M. J., & Elms, J. (2021). Investigating the impact of shopper personality on behaviour in immersive virtual reality store environments. Journal of Retailing and Consumer Services, 61, 102581. https://doi.org/10.1016/j.jretconser.2021.102581

Schnack, A., Wright, M. J., & Holdershaw, J. L. (2021). Does the locomotion technique matter in an immersive virtual store environment? – Comparing motion-tracked walking and instant teleportation. Journal of Retailing and Consumer Services, 58, 102266. https://doi.org/10.1016/j.jretconser.2020.102266

Silva, E. S., & Bonetti, F. (2021). Digital humans in fashion: Will consumers interact? Journal of Retailing and Consumer Services, 60, 102430. *https://doi.org/10.1016/j.jretconser.2020.102430*

Skard, S., Knudsen, E. S., Sjåstad, H., & Thorbjørnsen, H. (2021). How virtual reality influences travel intentions: The role of mental imagery and happiness forecasting. Tourism Management, 87, 104360. https://doi.org/10.1016/j.tourman.2021.104360

Spielman, N., & Orth, U. R. (2021). Can advertisers overcome consumer qualms with virtual reality?: Increasing operational transparency through self-guided 360-degree tours. Journal of Advertising Research, 61(2), 147–163. https://doi.org/10.2501/JAR-2020-015

Spielmann, N., & Mantonakis, A. (2018). In virtuo: How user-driven interactivity in virtual tours leads to attitude change. Journal of Business Research, 88, 255–264. https://doi.org/10.1016/j.jbusres.2018.03.037

Sujood, & Pancy. (2024). Travelling with open eyes! A study to measure consumers' intention towards experiencing immersive technologies at tourism destinations by using an integrated model of TPB, TAM captured through the lens of S-O-R. International Journal of Contemporary Hospitality Management, 36(11), 3906–3929. https://doi.org/10.1108/IJCHM-11-2023-1771

Tussyadiah, I. P., Wang, D., Jung, T. H., & tom Dieck, M. C. (2018). Virtual reality, presence, and attitude change: Empirical evidence from tourism. Tourism Management, 66, 140–154. https://doi.org/10.1016/j.tourman.2017.12.003

van Berlo, Z. M. C., van Reijmersdal, E. A., Smit, E. G., & van der Laan, L. N. (2021). Brands in virtual reality games: Affective processes within computer-mediated consumer experiences. Journal of Business Research, 122, 458–465. https://doi.org/10.1016/j.jbusres.2020.09.006

Wei, W., Qi, R., & Zhang, L. (2019). Effects of virtual reality on theme park visitors' experience and behaviors: A presence perspective. Tourism Management, 71, 282–293. https://doi.org/10.1016/j.tourman.2018.10.024

Wen, H., & Leung, X. Y. (2021). Virtual wine tours and wine tasting: The influence of offline and online embodiment integration on wine purchase decisions. Tourism Management, 83, 104250. https://doi.org/10.1016/j.tourman.2020.104250

Deng, X., Unnava, H. R., & Lee, H. (2019). "Too true to be good?" When virtual reality decreases interest in actual reality. Journal of Business Research, 100, 561–570. https://doi.org/10.1016/j.jbusres.2018.11.008

Yang, S., Xiong, G., Mao, H., & Ma, M. (2023). Virtual fitting room effect: Moderating role of body mass index. Journal of Marketing Research, 60(6), 1221–1241. https://doi.org/10.1177/00222437231154871

Zhang, Y., Shao, W., Quach, S., Thaichon, P., & Li, Q. (2024). Examining the moderating effects of shopping orientation, product knowledge and involvement on the effectiveness of virtual reality (VR) retail environment. Journal of Retailing and Consumer Services, 78, 103713. https://doi.org/10.1016/j.jretconser.2024.103713

Zolfagharian, M., & Yazdanparast, A. (2019). Immediacy pandemic: Consumer problem-solving styles and adaptation strategies. European Journal of Marketing, 53(6), 1051–1072. https://doi.org/10.1108/EJM-12-2016-0847

Anaya-Sánchez, R., Rejón-Guardia, F., & Molinillo, S. (2024). Impact of virtual reality experiences on destination image and visit intentions: The moderating effects of immersion, destination familiarity and sickness. International Journal of Contemporary Hospitality Management, 36(?), [pagination à vérifier]. https://doi.org/10.1108/IJCHM-09-2023-1488

Batat, W. (2024). Phygital customer experience in the metaverse: A study of consumer sensory perception of sight, touch, sound, scent, and taste. Journal of Retailing and Consumer Services, 76, 103786. https://doi.org/10.1016/j.jretconser.2024.103786

Lee, M., Lee, S. A., Jeong, M., & Oh, H. (2020). Quality of virtual reality and its impacts on behavioral intention. International Journal of Hospitality Management, 90, 102595. https://doi.org/10.1016/j.ijhm.2020.102595

