

A Systematic Review of Relationship between Virtual Reality & Purchase Behaviour

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Abstract: This study conducts a systematic review to investigate virtual reality's impact on purchase behavior, addressing a critical research gap. Following PRISMA guidelines, this study analyzed 113 scholarly articles from SCOPUS. Using “Antecedents – Consequences - Moderation” framework, the paper synthesizes existing knowledge to explore VR's applications across industries and consumer segments. The study finds that, VR significantly influences consumer purchase behavior, especially among young hedonic consumers. Factors like cost, convenience and VR quality impact VR adoption, while personalized entertainment enhances engagement and sales. The study presents a conceptual framework and outlines future research avenues, emphasizing VR's role in consumer's preferences in brand. This systematic review has practical relevance. Marketers should consider VR to enhance brand engagement and influence consumer behavior. It is highly suggested to create engaging virtual reality (VR) content, customize it to align with audience preferences, and collaborate with VR specialists. Businesses may set themselves apart by creating captivating virtual experiences. The study emphasizes the substantial impact of virtual reality (VR) on customer behavior, underscoring the need of top-notch VR content and partnering with experts in VR marketing. Moreover, it highlights unexplored research prospects and offers practical insights for experts in the sector, underscoring the significant benefits of employing virtual reality technology.

Keywords: Virtual reality, Purchase behaviour, Consumer engagement, Brand perception, Immersive experiences

I. Introduction

In a time characterized by the constant advancement of technology, which greatly influences how customers behave, it is crucial to fully understand and effectively utilize its significant influence. In the middle of the widespread digital revolution, the emergence of Virtual Reality (VR) has offered businesses throughout the world a revolutionary and transforming potential. The integration of immersive technology with commerce has given rise to a novel domain called "Immersive Commerce."

The virtual reality (VR) business is rapidly growing, and it is projected to increase in value from \$27 billion in 2018 to an astonishing \$209.2 billion by 2022, according to Meißner et al. (2018). Virtual Reality (VR) provides clients with exceptional telepresence capabilities, allowing them to explore and engage with virtual destinations. This has the potential to replace real travel within the tourist industry (Lee et al., 2023). In the field of consumer-packaged products and supermarket shopping, the use of 3D virtual stores has been extremely beneficial for conducting research and gaining a better understanding of consumer behavior (van Herpen et al., 2016).

Furthermore, the deeply engaging quality of virtual reality technology has the capacity to transform consumer experiences. As customers interact more and more with virtual worlds, a crucial question emerges: What is the influence of Virtual Reality on consumer buying patterns? This systematic review explores the intricate area of virtual experiences to thoroughly examine the notion of Immersive Commerce and its unexplored aspects. This exploration aims to elucidate the significant impact that VR has on both businesses and consumers.

The current body of knowledge

In recent times, there has been a notable increase in scholarly attention towards the concept of immersive commerce. This is mostly due to a combination of causes, including developments in technology, changes in consumer preferences, and worldwide events like the COVID-19 epidemic. Fashion retailers, specifically, have encountered the formidable task of adjusting to this swiftly evolving environment. Historically, these merchants heavily depended on brick-and-mortar businesses located in prominent commercial areas and implemented well-defined business tactics to entice customers (Xue et al., 2019).

The COVID-19 pandemic has had an exceptional influence on the worldwide economy, hastening the transition to online commerce, particularly in non-essential industries such as fashion (Xue et al., 2019). E-commerce, encompassing both conventional online shopping and virtual commerce (v-commerce), provides consumers with a wide range of advantages, including convenience, competitive pricing, a vast selection of products, personalized attention, and access to detailed information such as product reviews, which greatly impact their buying choices (Xue et al., 2019).

Virtual reality (VR) and immersive technologies enhance customer experiences by allowing them to navigate and engage with virtual environments. This feature promotes a stronger feeling of being present and greatly enhances involvement (Lee et al., 2023). The efficacy of these technologies as commercial tools is apparent from the significant investments made by large firms such as Alibaba, Macy's, and IKEA in virtual reality (VR) shopping applications (Meißner et al., 2018). Virtual Reality (VR) enables consumers to engage with products and environments in ways that beyond the constraints of conventional two-

dimensional screens (Pizzi et al., 2019). Recently, companies such as Coca-Cola and McDonald's have implemented virtual reality (VR) technology to improve their connections with consumers (Hollebeek et al., 2019).

Immersive commerce has a wide-ranging influence on customer purchasing behavior that goes beyond only the retail sector. Tussyadiah et al. (2019) argue that virtual reality (VR) technology has the ability to accurately recreate genuine experiences and destinations in the tourist sector. This presents a possible solution for effectively handling the number of visitors and safeguarding the authenticity of natural and cultural heritage sites. Virtual reality wine tours in the field of wine tourism enable consumers to virtually navigate vineyards and wineries, fostering a sense of connection with their preferred wine places (Wen et al., 2023). Academics highlight the increasing significance of virtual reality (VR) in several industries. Slevitch et al. (2022) emphasize the substantial impact of virtual reality (VR) in the hotel and tourism sector, specifically its capacity to alter decision-making before making a purchase by providing immersive visual experiences.

The scope of immersive commerce stretches well beyond conventional shopping. Tussyadiah et al. (2019) observe that virtual reality (VR) has the ability to accurately recreate experiences and locations in the field of tourism. This technology offers potential solutions for managing visitors and preserving heritage. Furthermore, in the context of wine tourism, virtual reality (VR) wine tours allow individuals to virtually explore vineyards, establishing relationships with cherished destinations (Wen et al., 2023). Academics continually emphasize the growing significance of virtual reality (VR) in various sectors.

Branca, Resciniti, and Loureiro (2022) emphasized the significance of virtual reality (VR) as a prominent technical trend that is propelling the process of digitalization. However, they also highlighted a dearth of consensus within the VR marketing literature pertaining to consumers' perceptions and interactions with this dynamic technology. Drawing upon the existing body of literature, our comprehensive review will explore the following research inquiries (refer to Table 3):

1. What are the primary elements that precede, moderate, and result from the adoption of Virtual Reality (VR) for immersive commerce, and how do they collectively impact consumer purchasing behaviour in various industries and contexts?
2. What are the variations in consumer perceptions and engagement with virtual reality (VR) technology across different industries, and what are the elements that shape these perceptions?

Through a comprehensive examination of the current body of knowledge and the identification of potential areas for additional exploration, our objective is to provide significant insights that can inform future research agendas. Additionally, our findings seek to aid businesses and marketers in efficiently leveraging virtual reality (VR) within their plans.

II. Methodology

The PRISMA model, known as the Preferred Reporting Items for Systematic Reviews and Meta-Analyses, is a well-recognized and strongly endorsed methodology for conducting and documenting systematic literature reviews. By employing a systematic methodology, the review process is characterized by transparency, rigor, and reproducibility (Moher et al., 2015). This comprehensive study explores the detailed aspects that explain the influence of virtual reality on consumer behavior in many contexts and businesses. It employs the PRISMA model, which is a systematic and rigorous method (see Figure 1). The objective of the study was to examine the current body of literature on this topic and suggest relevant areas for future investigation. Taufik et al. (2021) established the efficacy of virtual reality (VR) tools in influencing customer behavior through rigorous experimental research. In contrast to Taufik et al. (2021), this systematic literature review contains a wide range of investigations, incorporating both quantitative and qualitative research publications, as well as experimental studies. During the preliminary stage of this systematic literature review, an extensive search was carried out to uncover pertinent research investigating the correlation between consumer behaviour and immersive technologies, specifically virtual reality (VR) and augmented reality (AR). The search criteria utilized during this phase consisted of a precise search string (refer to Table 1). The investigation was conducted using the Scopus database, leading to the discovery of a total of 292 documents. The selection of these records was based on the pertinence of their titles, abstracts, keywords, and author information to the research subject.

A total of 179 records were eliminated from consideration during the pre-screening procedure, as per the precise criteria outlined in Table 2. The aforementioned records were deemed ineligible due to their failure to satisfy the following criteria: they were not written in the English language, were not in their final stage (e.g., preliminary research or drafts), did not adhere to the format typically found in academic journals, were not classified as articles, and did not pertain to the disciplines of business management, social science, or psychology. Furthermore, it is important to note that no instances of duplicate records were detected and subsequently eliminated throughout the screening process in this particular phase.

During the screening phase of the systematic literature review, a comprehensive evaluation was conducted on a total of 113 records to determine their relevance to the research topic and aims. A total of 71 publications were omitted from the analysis due to their lack of relevance, as determined through a comprehensive examination of their abstracts, and their failure to meet the predetermined inclusion criteria. Out of an initial selection, 42 articles were identified as potentially noteworthy and deserving of further examination and assessment. Curiously, three of these publications were not available for thorough assessment. Hence, a thorough examination was conducted on the remaining 39 papers to evaluate their substance and pertinence to the research

objectives. This compilation of 39 publications serves as the foundation for the thorough analysis and integration of the current literature carried out in this study.

III. Presenting findings.

Overall Analysis

The systematic literature study collected data from 2009 to 2023, covering a duration of 15 years. This extensive investigation examined 39 documents obtained from a wide range of 27 sources, including multiple scholarly periodicals. The yearly increase in the number of documents in this specific field has been determined to be 12.18%, which is a noteworthy indication of the growing scholarly interest in understanding the complex connection between Virtual Reality (VR) and consumer purchasing patterns.

The average age of the documents was 2.56 years, indicating the dynamic and developing nature of this research field. The documents in question were collectively created by a group of 131 individuals, with the exception of a solitary document that was authored by a sole individual. Collaboration emerged as a salient characteristic, as evidenced by an average of 3.49 co-authors per document, thereby highlighting the collaborative essence of research within this particular domain. From 2009 to 2013, there was a notable absence of scholarly engagement in this particular field, as seen by the absence of any published articles throughout this time period (refer to Figure 2). From 2014 onwards, there was a progressive augmentation in research productivity, characterized by the publication of one article annually till 2019. A noteworthy observation is that there has been a substantial increase in study interest about virtual reality (VR) and its correlation with consumer purchasing behaviour, commencing from the year 2020. In the year 2020, there was a notable rise in the quantity of articles, reaching a total of 8. This increase signifies a rising acknowledgment of the potential influence of virtual reality (VR) on consumer behaviour, particularly in the realm of online buying and marketing. The aforementioned pattern shown a progressive increase in succeeding years, as seen by the publication of 9 articles in 2021, 11 articles in 2022, and 5 articles in 2023. While analysing the country wise publication data, we found that VR related articles are predominantly produced by western countries which signifies massive development opportunity of VR related activities in eastern world (See Table 5). It was witnessed that the "Journal of Business Research" emerged as the most notable publication in this field, with a total of four articles dedicated to the subject. This finding was derived by considering just those journals that had a minimum of two publications, with seven journals accounting for 50% of the articles. The three academic journals that have made significant contributions in their respective fields are "Computers in Human Behaviour," "Frontiers in Psychology," and "Tourism Management."

Organizations

The five major themes and elements, as presented in Table 9, have been derived from existing scholarly research on virtual reality (VR) and consumer behaviour. These themes and factors present significant prospects and obstacles that warrant careful consideration. Although social media platforms offer businesses the opportunity to effectively communicate with consumers and improve their marketing strategies, they also pose challenges in terms of limited resources, technology implementation, ethical implications, and contextual appropriateness. The consideration of various themes and factors will be crucial for businesses aiming to leverage the potential of virtual reality (VR) in the domains of consumer behaviour and marketing (Martínez-Molés et al., 2021; Loureiro, Correia, & Guerreiro, 2022; Khatri et al., 2022; Zhou et al., 2023), as VR continues to advance and develop.

IV. Analysis & Findings

Antecedents:

The influence of antecedents on customer behaviour inside the realm of Virtual Reality (VR) and immersive experiences is of significant importance. Multiple studies have elucidated critical aspects that exert an influence on consumer reactions towards virtual reality (VR) technologies (refer to Table 9 and Figure 6).

Liangchao Xue et al. (2020) emphasize the importance of V-commerce design, highlighting the requirement for higher quality content in comparison to traditional physical merchants. Additionally, they emphasize the significance of hedonic customers, specifically individuals between the ages of 18 and 34, who have a strong inclination towards V-commerce. This finding provides insight into the demographic intricacies of customer behavior. Moreover, the expense associated with virtual reality (VR) technology, encompassing both headsets and computer systems, arises as a noteworthy factor for consumers to take into account.

According to Lee et al. (2020), the importance of VR content quality cannot be overstated as it plays a vital role in motivating visitors to participate in virtual exploration. Their study underscores the significance of vividness in virtual reality (VR) and its influence on users' attitudes and behavioral intentions, emphasizing the utmost necessity of content quality in immersive experiences. Meißner et al. (2020) investigate the impact of highly immersive virtual reality (VR) environments on consumer choice behavior, highlighting their ability to potentially disrupt conventional decision-making processes. They identify variety-seeking and price-sensitivity as crucial characteristics in automated virtual environments, offering valuable insights into the convergence of consumer choices and virtual reality.

Lombart et al. (2020) investigate the influence of virtual reality (VR) technology on customer perceptions, specifically in relation to the perceived healthiness and hedonic aspects of products. They highlight the significance of cues such as cost in the

assessment of products inside immersive virtual retail environments. Alexander Schnack et al. (2020) emphasize the significance of the quality of virtual reality (VR) experiences. They discovered that greater immersion in VR considerably improves the sense of escaping from reality and happiness, which in turn affects how consumers perceive products and their purchase efficiency.

Lavoie et al. (2020) acknowledge the commercial uses of VR technology as an important factor, highlighting its influence on the development of consumer identity and its ability to shape consumer behavior. These previous occurrences collectively enhance our comprehension of the impact of virtual reality on consumer behavior, encompassing aspects such as the quality of the material, the level of immersion, decision-making patterns, the adoption of technology, and the formation of consumer identity.

According to Harz, Hohenberg, and Homburg (2021), virtual reality (VR) simulations conducted in controlled laboratory settings can reliably and really influence consumer behavior, hence improving the accuracy of predictions made before a product's introduction. Slevitch et al. (2022) discovered that there are no noteworthy disparities in customer responses when comparing static photos to immersive 360° VR images in hotel marketing. This implies that the impact of these images is restricted in this particular setting. Branca, Resciniti, and Loureiro (2022) establish the trustworthiness of virtual reality (VR) in the context of product testing and prototyping by emphasizing the agreement between VR evaluations and real-world evaluations of items.

In their study, Lee, Lee, and Jeong (2021) highlight the significance of vividness and engagement in virtual reality (VR) applications to enhance information-seeking and sharing behaviors. In their study, Yan et al. (2022) present a theoretical framework that emphasizes the importance of genuine experiences in fostering customer loyalty in services that utilize virtual reality technology. This paradigm proposes that authenticity acts as a mediator for the impact of enjoyment, emotional involvement, and flow on loyalty.

Consequences

The extensive implications of Virtual Reality (VR) technology have a significant impact on different aspects of consumer behavior and marketing, as outlined in Table 9 and Figure 6. MinuteThe user did not provide any text. According to Woo Lee et al. (2020), VR has a significant impact on people's attitudes, intentions to act, and preferences for destinations. VR is widely acknowledged as a powerful force that significantly affects how users respond to marketing messages. It has a significant impact on destination marketing strategies.

Meißner et al. (2020) elucidate the consequences of high-immersive virtual reality (VR) environments, namely their influence on consumer decision-making. They emphasize the revolutionary capacity of automated virtual environments in consumer research, which has the ability to fundamentally alter decision-making frameworks. Lombart et al. (2020) discuss the effects of virtual reality (VR) on consumer behavior, how it influences how products are perceived and evaluated, and how it can be used as an important tool in product marketing.

Schnack et al. (2020) provide evidence that immersive virtual reality (VR) experiences lead to several positive results, including strengthening consumer perceptions, promoting escapism, and improving shopping efficiency. These studies emphasize the positive impacts of immersive virtual reality on consumer behavior. In addition, Zeng, Xing, and Jin (2023) emphasize the importance of virtual reality (VR) and augmented reality (AR) in developing strong relationships between consumers and brands, which ultimately leads to increased satisfaction and purchase intentions.

Azmi et al. (2021) argue that virtual reality (VR) has the ability to impact user behavior in real estate marketing. They support this claim by pointing out that there are no significant differences in arousal emotion between physical and virtual settings. Khatri et al. (2022) examines consumer behavior in virtual retail environments, using signals like eye movements and behavior tracking to categorize customers according to specific personality traits. Their discoveries provide significant contributions to the field of consumer behavior research, opening up opportunities for more investigations in the future.

The study conducted by Martínez-Molés et al. (2021) provides evidence that non-immersive virtual reality (VR) improves consumer learning in virtual cruise holiday scenarios, leading to a positive impact on product comprehension, brand perception, and decision-making. The study conducted by Loureiro, Correia, and Guerreiro (2022) found that customer engagement and the level of realism experienced in a virtual reality furniture store have a substantial influence on utilitarian and hedonic perceptions, behavioral intentions, and purchase decisions.

Moderating Factors:

An essential aspect of understanding the effects of Virtual Reality (VR) experiences on customer behavior and marketing is the examination of moderating themes. This analysis is crucial for interpreting the results, as presented in Table 9 and Figure 6. Lee et al. (2020) emphasize the crucial significance of VR content quality and vividness as elements that moderate the impact they have on user perceptions and behavioral intentions, particularly in the context of destination marketing. Meißner et al. (2020) emphasize the importance of immersive virtual reality (VR) environments as powerful factors that can influence consumer decision-making habits.

In their study, Cindy Lombart and her colleagues (2020) emphasize the significant impact of VR technology on consumer perceptions and product evaluations, leading to notable changes in consumer patterns. Schnack et al. (2020) elucidated the

significant influence of immersive virtual reality (VR) experience quality on consumer attitudes and purchase effectiveness within VR environments.

In addition, several research explore other moderating elements that go beyond consumer behavior and marketing domains. Jung et al. (2021) highlight the significance of cultural discourses and ontological characteristics in molding consumer experiences in virtual reality (VR), emphasizing their impact on the user's process of creating meaning. Han et al. (2022) examine how contextual factors affect the level of acceptance of food in immersive virtual reality (VR) settings, highlighting the significance of suitable context in influencing individuals' sensory experiences of food items.

In this study, Zhou et al. (2023) investigate how the design features of virtual reality (VR) affect customers' desire to customize products. They find that the aesthetics, functionality, and symbolism of VR design have a substantial impact on consumers' motivation to customize, and this relationship is influenced by the customers' readiness to adopt technology. In this study, Wen et al. (2023) investigate the effects of exterior design on virtual stores. They discover that the decisions made in store exterior design, such as whether to use opaque or transparent materials, have a substantial effect on consumer purchase intent. This highlights the importance of visual signals in shaping consumer responses in virtual reality (VR) environments.

Wang et al. (2020) examine how signals from virtual reality (VR) and physical settings might be used to influence sensory assessments, specifically in the evaluation of creaminess in black coffee.

V. Management Implications

The deep implications for managers, especially in the fields of business and marketing, are derived from the comprehensive analysis of existing research. Enterprises seeking a competitive advantage must strategically use virtual reality (VR) technology that is customized to their industry's unique circumstances. Virtual reality (VR) has great potential to enhance consumer engagement, promote stronger brand loyalty through immersive experiences, and strengthen connections between customers and brands. This can enhance the market position of firms and contribute to long-lasting customer value.

Furthermore, it is essential to recognize and confront perceived dangers, particularly in the field of digital entrepreneurship, where uncertainties are significant. Virtual reality (VR) can be used as a technique to build trust, alleviate consumer concerns, and establish strong positions in the market. Moreover, it is crucial to acknowledge the significant capacity for customization and personalization inside virtual reality environments. Customizing products and services to suit individual interests can foster increased consumer happiness and loyalty, particularly in sectors such as cultural tourism and retail.

Data-driven decision-making is of crucial significance in this context. Given the substantial amount of consumer behavior data being generated by VR platforms, it is wise for enterprises to allocate resources towards the development of analytics capabilities. This will enable them to get significant insights, which can subsequently be utilized to influence marketing strategies and enhance product offerings efficiently.

By proactively adopting VR technology, addressing perceived dangers, taking advantage of customisation opportunities, and utilizing consumer behavior data for informed decision-making, firms may position themselves for long-term success in a highly competitive market.

VI. Conclusion

This comprehensive literature study thoroughly examines the relationship between virtual reality (VR) and customer buying behavior in various industries and during different time periods. The study thoroughly analyzes three crucial elements of this relationship: precursors, moderating variables, and consequences, providing useful insights into the impact of VR technology on consumer behavior.

Individual preferences have a significant role in influencing how consumers perceive and interact with virtual environments, ultimately guiding their purchasing choices. Nevertheless, the influence of virtual reality (VR) goes beyond the purchasing habits of individuals, reaching into wider domains of consumer interaction and commitment.

The influence of virtual reality (VR) technology on consumer buying habits is significant and extensive across several sectors. In domains characterized by enjoyment and the pursuit of pleasure, such as virtual reality gaming, the captivating and all-encompassing nature of VR enhances delightful experiences, leading users to engage in the acquisition of in-game items and consequently strengthening sources of income.

Furthermore, the adoption of virtual reality (VR) technology by large companies highlights its importance in transforming business models, including marketing strategies and sales techniques, so redefining interactions between businesses and customers (B2C) as well as between businesses (B2B). Additionally, research has demonstrated that VR brand campaigns have the capacity to foster more sophisticated levels of engagement between consumers and brands, achieved through the establishment of social presence and narrative interaction (Ameen et al., 2023).

Future Research Agendas

The field of research concerning the intersection of Virtual Reality (VR) and consumer behaviour is anticipated to see significant expansion in the coming years, propelled by the emergence of several trends (refer to Table 10 and Figure 4). The research agenda

will increasingly prioritize the examination of gender inclusion and diversity within virtual reality (VR) experiences, with the aim of accommodating a broad range of preferences. Age-specific research studies will investigate the manner in which various generational cohorts, ranging from Generation Z to Baby Boomers, interact with virtual reality (VR) technology and formulate their purchasing choices. The potential of virtual reality (VR) in transforming the tourist industry is a significant study topic that has the capacity to reshape travel experiences. The significance of gender-responsive marketing techniques is expected to increase, as there is a growing emphasis on adapting virtual reality (VR) experiences to cater to the varied identities of consumers. Interdisciplinary collaborations are anticipated to yield novel discoveries, with a continued emphasis on ethical considerations, health applications, and the integration of artificial intelligence (AI) in the forefront.

Conflict of Interest Statement

The author certifies that the author has neither affiliations with nor involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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Table 1 (Search criteria)

Identification Date: 04-08-2023 TITLE-ABS-KEY-AUTH (("virtual reality" OR vr) AND ("consumer behavio*" OR "purchase behavio*" OR "purchase intention") AND (relat* OR impact OR effect)) Screening TITLE-ABS-KEY-AUTH (("virtual reality" OR vr) AND ("consumer behavio*" OR "purchase behavio*" OR "purchase intention") AND (relat* OR impact OR effect)) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "PSYC")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE , "English"))

Source: The Author

Table 2 (Exclusion criteria)

Code	Explanation	Exclude if
Duplicate	Article is a duplicate of an article encountered above	Scopus and Web of Science have different ways of dealing with special characters (o etc.).
Lookup	Article does not provide an abstract	No exclusion – but end of coding at this stage as we have agreed not to judge on title alone
No English	Abstract/article is not in English	Abstract is not in English
No results	Abstract/article does not have results yet	Abstract/article does not have results yet and only describes why the study is interesting and how it would contribute
No VR study	No VR studies are reported in paper	Exclude papers in which no VR study is reported: We define VR as all experiments that use virtual reality or VR in their experiment or paper description
No behavioural outcome measure	No behavioural outcome measure(s) are reported in paper	Exclude papers in which no behavioural outcomes are reported. Examples of non-behavioural outcome measures are: Attitudes & opinions, Perceptions. Include papers that focus on for instance: Choice, Sales, Objective measures, Preferences, Behavioural intention. All forms of behaviour that ultimately include a form of monetary expenditures
No consumer study	The reference is outside the domain of consumer studies on the behavioural outcome(s) cannot be established	Exclude the following papers: Medical (i.e., effect of food on human physiology) and nutritional papers, Papers on animal subjects
No access to full paper	When there is no (free) access to the full paper	
Include	Everything not excluded based on above	

Source: The Author

Table 3 (Research gap in extant literature)

Authors (Year)	Identified Research Gap
Nathalie Harz; Sebastian Hohenberg; Christian Homburg (2022)	VR's impact on new product development in consumer durables - Limited exploration of consumer attitudes towards VR in NPd
Lisa Slevitch; Tilanka Chandrasekera; Luis Mejia-Puig; Kate Korneva; Josephine S. Akosa (2022)	VR's influence on hospitality and tourism experiences - Lack of in-depth examination of negative aspects of VR usage
Generoso Branca; Riccardo Resciniti; Sandra Loureiro (2022)	The role of VR in marketing and advertising - Incomplete understanding of the factors affecting VR effectiveness
Seonjeong (Ally) Lee; Min-Woo Lee; Miyoung Jeong (2021)	VR's application in enhancing consumer engagement - Scarcity of research on conditions impacting VR efficacy
Jun Yan; Ihtesham Ali; Rizwan Ali; Yaping Chang (2022)	VR as a tool for cultural tourism - Limited investigation into consumer perceptions of VR technology
Sandra Loureiro; Carolina N. Correia; João Farias Guerreiro (2022)	Customization through VR in marketing - Lack of research on the potential drawbacks of VR adoption
Xi Han; Feng Wang; Shengxiang Lv; Wenting Han (2021)	The rise of VR in the food industry - Insufficient exploration of factors contributing to VR's impact
Graeme McLean; Jennifer B. Barhorst (2021)	VR's role in enhancing the shopping experience - A need for a comprehensive analysis of consumer responses to VR
Taufik, Kunz, Onwezen (2021)	Need for comprehensive investigations beyond the food domain.
Valinatajbahnamiri, Siahtiri (2021)	Explore VR's influence on consumer behaviour.
Lyu, Krasnikolakis, Vrontis (2022)	Investigate VR's effects on consumer decisions in retail.
Branca, Marino, Resciniti (2023)	Study consumer perceptions when evaluating products in VR.

Source: The Author

Table 4 (Context in extant literatures)

Author(s)	Year	Industrial Context
Liangchao Xue; Chris Parker; Cathryn A. Hart	2020	Fashion retail and v-commerce
Min-Woo Lee; Seonjeong (Ally) Lee; Miyoung Jeong; Haemoon Oh	2020	Tourism and destination marketing
Martin Meißner; Jella Pfeiffer; Christian Peukert; Holger Dietrich; Thies Pfeiffer	2020	Consumer choice behaviour and VR in marketing
Cindy Lombart; Elena Millan; Jean-Marie Normand; Adrien Verhulst; Blandine Labbé-Pinlon; Guillaume Moreau	2020	Retailing and perceptions of fruits and vegetables
Alexander Schnack; Malcolm Wright; Judith Holdershaw	2020	Shopper research and immersive VR
Raymond Lavoie; Corey King	2020	Influence of VR on consumer spending and experiences
Gabriele Pizzi; Daniele Scarpi; Marco Pichierri; Virginia Vannucci	2019	Consumer shopping orientations and VR
Iis P. Tussyadiah; Dan Wang; Timothy Jung; M. Claudia tom Dieck	2018	Tourism and destination marketing with VR
Erica van Herpen; Eva M. F. Van den Broek; Hans C.M. van Trijp; Tian Yu	2016	Grocery shopping behaviour and VR
Joseph Ben-Ur; Enping (Shirley) Mai; Jun Yang	2015	Pleasure and hedonic consumption in virtual reality games

Paweł Dobrowolski; Grzegorz Pochwatko; Maciek Skorko; Maksymilian Bielecki	2014	Consumer experience in 3D virtual environments
Linda D. Hollebeek; Moira Clark; Tor W. Andreassen; Valdimar Sigurdsson; Dale Smith	2020	Adoption of VR by leading companies
Sihem Ben Saad; Fatma Choura	2022	Perceived risk and VR technology in digital entrepreneurship
Anouk de Regt; Kirk Plangger; Stuart J. Barnes	2021	Customer brand engagement in VR brand campaigns
Nisreen Ameen; Sameer Hosany; Ali Tarhini	2021	Consumer interaction with cutting-edge technologies
Adam P. Vrechopoulos; Konstantina Apostolou; Vasilios Koutsouris	2009	Virtual reality retail store layout
Nannan Xi; Juho Hamari	2021	VR technology used by Gen-Z during the Covid-19 pandemic
Han Wen; Xi Y. Leung	2021	Influence of VR on wine sensory experience and purchasing
Nathalie Harz; Sebastian Hohenberg; Christian Homburg	2022	Consumer Durables
Lisa Slevitch; Tilanka Chandrasekera; Luis Mejia-Puig; Kate Korneva; Josephine S. Akosa	2022	Hospitality and Tourism
Generoso Branca; Riccardo Resciniti; Sandra Loureiro	2022	Business and Market Research
Seonjeong (Ally) Lee; Min-Woo Lee; Miyoung Jeong	2021	Service Firms
Jun Yan; Ihtesham Ali; Rizwan Ali; Yaping Chang	2022	Customer Loyalty and Affective Responses
Jing-Yun Zeng; Yisitie Xing; Chang-Hyun Jin	2023	Consumer-Brand Relationships
Athira Azmi; Rahinah Ibrahim; Maszura Abdul Ghafar; Alimorad Rashidi	2021	Industrial Revolution 4.0 and Global Organizations
Jaikishan Khatri; Javier Marín-Morales; Masoud Moghaddasi; Jaime Guixeres; Irene Alice Chicchi Giglioli; Mariano Alcañiz	2022	Residential VR and User-Centeredness
Sandra Loureiro; Carolina N. Correia; João Farias Guerreiro	2022	Consumer Behaviour in VR Retail Environments
Siv Skard; Eirik Sjøholm Knudsen; Hallgeir Sjøstad; Helge Thorbjørnsen	2021	Hotel-Related VR Learning Experiences
Xiao Song; Federico J.A. Perez-Cueto; Wender L.P. Bredie	2022	Cultural Tourism
Fei Zhou; Na Zhang; Na Wang; Jian Mou	2023	Customer Customization in VR
Jaesuk Jung; Jihye Yu; Yuri Seo; Eunju Ko	2021	Consumer Experiences in VR and Socio-Cultural Discourses
Qian Wang; Rachel S. Meyer; Stuart Waters; David Zandle	2020	Food Perception in VR

Source: The Author

Table 5 (County wise yearly publications)

	Year									
Countries	2009	2014	2015	2016	2018	2019	2020	2021	2022	2023
CHINA	0	0	0	0	0	0	0	2	4	5
DENMARK	0	0	0	0	0	0	1	1	2	2

FRANCE	0	0	0	0	0	0	2	2	2	2
ITALY	0	0	0	0	0	1	1	1	1	2
KOREA	0	0	0	0	0	0	0	1	2	4
UNITED KINGDOM	0	0	0	0	1	1	2	4	6	6
USA	0	0	1	1	1	1	3	7	8	8
Grand Total	0	0	1	1	2	3	9	18	25	29

Source: The Author

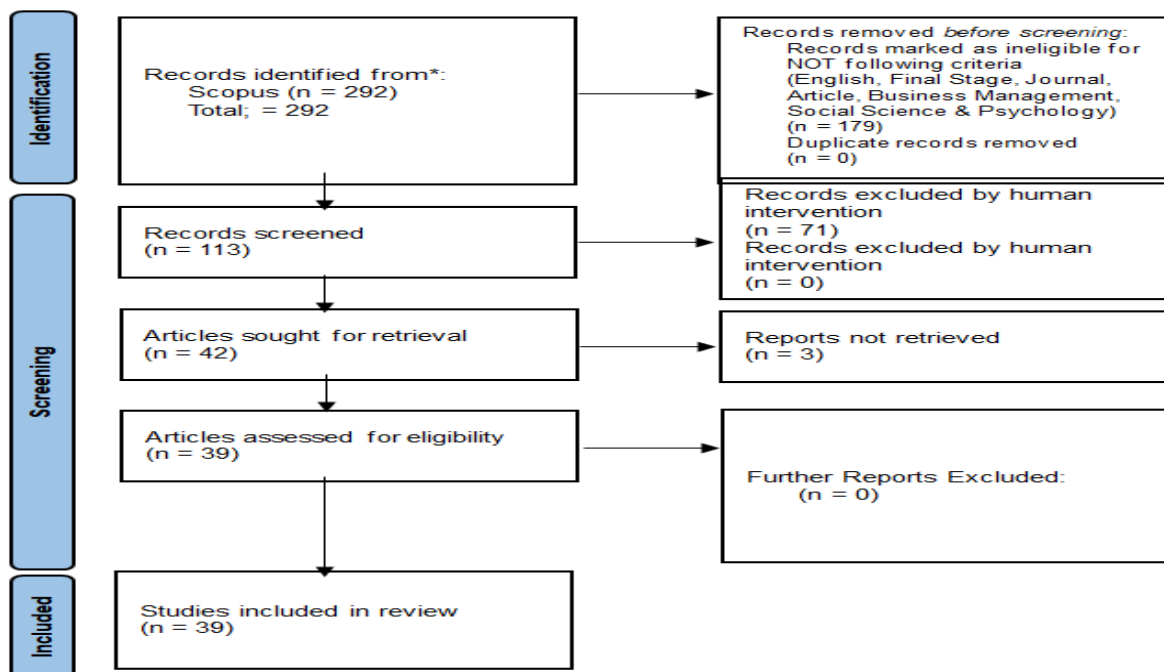


Figure 1 (PRISMA Protocol)

Source: The Author

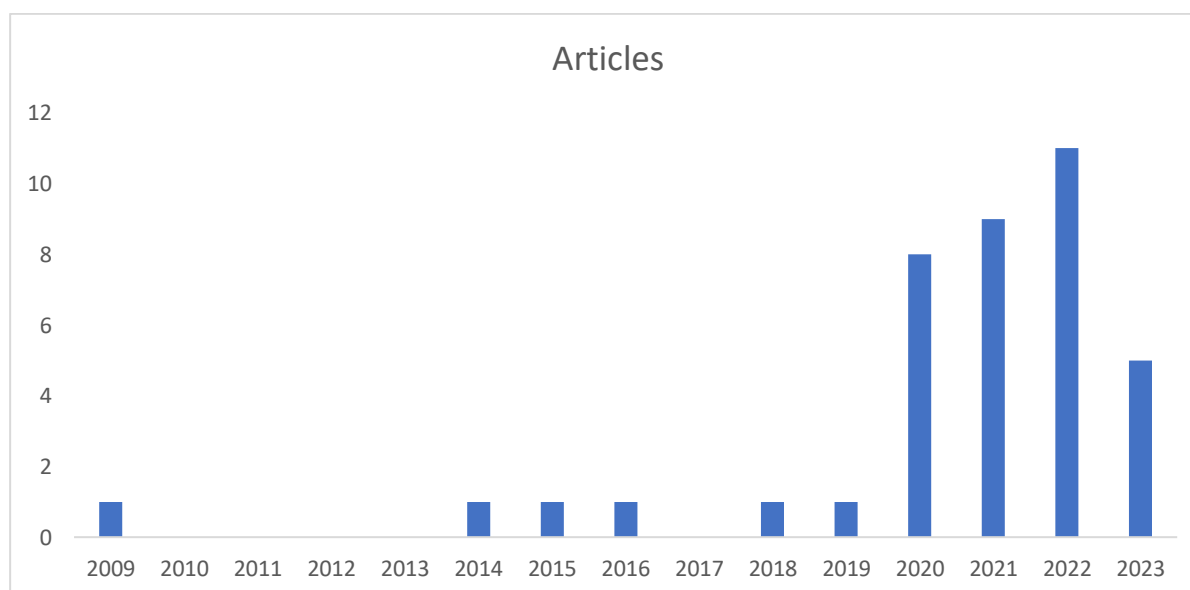


Figure 2 (Year wise publication counts)

Source: The Author

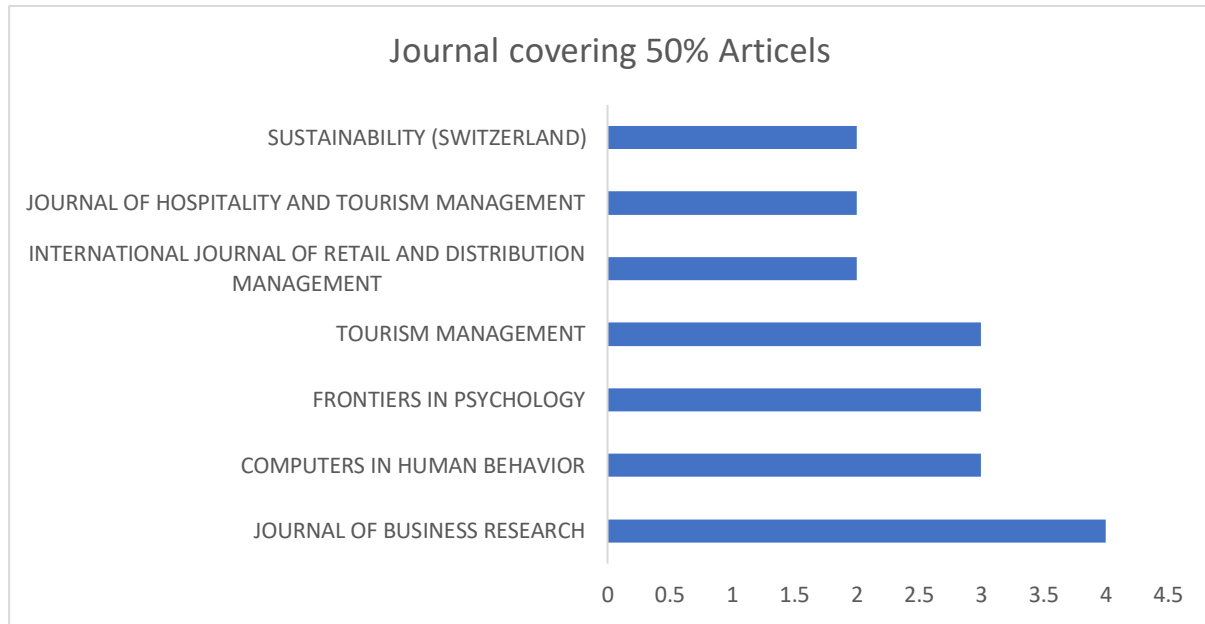


Figure 3 (Journal wise publication counts)

Source: The Author

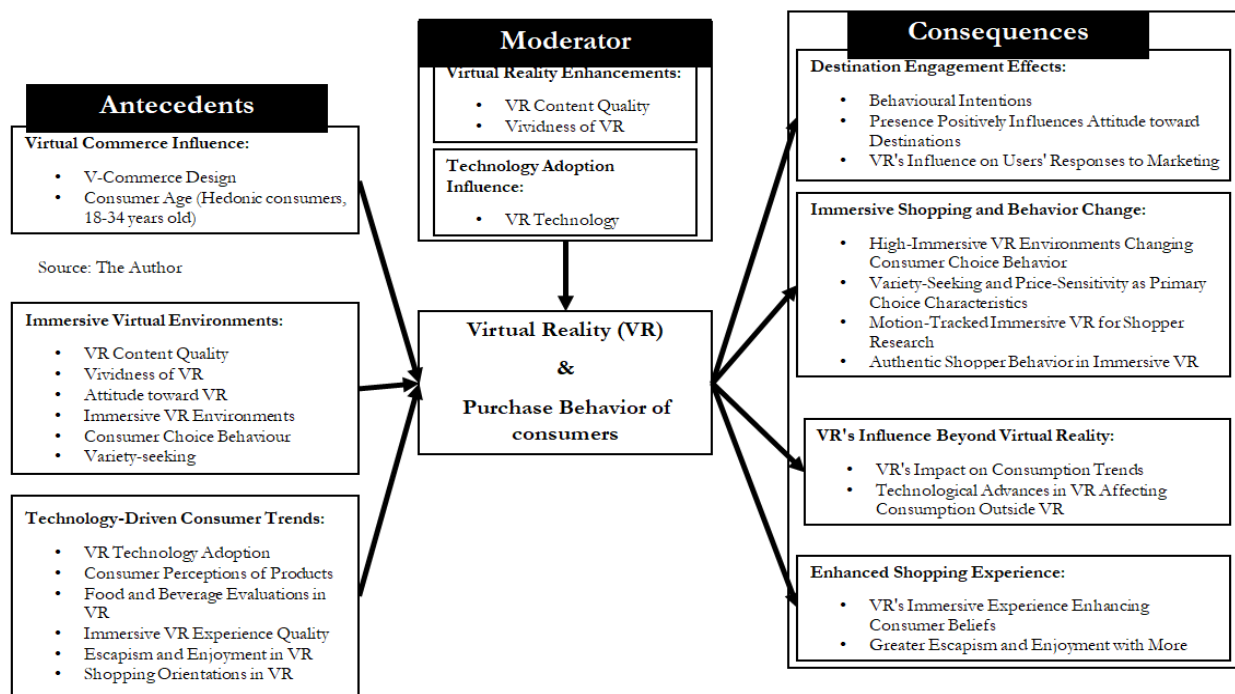


Figure 4 (Conceptual model)

Source: The Author

Table 6 (Thematic evolution & factors)

Table 6 (Key Themes)

	Factors	Findings Highlights
Theme 1: Virtual Commerce (V-Commerce) Design	V-commerce design	V-commerce design should surpass that of physical stores.
	Consumer age (Hedonic consumers)	Hedonic consumers (18 to 34 years old) are most responsive to v-commerce.

and Consumer Behaviour	Concerns about cost	Consumers worry about v-commerce's cost.
		Specific design guidelines for v-commerce are offered.
		V-commerce has untapped potential.
Theme 2: Virtual Reality (VR) and Destination Marketing	Factors	Findings Highlights
	VR content quality	VR content quality influences visit intention to a destination.
	Vividness of VR	Vividness of VR is key to attitude toward VR.
	Attitude toward VR	VR effects on attitude and behavioural intentions are unexplored from the IS success model.
	Behavioural intentions	Presence positively influences attitude toward destinations.
		VR influences users' responses to marketing stimuli.
		VR affects intention to visit destinations.
Theme 3: High-Immersive VR Environments and Consumer Behaviour	Factors	Findings Highlights
	Immersive VR environments	High immersive VR environments can change consumer choice behaviour.
	Consumer choice behaviour	Variety seeking and price sensitivity are primary choice characteristics.
	Variety seeking	Automated virtual environments for high immersive VR are the focus.
	Price sensitivity	Motion tracked immersive VR offers possibilities for shopper research.
		Shopper behaviour in immersive VR is authentic.
		Multicategory shopping trip behaviour in immersive VR is unconfirmed.
Theme 4: VR Technology and Consumer Trends	Factors	Findings Highlights
	VR technology adoption	VR technology is adopted for business purposes.
	Consumer perceptions of products	VR affects shoppers' perceptions of products.
	Food and beverage evaluations in VR	Food and beverage (F&B) quality linked to healthiness and hedonism.
	Impact on consumption trends	Different cues affect F&Bs' evaluation in immersive virtual stores.
		VR influences consumption trends.
		Advances in VR technology affect consumption outside VR.
		Identities developed in VR influence real-world consumption.
		VR can impact spending outside VR.
Theme 5: Immersive VR Shopping Experiences	Factors	Findings Highlights
	Immersive VR experience quality	VR's immersive experience enhances consumer beliefs.
	Escapism and enjoyment in VR	More immersive VR leads to greater escapism and enjoyment.
	Shopping orientations in VR	VR can make shopping more efficient.
		Specific research explores shopping orientations in VR.

Source: The Author

Table 7 (Trend in words usage)

Year	VIRTUAL REALITY	ADULT	CONSUMPTION BEHAVIOUR	FEMALE	MALE	ADOLESCENT	HUMAN	TOURIST BEHAVIOUR	YOUNG ADULT
2014	0	2	0	2	2	2	1	0	2
2015	0	2	0	2	2	2	1	0	2
2016	2	4	0	4	4	4	2	0	4
2017	2	4	0	4	4	4	2	0	4
2018	3	4	0	4	4	4	2	1	4
2019	5	5	0	4	4	4	3	1	4
2020	8	6	1	5	5	4	4	1	4
2021	11	6	3	5	5	4	4	2	4
2022	15	6	5	5	5	4	4	4	4
2023	18	6	6	5	5	4	4	4	4

Source: The Author

This concludes the content of this paper, and there is no further information beyond this point.