Orús, C., Ibáñez-Sánchez, S., & Flavián, C. (2021). Enhancing the customer experience with virtual and augmented reality: The impact of content and device type. International Journal of Hospitality Management, 98, 103019. https://doi.org/10.1016/j.ijhm.2021.103019

Petr, C., & Caudan, P. (2024). Ethical marketing framework for metaverse simulated experiences of tourism (SET): An exploration of consumers' aspirations and fears. Journal of Retailing and Consumer Services, 76, 103785. https://doi.org/10.1016/j.jretconser.2024.103785

Anaya-Sánchez, R., Rejón-Guardia, F., & Molinillo, S. (2024). Impact of virtual reality experiences on destination image and visit intentions: The moderating effects of immersion, destination familiarity and sickness. *International Journal of Contemporary Hospitality Management, 36*(11), 3607–3627. https://doi.org/10.1108/IJCHM-09-2023-1488

Batat, W. (2024). Phygital customer experience in the metaverse: A study of consumer sensory perception of sight, touch, sound, scent, and taste. *Journal of Retailing and Consumer Services, 76*, 103786. https://doi.org/10.1016/j.jretconser.2024.103786

Brakus, J. J., Schmitt, B. H., & Zarantonello, L. (2009). Brand experience: What is it? How is it measured? Does it affect loyalty? *Journal of Marketing, 73*(3), 52–68. https://doi.org/10.1509/jmkg.73.3.52

Flavián, C., Ibáñez-Sánchez, S., & Orús, C. (2019). The impact of virtual, augmented and mixed reality technologies on the customer experience. *Journal of Business Research, 100*, 547–560. https://doi.org/10.1016/j.jbusres.2018.10.050

Gilmore, J. H., & Pine, B. J. (2007). *Authenticity: What consumers really want*. Harvard Business Press.

Grewal, D., & Roggeveen, A. L. (2017). The future of retailing. *Journal of Retailing, 93*(1), 1–6. https://doi.org/10.1016/j.jretai.2016.12.008

Hollebeek, L. D., Clark, M. K., Andreassen, T. W., Sigurdsson, V., & Smith, D. (2020). Virtual reality through the customer journey: Framework and propositions. *Journal of Retailing and Consumer Services, 55*, 102056. https://doi.org/10.1016/j.jretconser.2020.102056

Horng, J.-S., Liu, C.-H., Chou, H.-Y., & Tsai, C.-Y. (2012). Understanding the impact of culinary brand equity and destination familiarity on travel intentions. *Tourism Management, 33*(4), 815–824. https://doi.org/10.1016/j.tourman.2011.09.004

Klein, L. R. (2003). Creating virtual product experiences: The role of telepresence. *Journal of Interactive Marketing, 17*(1), 41–55. https://doi.org/10.1002/dir.10046

Krishna, A. (2012). An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior. *Journal of Consumer Psychology, 22*(3), 332–351. https://doi.org/10.1016/j.jcps.2011.08.003

Krishna, A., Lee, S. W., Li, X., & Schwarz, N. (2017). Embodied cognition, sensory marketing, and the conceptualization of consumers' judgment and decision processes: Introduction to the issue. *Journal of the Association for Consumer Research, 2*(4), 377–381. https://doi.org/10.1086/694453

Lee, M., Lee, S. A., Jeong, M., & Oh, H. (2020). Quality of virtual reality and its impacts on behavioral intention. *International Journal of Hospitality Management, 90*, 102595. https://doi.org/10.1016/j.ijhm.2020.102595

MacInnis, D. J., & Price, L. L. (1987). The role of imagery in information processing: Review and extensions. *Journal of Consumer Research, 13*(4), 473–491. http://www.jstor.org/stable/2489369

Miller, D. W., & Stoica, M. (2004). Comparing the effects of a photograph versus artistic renditions of a beach scene in a direct-response print ad for a Caribbean resort island: A mental imagery perspective. *Journal of Vacation Marketing, 10*(1), 11–21. https://doi.org/10.1177/135676670301000102

Mills, S., & Noyes, J. (1999). Virtual reality: An overview of user-related design issues. *Interacting with Computers, 11*(4), 375–386. https://doi.org/10.1016/S0953-5438(98)00057-5

Nelson, R. R., Todd, P. A., & Wixom, B. H. (2005). Antecedents of information and system quality: An empirical examination within the context of data warehousing. *Journal of Management Information Systems, 21*(4), 199–235. https://doi.org/10.1080/07421222.2005.11045823

Nunkoo, R., Shukla, A., & Mishra, A. (2024). The role of temporal distance, conspicuous consumption, and multisensory interfaces on consumer judgments in metaverse. *Journal of Retailing and Consumer Services, 81*, 104037. https://doi.org/10.1016/j.jretconser.2024.104037

Orús, C., Ibáñez-Sánchez, S., & Flavián, C. (2021). Enhancing the customer experience with virtual and augmented reality: The impact of content and device type. *International Journal of Hospitality Management, 98*, 103019. https://doi.org/10.1016/j.ijhm.2021.103019

Petr, C., & Caudan, P. (2024). Ethical marketing framework for metaverse simulated experiences of tourism (SET): An exploration of consumers' aspirations and fears. *Journal of Retailing and Consumer Services, 76*, 103785. https://doi.org/10.1016/j.jretconser.2024.103785

Prahalad, C. K., & Ramaswamy, V. (2004). Co-creation experiences: The next practice in value creation. *Journal of Interactive Marketing, 18*(3), 5–14. https://doi.org/10.1002/dir.20015

Rafaeli, S. (1988). Interactivity: From new media to communication. In R. P. Hawkins, J. M. Wiemann, & S. Pingree (Eds.), *Advancing communication science: Merging mass and interpersonal processes* (pp. 110–134). Sage.

Slater, M. (1999). Measuring presence: A response to the Witmer and Singer presence questionnaire. *Presence: Teleoperators and Virtual Environments, 8*(5), 560–565. https://doi.org/10.1162/105474699566477

Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of Communication, 42*(4), 73–93. https://doi.org/10.1111/j.1460-2466.1992.tb00812.x

Verhoef, P. C., Lemon, K. N., Parasuraman, A., Roggeveen, A., Tsiros, M., & Schlesinger, L. A. (2009). Customer experience creation: Determinants, dynamics and management strategies. *Journal of Retailing, 85*(1), 31–41. https://doi.org/10.1016/j.jretai.2008.11.001

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research, 39*(1), 93–112. https://doi.org/10.1177/0739456X17723971

Xue, L., Parker, C., & Hart, C. (2020). How to design fashion retail's virtual reality platforms. *International Journal of Retail & Distribution Management, 48*(11), 1225–1242. https://doi.org/10.1108/IJRDM-11-2019-0382

Yang, E. C. L., Khoo-Lattimore, C., & Arcodia, C. (2017). A systematic literature review of risk and gender research in tourism. *Tourism Management, 58*, 89–100. https://doi.org/10.1016/j.tourman.2016.10.011

Leveau, P.-H., & Camus, S. (2023). Embodiment, immersion, and enjoyment in virtual reality marketing experiences. *Psychology & Marketing, 40*(7), 1329–1343. https://doi.org/10.1002/mar.21822

Trabelsi-Zoghlami, A., & Touzani, M. (2019). How real are virtual experiences? For a better understanding of virtual experiences and their impact on consumers' real life. *European Journal of Marketing, 53*(8), 1612–1636. https://doi.org/10.1108/EJM-10-2017-0776

10. Research Toolbox

In the course of this research, several digital tools were used to support the writing and linguistic accuracy of the manuscript. Among them:

- **ChatGPT (OpenAI)**: used as a writing assistant for reformulation, stylistic improvement, and clarification of certain passages, while ensuring that no new ideas or references were generated beyond the defined corpus.
- **Reverso**: used as a translation aid for specific terms, section titles, and short passages, in order to ensure terminological precision and consistency between French and English.

These tools were employed exclusively as linguistic support, while the conceptual, analytical, and scientific content remains the sole responsibility of the author.

EXECUTIVE SUMMARY

This thesis investigates the impact of Virtual Reality (VR) on the consumer journey, with a particular focus on the pre-purchase phase. VR is defined as a computer-generated, interactive, three-dimensional environment that induces a sense of immersion and presence. By bridging physical and digital experiences, VR has emerged as a transformative tool for both consumers and marketers.

A systematic literature review was conducted, covering 5,372 initial records retrieved from Scopus. After applying rigorous inclusion and exclusion criteria, 51 articles published between 2018 and 2024 were analyzed. The selected studies span diverse sectors, with retail and tourism/hospitality being the most represented. Technologies examined range from low-immersive screens to highly immersive head-mounted displays (HMDs), with formats including 360° environments and 3D virtual stores.

Findings show that VR enhances consumer experiences by stimulating sensory, cognitive, and affective responses. Mechanisms such as telepresence, interactivity, narrative immersion, and mental imagery significantly influence brand attitudes, purchase intentions, and willingness to pay. VR also fosters hedonic engagement, flow, and brand advocacy, highlighting its strategic value for marketers. However, moderating factors, including technology readiness, prior knowledge, product type, and level of immersiveness, condition the intensity of these effects.

In the pre-purchase stage, VR acts as both a trigger for physical visits (e.g., virtual tours) and a channel for fully virtual transactions (e.g., VR stores). Importantly, consumer behavior in VR environments has demonstrated strong ecological validity, making VR not only a marketing lever but also a robust research tool.

Overall, this thesis demonstrates that VR is reshaping the consumer journey by expanding experiential possibilities and blurring the boundaries between real and virtual consumption. Its strategic integration offers brands a powerful lever to enrich engagement, influence decision-making, and redefine customer experiences.

MOTS-CLÉS/KEYWORDS: VIRTUAL REALITY , CONSUMER EXPERIENCE, VIRTUAL SHOPPING

NOMBRE DE MOTS/WORD COUNT: