User engagement with the VR-based metaverse in the brand experience: A consumer perspective[1]

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Abstract

Frame of the research: The Virtual Reality (VR)-based metaverse may play a role in the technology-mediated user experience, as VR can create immersive virtual environments suitable for impactful marketing activities. Thus, this new experiential context offers novel opportunities for user engagement, branding and consumer responses.

Purpose of the paper: Our study explores the perceptual factors influencing multidimensional VR engagement, i.e., the cognitive, emotional, and behavioral dimensions, and the related branding outcomes in a VR metaverse brand experience.

Methodology: Given the complex and contemporary nature of the focal phenomenon, we adopt an abductive qualitative methodology and conduct in-depth interviews with Generation Z users with experience in immersive VR technologies.

Findings: Brand attitude ex ante and perceived immersion shape multidimensional VR engagement and branding outcomes in VR-based metaverse brand experiences. A positive brand attitude with high immersion is related to full VR engagement, generating evaluative and relational branding outcomes. Conversely, a positive brand attitude with weak immersion is associated with partial VR engagement, driving cognitive and evaluative branding outcomes.

Research limits: This study is limited to the Nike Jordan "Jumpman Zone" experience in Fortnite's VR metaverse, emphasizing the need to extend analysis to other platforms and brands. Future research should extend our exclusive focus on Generation Z individuals with experience with immersive VR reality technologies by analyzing different samples with quantitative methodologies.

Practical implications: Our findings provide insights for management into the factors that influence user engagement in VR metaverse environments and into the branding strategies that enhance multidimensional engagement to achieve different branding outcomes.

Originality of the paper: We advance both the literature on user engagement and the nascent research on branding in the VR-based metaverse by exploring VR engagement and branding opportunities, specifically, within the Fortnite metaverse, and gaining insights from the Generation Z perspective.

Key words: *user engagement; virtual reality; metaverse; brand experience; brand attitude; immersion*

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[1] This paper is the result of the joint effort of three authors: Maria Vernuccio, Sara Boccalini and Michela Patrizi. In the manuscript, however, paragraph §1 and §3 may be attributed to Maria Vernuccio, paragraphs §2.1, §2.2, §2.3, §4, §4.1 and §4.2 may be attributed to Sara Boccalini and paragraphs §5, and §6, may be attributed to Michela Patrizi.

1. Introduction

In the current marketing era where artificial intelligence and virtualization are leading the way, the metaverse represents one of the latest advances in technology and is enabled by extended reality technologies, i.e., augmented reality (AR), mixed reality (MR), and virtual reality (VR). In particular, the VR-based metaverse may play a role in the technology-mediated user experience (Cioppi *et al.*, 2023), as VR can create immersive virtual environments suitable for conveying impactful marketing activities. The expected growth in VR device sales of 5.5 million units per year between 2023 and 2028 (Alsop, 2023) underscores the potential for this technology to reach a wide consumer audience. Indeed, VR-based metaverse platforms such as Roblox, Decentraland and Fortnite boast approximately 400 million active users worldwide (Ruby, 2023). Of these users, 42% are Generation Z consumers who enjoy interacting with brands (Retail Connection, 2023). For instance, Nike is a pioneer in this space with its Nikeland on Roblox, while Jordan's Jumpman Zone deeply engages consumers through personalized avatars and immersive storytelling in Fortnite (Fortnite, 2021; Sandonnini, 2023). In this regard, the emerging academic marketing research on the VR-based metaverse emphasizes that metaverses' intensified immersion, interactivity, and collaboration offer unique opportunities for brands to generate greater consumer engagement than current social media applications and social networking sites (Yoo *et al.*, 2023; Hennig-Thurau *et al.*, 2023), with a significant impact on individual responses (Yoo *et al.*, 2023), as well as increased branding opportunities (Vernuccio *et al.*, 2023). In particular, the marketing literature on consumer engagement illustrates two main aspects of the user experience that can enhance engagement, i.e., the interactivity and cocreation enabled by the media context (Brodie *et al.*, 2011). The engagement that manifests with media is a multidimensional and context-specific construct (Brodie *et al.*, 2011) called user engagement, the cognitive, temporal, affective, and behavioral investment of the user when interacting with a digital system (O'Brien, 2016). User engagement is a central issue for brands and media managers due to the substantial increase in media variety (Chan-Olmsted and Wolter, 2018), highlighting the need to better understand what factors influence and what individual responses arise while engaging in specific contexts (Oh and Sundar, 2016; O'Brien and McKay, 2018).

The literature on user engagement has delved into various drivers across different media contexts. O'Brien and McKay (2018) underscore the significance of user, content, and design attributes of a web context, especially in eliciting perceptual factors, which are considered critical for enhancing user engagement (Oh and Sundar, 2016). Other studies have focused on specific contexts, such as mobile applications (Kim and Baek, 2018), social media (Tsai and Men, 2013), and online role-playing games (Jin *et al.*, 2017). However, scholars interpret engagement only through a unidimensional cognitive or behavioral lens and neglect the crucial role of perceptual factors.

Considering the emerging marketing research on VR-based contexts, there is still a notable knowledge gap regarding the perceptual factors

that influence multidimensional VR engagement, i.e., users' cognitive, emotional, and behavioral engagement with the VR environment. Indeed, Hollebeek *et al.* (2020) only theoretically explore the antecedents of multidimensional VR engagement during the virtual customer journey. Although Violante *et al.* (2019) empirically analyze VR engagement, the focus is on a direct virtual shopping environment adopting a technological perspective. Zhang *et al.* (2022) highlight game tasks and reward mechanisms as key engagement factors in the VR-based metaverse by considering the construct unidimensional and neglecting essential perceptual factors. Zhu and Yi's (2023) research identifies the similarity between avatar and user as a precursor to engagement in the metaverse, primarily adopting the cognitive perspective, which is related exclusively to avatar design. Notably, previous research on the metaverse has not explored user engagement during brand experiences.

Accordingly, our study aims to fill this gap by investigating the main perceptual factors that influence the rise of multidimensional VR engagement related to a brand experience in the VR-based metaverse (RQ1).

Furthermore, several marketing studies emphasize the central role of user engagement in shaping consumer responses to advertising and branding activities. Its influence on branding outcomes has been explored in different media contexts, including mobile apps, which emphasize brand self-connection (Kim and Baek, 2018), and social media, which increase brand loyalty (Zheng *et al.*, 2014). However, there is a critical knowledge gap regarding the contribution of user engagement to branding outcomes in VR-based contexts. Indeed, Hollebeek *et al.* (2020) relate multidimensional VR engagement to consumer brand relationship quality but in a purely theoretical way and without considering the specific context of the VR-based metaverse. Therefore, second, this research seeks to identify the main branding outcomes related to the multidimensional VR engagement that emerges in a virtual brand experience in the VR-based metaverse (RQ2). Given the complex and contemporary nature of these phenomena, an abductive qualitative methodological approach is adopted (Blaikie, 2009). This investigation allows us to identify the perceptual factors that drive VR engagement, as well as the related branding outcomes achievable during a brand experience in the metaverse. This paper is structured as follows: in the next section, the theoretical background of VR engagement is summarized (§ 2); then, the methodology adopted in the empirical investigation is described (§ 3), followed by an analysis of the results (§ 4); finally, the paper concludes with a discussion of these results, the academic and managerial implications of this study, its limitations and some future lines of research (§ 5).

2. Theoretical Background

2.1 Virtual Reality Engagement

User engagement with media is defined as a "psychological state where the user appraises the quality of media and becomes cognitively

and emotionally absorbed in media content, followed by a behavioral experience with which the user physically interacts with the interface and socially distributes the content" (O'Brien, H., 2016, p. 183). The literature highlights the central role of user engagement with media, considering both the ability of the medium to influence consumer responses (e.g., Dahlén, 2005; Oh and Sundar, 2018) and the substantial increase in technology-enhanced media contexts (e.g., Chan-Olmsted and Wolter, 2018). Specifically, Oh *et al.* (2018) illustrated a four-attribute process to understand the development of multidimensional user engagement with interactive media, whereby the multisensory nature of the interface attracts users as they physically interact with media content. Therefore, cognitive and emotional engagement are activated, encouraging users' behavioral and social responses to this experience (digital outreach) (Oh and Sundar, 2016; 2018).

In the literature on the metaverse, a central role is attributed to the multisensory interfaces and authentic physical interactions within the VR-based environment (e.g., Yoo *et al.*, 2023). This research suggests that these attributes can significantly increase consumer immersion, self-expression, content sharing, and socialization through avatars. Consequently, it outlines the potential of the VR-based metaverse to generate cognitive, emotional, behavioral, and social user responses (Longo and Faraci, 2023; Yoo *et al.*, 2023). However, the literature on multidimensional VR engagement in immersive environments is still in its infancy and offers mixed results.

While not specifically considering metaverses, Hollebeek *et al.* (2020) have proposed a conceptual model of a "virtual customer journey" in which cognitive, emotional, behavioral, and social VR engagement accurately reflects a consumer's investment in interactions with the virtual environment; specifically,
- the cognitive dimension is related to interest, attention, or learning information through the VR-based context;
- the emotional dimension is about VR-derived experiential gratification, escapism, entertainment, and aspirational desires;
- the behavioral dimension concerns the time, energy, and effort spent interacting with the VR-based context; and
- the social dimension reflects the VR-based social gratification experienced when interacting with others.

In contrast, the empirical study by Violante *et al.* (2019) interprets VR engagement in three dimensions-cognitive (i.e., attention and absorption), emotional (i.e., excitement and enjoyment), and behavioral (i.e., sharing, learning, approval)-considering only the construct concerning a virtual shopping environment (VR supermarket). In the nascent metaverse literature, a case study on the Nova Empire, a massive multiplayer online strategy game (MMOSG) considered a metaverse (Zhang *et al.*, 2022), focuses on user engagement. However, it predominantly interprets engagement through behavioral metrics (e.g., online time, level of play), emphasizing social patterns and reward mechanisms. Additionally, Lee *et al.* (2023) explore user engagement, highlighting its role in creating an enjoyable experience concentrating solely on the social perspective.

Concurrently, Zhu and Yi's (2023) research delves into user engagement through avatar design, exclusively focusing on the cognitive aspects related to immersive experience tasks. Hence, although nascent research has begun to investigate user engagement in VR-based metaverse environments, there has been a lack of consideration of the construct for its multidimensional meaning.

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2.2 Drivers of VR Engagement

The literature on multidimensional user engagement provides different perspectives on the antecedents of engagement in different media contexts, such as websites (e.g., Oh and Sundar, 2016; O'Brien and McKay, 2018). In particular, O'Brien and McKay (2018) offer a comprehensive perspective on the antecedents of multidimensional user engagement, considering individual user characteristics, content storytelling, and design features (e.g., interface aesthetics) to stimulate specific perceptual factors meriting attention (Sutcliffe, 2009). Perceptual factors encompass elements and processes tied to human perception, elucidating how individuals interpret and comprehend information from their surroundings (Qiong, 2017). These factors influence an individual's sensory experience with the environment and contribute significantly to the consumer's cognitive, emotional, and behavioral responses. For example, the sense of presence, which includes concentration, psychological involvement, and immersion (Witmer and Singer, 1998), plays a conditioning role in increasing content persuasion (Oh and Sundar, 2016) alongside the user's cognitive and emotional engagement (O'Brien and McKay, 2018) in the media context.

While the above literature provides valuable insights into the relevance of individual perceptions as precursors to multidimensional user engagement, it has focused on particular media contexts, such as mobile apps (e.g., Kim and Baek, 2018), social media (e.g., Tsai and Men, 2013), and online role-playing games (e.g., Jin *et al.*, 2017), revealing a notable gap concerning the multidimensionality of engagement along with perceptual factors. Kim and Baek (2018), for instance, predominantly interpret the construct from a unidimensional cognitive standpoint, emphasizing time convenience, interactivity, and compatibility as the primary determinants of user engagement with mobile applications. Conversely, other scholars have examined user engagement solely through a behavioral lens (e.g., Tsai and Men, 2013; Jin *et al.*, 2017), focusing on factors preceding user engagement, such as the parasocial interaction or community identification related to brand pages on social networks (Tsai and Men, 2013), or the social ties and social identity linked to online role-playing games (Jin *et al.*, 2017). Considering VR-based environments, which are designed to immerse individuals in a continuous flow of sensory information to enhance perceptual factors (e.g., sense of presence) (Barfield *et al.*, 1995), the study of perceptual antecedents to multidimensional user engagement is lacking. Hollebeek *et al.* (2020) conceptualize the antecedents of multidimensional engagement in VR in a purely theoretical way and interpret the motivations that drive users to interact with the virtual context, such as understanding, experiential, behavioral, and social

intentions. Only Violante *et al.* (2019) have empirically investigated the antecedents of multidimensional engagement in VR. However, they focus on an unbranded purchase environment, which may be designed to optimize functional efficiency, not convey experiential value (e.g., Schmitt and Zarantonello, 2013). Moreover, they adopt a predominantly technological perspective, considering "hypertextuality", the "modality" of content presentation, "connectivity" with other sites, the "mobility" allowed in the virtual environment, the "location specificity" of a store and the "virtuality" of 3D objects.

The research on the antecedents of user engagement in the metaverse context currently comprises only a few studies, including Zhang and colleagues' research (2022), which has identified the nature of a game task and reward mechanism as the major influencing factors (Zhang *et al.*, 2022); however, it interprets engagement as a unidimensional construct and neglects perceptual factors. Concurrently, Zhu and Yi (2023) find that avatar-user perceived similarity plays a role in increasing user engagement with tasks on metaverse platforms. However, although this represents an initial contribution regarding user perceptions, the study of antecedents is limited to avatar design aspects. Moreover, user engagement is considered only from a one-dimensional perspective. Therefore, the first RQ of this paper is as follows:

RQ 1 - What are the main perceptual factors that influence the rise of multidimensional VR engagement related to a brand experience in a VR-based metaverse?

2.3 Branding Outcomes Related to VR Engagement

Several marketing studies have identified the key role of user engagement in the media context in influencing consumers' responses to a proposed experience (Oh and Sundar, 2016; Lubis *et al.*, 2019) in terms of both responsiveness to advertising (e.g., Dahlén, 2005; Malthouse *et al.*, 2007) and branding outcomes (e.g., Chan-Olmsted and Wolter, 2018). Indeed, according to Dalhén (2005), the media context strongly influences consumers' brand-related responses as follows: first, by easing the processing of certain feelings and making them more accessible; second, by influencing the perception of the experience in consumers' minds, in which the media context converges with the brand; and, finally, by acting as the first cognitive element, by activating a "semantic network" that can guide users' attention during and interpretation of the experience. Kim and Baek (2018) indicate that consumer engagement with mobile apps fosters brand self-connection, as it becomes a vehicle for personal expression and connection with the brand one accesses. Similarly, Zheng *et al.* (2014) show that user engagement in Facebook brand communities leads to brand loyalty, as community participation is seen as public engagement, encouraging users to align with community practices and promote a brand. Although the role of user engagement in emphasizing consumer responses has been analyzed in different media contexts, e.g., mobile apps, websites, or social media, concerning VR environments, the only salient study exploring the potential link between VR engagement

and branding outcomes is the theoretical contribution of Hollebeek *et al.* (2020). According to the framework proposed by these authors, the multidimensional VR engagement developed during the "virtual customer journey" experience affects the components of "brand relationship quality" in different ways depending on the relevant engagement dimension (i.e., cognitive, emotional, behavioral, and social). Specifically, cognitive VR engagement plays a significant role in evaluating brand partner quality and cognitive commitment, as VR's immersive environment is designed to encourage profound reflection on brand distinctiveness and performance. Emotional VR engagement influences affective commitment, fostering a stronger emotional bond through positive VR experiences. Behavioral VR engagement significantly affects commitment and passion for and love of a brand, as an increased dedication of time and energy deepens this connection. VR social engagement enhances brand affection, involving consumers in enriched social connections during the immersive experience.

However, to our knowledge, no empirical study has analyzed the role of multidimensional VR engagement in increasing brand responses during an immersive brand experience, even less so in VR-based metaverse systems, underscoring a critical gap in the literature. Therefore, we propose the second RQ:

RQ 2 - What are the main branding outcomes related to the multidimensional VR engagement that emerges in a virtual brand experience in the VR-based metaverse?

Accordingly, the present study is situated in the marketing literature at the intersection of the research on user engagement and branding in the VR-based metaverse; it thus analyses both the perceptual factors influencing VR engagement in this innovative context and the key branding outcomes related to VR engagement.

3. Methodology

3.1 Abductive Research Approach

Given the purpose of the study, we adopted an abductive qualitative methodology (Blaikie, 2009). This methodology is particularly suitable for producing an in-depth understanding of complex and contemporary phenomena, such as multidimensional VR engagement, as well as the related perceptual factors and brand responses in metaverse contexts. Through a continuous and simultaneous interaction of theory, empirical detection, and analysis (Van Maanen *et al.*, 2007), the abductive approach allows a novel comprehension of extant phenomena, inspecting them from a new viewpoint. The adoption of abductive research logic implies moving from "prior theoretical knowledge" to "empirical evidence" to "theory matching" to "theory suggestion" to "application to a case" (Kovács *et al.*, 2005).

3.2 Sample and Setting

The data were collected through in-depth interviews with users with experience with immersive VR technologies (i.e., visor usage at least once a week for at least one year) and members of Generation Z (ages 18-27) (Francis and Hoefel, 2018), as this segment has shown higher rates of VR technology adoption than older generations (Jayaraman, 2022). Initially, respondents were selected by applying the "key informant technique", which was followed by the "snowball sampling strategy". To determine the final sample size, the data saturation criterion was applied (Guest *et al.*, 2006; Saunders and Townsend, 2016). Specifically, data saturation denotes the situation in which no new themes emerge from the interviews or ongoing analysis. In this study, the criterion was satisfied by interviewing 22 Italian young people. The final sample is equally divided between men and women aged 19 to 27 years and heterogeneous in terms of education (i.e., secondary school diploma, high school graduation, bachelor's degree, master's degree) and occupation (e.g., driver, psychologist, freelancer, student) (Table 1).

Tab. 1: Overview of interview participants

ID	Gender	Age	Education	Occupation
1	M	25	High School Graduation	Driver
2	M	26	Bachelor's Degree	Student
3	F	24	High School Graduation	Courier
4	F	24	Bachelor's Degree	Marketing Intern
5	M	27	Master's Degree	Entrepreneur
6	M	25	High School Graduation	Student
7	M	27	Master's Degree	Psychologist
8	M	23	High School Graduation	Unemployed
9	M	26	Bachelor's Degree	Office Clerk
10	M	19	Secondary School Diploma	Student
11	M	26	High School Graduation	Unemployed
12	M	26	Master's Degree	Office Clerk
13	M	26	High School Graduation	E-games Coach
14	F	26	Secondary School Diploma	Freelancer
15	M	27	High School Graduation	Freelancer
16	M	23	High School Graduation	Barman
17	F	26	Bachelor's Degree	Social Media Manager
18	F	25	Bachelor's Degree	Unemployed
19	F	24	Master's Degree	Marketing Executive
20	F	24	Bachelor's Degree	Student
21	F	26	Master's Degree	UX Researcher
22	F	24	Bachelor's Degree	Office Clerk

Source: Authors' elaboration

The virtual environment chosen for this study is that proposed by Nike Jordan (a brand that mainly targets younger generation members), called the "Jumpman Zone", which is usable in the Fortnite VR metaverse. As of 2021, the "Jumpman Zone" allowed users to collect different Nike Jordan brand accessories (i.e., "skins") for customizing their avatars. To this end,

a user must complete multiple challenges related to playing basketball in four different portals of increasing difficulty. Each interviewee experienced Nike Jordan for the first time during their interview, using the Oculus Quest 2 with the respective joysticks connected to a PC. This experience through the visor allowed the interviewees to have a "screen" mode view and play with their avatar without a "first-person" perspective, however.

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3.3 Procedure

Following the abductive approach, a semistructured interview guide was developed based on the above literature with the aim of collecting spontaneous responses through open-ended questions. First, interviewees' technological habits related to VR and their knowledge (e.g., "Can you describe your approach to and dealings with VR technology in your daily life?"), attitudes, and behaviors concerning Nike Jordan were investigated (e.g., "Thinking about Nike Jordan, what are your opinions about this brand?"). Afterward, the respondents wore the visor to live the selected brand experience, which lasted an average of 15 minutes. Specifically, users were asked to complete all the game levels in the first of four portals in the "Jumpman Zone". At each level, respondents played individually in 3-D environments characterized by elements referring to both the sport of basketball and the brand (e.g., the brand logo reproduced on the floor). Once the virtual experience concluded, new questions were formulated to explore users' perceptions of the different dimensions of VR engagement during the brand experience (e.g., "Do you feel that the experience you have just lived has stimulated significant emotions? Which ones?"), as well as their perceptions of the Nike Jordan brand (e.g., "After having this experience, has your opinion of the Nike Jordan brand changed?").

All in-person interviews, lasting an average of 50 minutes, were conducted between December 2022 and March 2023. Specifically, one participant per time was invited by a member of the research team to a dedicated room in the Department of Management, which was used to carry out the interview and join in the brand experience.

All interviews were audio-recorded with prior consent and transcribed, resulting in 271 pages of 1.5 line-spaced content in 12-pt font. To analyze this "corpus", we employed an abductive logic (Blaikie, 2009) in iterative and multiphase coding based on qualitative thematic analysis, which adopts the theme as a criterion for identifying the units of analysis (King and Horrocks, 2010). After careful and repeated reading of each interview, the first step was a line-by-line open coding analysis of the text (Maguire and Brid Delahunt, 2017), which led to the identification of the "descriptive codes", i.e., discrete themes characterized by a high degree of detail (e.g., concentration, loss of time and reality cognition, sensory realism, realism in motion, pleasure, excitement, fun). The second step involved early logical abstraction from the detailed codification, which led to the definition of more general themes, i.e., "integrative themes" (e.g., absorption, realism, enjoyment). Finally, through further logical abstraction, matching different "integrative themes" and "overarching themes" were defined (e.g., immersion) (Appendix, Table 2). By applying abductive reasoning, it was

possible to connect the conceptual categories that gradually emerged from open coding to the literature ("theory matching phase", Van Maanem *et al.*, 2007). In addition, when there was no correspondence with the literature, unexpected insights made it possible to derive a new viewpoint (Welch *et al.*, 2013). In line with King and Horrocks's (2010) suggestions, two members of the research team were involved separately in the open coding process (i.e., the *code-defining* approach) and compared, discussed, and aligned with the results at the end of the work phases. Indeed, the code-defining approach is advisable within a team, as the research members can obtain more contextual knowledge about the data, which is useful for generating a deeper and more holistic discussion on the setting and articulation of the codes (King and Horrocks, 2010). The overall intercoder agreement index for all codes as a set was calculated by dividing "the total number of agreements for all codes by the total number of agreements and disagreements for all codes combined" (Campbell *et al.*, 2013, p. 309). The ratio was 86%, thus overcoming the 80% threshold (Miles *et al.*, 2019).

Moreover, to guarantee an acceptable level of trustworthiness and ensure the reproducibility of the coding (Campbell *et al.*, 2013), we involved two expert coders from outside the research team; they were all trained experts in the subject matter (Miles *et al.*, 2019). The coders received the transcripts and related codes (i.e., the coding scheme) and were commissioned to confirm (or unconfirm) the association (i.e., *code-confirming* approach) (King and Horrocks, 2010). The intercoder agreement was 89%, which again exceeded the 80% cutoff (Miles *et al.*, 2019). Consequently, this high level of agreement indicated that the resulting coding system is reliable and solid.

This analytical procedure allowed us to conceptualize the i) integrative themes (e.g., cognitive VR engagement) and overarching themes (i.e., VR engagement) that characterize respondents' views and ii) a conceptual model for interpreting the main perceptual factors influencing multidimensional VR engagement, as well as branding results, in the metaverse (§ 4).

4. Findings

The thematic content analysis allowed the identification of several key themes in terms of both the *perceptual factors influencing multidimensional VR engagement* in the metaverse and the *branding outcomes* related to VR engagement through a virtual brand experience.

4.1 *Main Perceptual Factors Influencing Multidimensional VR Engagement (RQ1)*

Unexpectedly, brand attitude ex ante (overarching theme) emerged from the interviews as the main perceptual factor influencing consumer experience. Conceived by the respondents as their disposition and opinion toward the brand, like/dislike of branded products, and evaluation of brand communication, brand attitude ex ante appeared in three main forms: positive, indifferent, or negative. Considering that the majority of

interviewees showed a positive attitude toward Nike Jordan, this section focuses on this specific case. In particular, when the brand attitude ex ante was positive, the experience was perceived as significant and attractive by respondents. In this regard, the interviews suggest that the greater attractiveness of an experience is due to the possibility of enjoying a brand that one appreciates in a context where the presence of that brand has an impact, in contrast to an unbranded gaming experience.

"*People who are fans of the Jordan brand, those who already wear Jordans, like me, are much more attracted to the experience because they can have the chance to get closer to the brand they like and not just experience it as a game. (...) If I didn't have a previous opinion toward the brand, I wouldn't have experienced it as bringing me closer to the brand, but I would have been indifferent because I would have perceived it only as a gaming experience in Fortnite*". (Interviewee 7)

Moreover, when the brand attitude ex ante was positive, another crucial perceptual factor emerged from all the interviews: *immersion* (overarching theme). Based on the analysis of the interviewees' answers, immersion is conceptualized through three main subthemes: absorption, realism, and enjoyment (integrative themes). Absorption is conceived as a feeling of deep concentration amid the loss of cognition of time and reality, as revealed by Interviewee 2:

"*I feel completely surrounded. I'm out of your world for that half an hour, I mean it's like all my problems pass me by, I don't have them anymore, I lose track of time. It's not because I don't think, but because I'm inclined to stay focused by the thousands of things to do, my brain is busy*". (Interviewee 2)

The second attribute of immersion manifested as perceived realism, both in terms of the sensory stimuli able to replicate real stimuli (e.g., visual stimuli, due to the first-person view and the quality of 3D graphics) and in terms of the realism in movement enabled by the virtual environment:

"*I strongly believe that as soon as we replicate as faithfully as possible sound, sight, which are two of the main senses with which we interact with the world, with which we remember information, the immersion is very high*". (Interviewee 5)

Enjoyment is the third attribute of immersion revealed by respondents. It relates to a feeling of pleasure and the excitement and fun during the VR experience (descriptive codes), as highlighted by Interviewee 1:

"*When I am immersed in a situation that I am passionate about, I feel very close to the experience, it is really enjoyable. For example, I am passionate about cars, and when I am driving immersed in VR, I get a really pleasant feeling. The pleasure is really in being in the car and driving as if I were actually doing it*". (Interviewee 1)

The interviewees described their perceptions of immersion in two main modalities: deep or weak. Respondents who experienced a deep perception of immersion described it as due to their high concentration in the experience, perceived realism in their movements, and feeling of fun during their experience:

"*The feeling of immersion is still high, as you are always inside the viewer, which still closes your view to the outside, so you are still immersed. I concentrated easily. Then, with the joystick on the visor, it is also more interactive and fun than on the PlayStation because it reproduces the naturalness of movements better*". (Interviewee 7)

In contrast, the interviews indicated that those who experienced weak immersion described their perceptions mainly in terms of their low sensory realism, as well as their low perception of absorption and excitement during their experience:

"*Fortnite's third-person view does not help identification because you are always behind the character. (…). It is a matter of sensory distance. It was like being in front of a movie screen. You're not truly focused on what you're doing. Also, the experience becomes really unpleasant because the main problem is the fact that when you move your head, there is no movement in the image, and the immersion dies immediately. Because you say, 'Okay, I'm not in it, I'm observing it'*". (Interviewee 10)

Content analysis thus revealed that immersion is a perceptual factor that plays an important role in VR engagement. Indeed, the interviews show that those who experienced a deep perception of immersion experienced full VR engagement, i.e., in cognitive, emotional, and behavioral terms. Conversely, respondents who experienced a low perception of immersion indicated only partial VR engagement, i.e., in cognitive and behavioral terms. Therefore, the intensity of perceived immersion (deep or weak) affects the development of the emotional dimension of VR engagement.

As shown by Interviewee 7, the cognitive dimension emerges mainly in terms of interest in and attention to the virtual environment, especially due to the innovativeness of the focal experience:

"*I had never seen a famous brand in a virtual reality experience before; it was something new for me, and this stimulated my interest and attention in this innovative environment*". (Interviewee 7)

On the other hand, the emotional dimension emerged mainly in terms of interviewees' happiness concerning their stronger bond with a brand they like and their fun in terms of entertainment and gratification due to the immersive nature of the focal experience, as Interviewee 9 expresses:

"*This experience made me happy, especially because it brought back all the memories with shoes, and I have the very shoe from the game in my wardrobe. The game is really cute; it entertained and stimulated me*". (Interviewee 9)

Concerning the behavioral dimension of VR engagement, respondents expressed themselves positively in terms of the effort needed to perform the completed task and their willingness to continue afterward to take the time to retry the focal experience, as they felt particularly engaged by the motivating dynamics of the branded immersive game:

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"*It was a beautiful and challenging task in all the right ways. It's an experience I would have continued*". (Interviewee 11)

Therefore, in light of the results obtained, the following propositions are formulated:

P1: When the brand attitude ex ante is positive, immersion emerges as the crucial perceptual factor in a brand experience in the VR-based metaverse. Specifically, immersion is conceptualized through three main dimensions: absorption, realism, and enjoyment.

P2: When a user experiences a deep perception of immersion in the VR-based metaverse (i.e., high levels of absorption, realism, and enjoyment), he or she lives full VR engagement, i.e., in cognitive, emotional, and behavioral terms.

P3: When a user experiences a weak perception of immersion in the VR-based metaverse (i.e., low levels of absorption, realism, and enjoyment), he or she lives partial VR engagement, i.e., in cognitive and behavioral terms.

4.2 Branding Outcomes Related to Multidimensional VR Engagement (RQ2)

Among the respondents who revealed a positive brand attitude ex ante and a deep perception of immersion concerning their resulting full VR engagement, two main branding outcomes emerged: brand image improvement and consumer identification with the brand. Specifically, the interviewees pointed to an improvement in Nike Jordan's brand image, i.e., the brand characteristics perceived by consumers. In fact, the interviews revealed that after their experience, the brand had been reconsidered in terms of its youthfulness, modernity, and resourcefulness:

"*I thought it had aged a bit, but after experiencing this, I was able to retract my thinking. It remained a youthful and up-to-date brand. My idea of the brand has changed; I thought it was an aging brand, but I have to think again*". (Interviewee 13)

Furthermore, respondents perceived an increase in consumer identification with the brand, interpreted from a dual perspective: the personal perspective, i.e., the support that the experience with Nike Jordan can provide respondents in emphasizing their personalities and expressing their values; and the social perspective, i.e., the support that the experience with the brand can provide in the development and communication of their identity and social status to others.

Indeed, as Interviewee 9 testified, the virtual experience with the brand supported increased his or her self-confidence due to his or her identification with Nike Jordan's "swag" characteristics, representing its innovative and original presence among its consumers (personal consumer brand identification):

"*I've always liked Nike Jordan, (…). They helped me a lot when I was a kid, and I was struggling to open up. When I started getting my first pair of Jordans, I felt more confident. This experience made me want to wear them again because I miss the swag feeling that Jordans give me. For me, it's dragging*". (Interviewee 9)

On the other hand, consumer identification with the brand emerged from a social perspective, as revealed by Interviewee 7, by relating how the Nike Jordan brand supports consumers in communicating their identity, social status, and the values they share with other users (consumer social identification with the brand):

"*The brand is related to me, and we share the same values. Therefore, wearing Jordans in VR allows me to express who I am with the other virtual user community*". (Interviewee 7)

Conversely, regarding the respondents who showed a positive brand attitude ex ante but a weak perception of immersion and associated partial VR engagement (cognitive and behavioral), branding outcomes emerged, primarily brand recall and brand image. Brand recall, the return to the memory of the brand following a relevant clue, emerged in several interviews following the experience. In fact, as a result of the Nike Jordan brand experience, this brand, present in the interviewees' lives in the past but no longer returned to these consumers' memories, as Interviewee 10 states:

"*I didn't remember the existence of this brand. From experience, maybe I could start to get more aware of Jordan and take slightly more of look at it again*". (Interviewee 10)

Regarding brand image, interviewees perceived an improvement in the characteristics associated with the brand, especially its resourcefulness in realizing a different and innovative experience:

"*I saw the resourcefulness of the brand in creating a new experience. I didn't think that such an experience could be related to the Nike Jordan brand, so it was a surprise. Just the talk of noticing this willingness to do something different, however, is a positive sign*". (Interviewee 1)

Nevertheless, for the purpose of comprehensiveness, only a few respondents showed indifferent or negative brand attitudes ex ante. Among them, extremely minimal or no immersion was due to the absence of perceived absorption, nonexistent realism, and low enjoyment, especially

related to their enjoyment according to immersive game dynamics. In this case, only low behavioral engagement emerged in terms of the effort spent in the game. However, no branding outcomes were observable in connection with behavioral VR engagement:

"*Although the game did not pique my interest in the brand, I liked it [the game] once I got the hang of it. I enjoyed it, and it was quite challenging*". (Interviewee 18)

Considering these findings, the following propositions are posited:

P4: When a user experiences a deep perception of immersion in the VR-based metaverse and full VR engagement, brand image improvement (evaluative) and consumer identification with the brand (relational) emerge as the two main branding outcomes.

P5: When a user experiences a weak perception of immersion in the VR-based metaverse or partial VR engagement, brand recall (cognitive) and brand image (evaluative) emerge as the two main branding outcomes.

According to the role of brand attitude ex ante and perceived immersion in influencing VR engagement and related branding outcomes, the content analysis enabled a conceptual representation of the abovementioned results (Figure 1).

Fig. 1: Conceptual model of virtual reality engagement and branding results in a metaverse brand experience

Source: Authors' elaboration
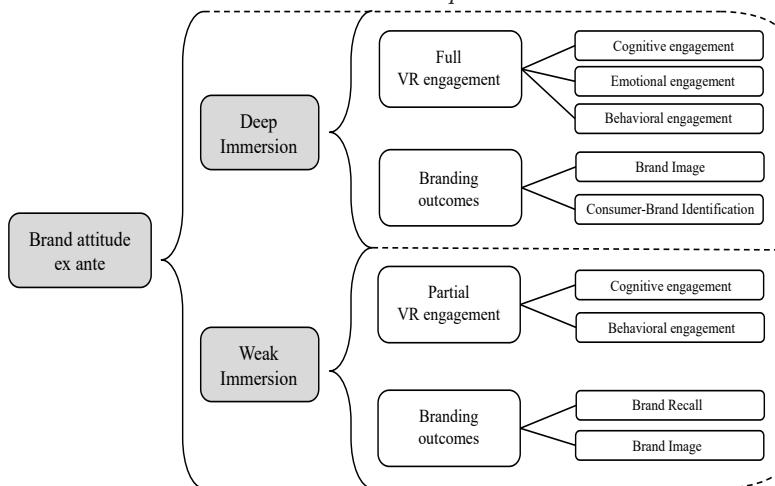
5. Discussion

5.1 Theoretical Implications

The present study is positioned at the intersection of related research on user engagement and the nascent literature on metaverse and branding.

This study advances the knowledge in both domains by identifying, first, the perceptual factors influencing the rise of multidimensional VR engagement during a brand experience in the metaverse (RQ1) and, second, the branding outcomes related to the construct (RQ2).

Our investigation addresses a critical gap in the literature on user engagement in immersive brand environments by proposing the first empirical exploration of cognitive, emotional, and behavioral engagement during a brand experience in VR-based environments, while previous studies view user engagement as a one-dimensional construct in an unbranded experience (e.g., Violante *et al.*, 2019; Zhang *et al.*, 2022; Zhu and Yi, 2023).

The results of our first research question (RQ1) highlight brand attitude ex ante and perceived immersion as perceptual factors that can influence multidimensional VR engagement during a metaverse brand experience. This study contributes to the marketing literature on brand attitude ex ante, which has explored the focal influence on consumer responses in contexts such as brand advertising (Lee, 2010) and crisis communication on Twitter (Jahng and Hong, 2017). Our study advances these insights in immersive environments, particularly in VR-based metaverse environments. Moreover, our results suggest that a positive prior brand attitude can influence perceived immersion, user engagement and brand response, enriching the literature on its significant role not only in marketing response but also in individual perception in immersive contexts. Second, our study advances the understanding of immersion in several ways. The results offer a conceptualization of perceived immersion through three dimensions: absorption (i.e., concentration and loss of cognition of reality), realism (i.e., sensory and motor), and enjoyment (i.e., pleasure, excitement, and fun).

This holistic approach overcomes the often-adopted dichotomy, which views immersion either as composed of cognitive absorption and fluency (e.g., Mütterlein *et al.*, 2018) or as pure sensory fidelity of the virtual environment (e.g., Morélot *et al.*, 2021). Moreover, for the first time, this study suggests that the intensity of immersion influences the perception of multidimensional VR engagement and different branding outcomes (e.g., consumer-brand identification), thus contributing significantly to the marketing literature, which has recognized only "satisfaction with the VR experience" (Mütterlein *et al.*, 2018), "recall of information" (Shen *et al.*, 2021), and "continuance of usage VR devices" (Dehghani *et al.*, 2022) as outcomes of perceived immersion in VR-based brand environments. Third, our results contribute to the user engagement literature. In general terms, the study allows for a broadening of existing engagement models, which have predominantly been limited to physical and digital interactions, thus incorporating a nuanced third dimension-virtual reality. Specifically, this study expands the body of knowledge on the antecedents of user engagement in various technological contexts, such as mobile apps (Kim and Baek, 2018) and social media (Zheng *et al.*, 2014), where brand attitude ex ante and perceptions of immersion have not been considered precursors of engagement. In this regard, we also suggest a departure from the literature, where the sense of presence has been identified as a

significant perceptual factor in user engagement in the metaverse (Oh and Sundar, 2016), a factor that did not emerge in our exploration. Moreover, despite extant research primarily conceptualizing engagement from a unidimensional perspective, our study introduces a multidimensional approach. Considering the VR-based environment context, our study advances the literature by empirically exploring the perceptual antecedents of user engagement in an experiential branded environment, differentiating from Hollebeek *et al.*'s (2020) theoretical focus on usage motivations to engage users, along with Violante and colleagues' (2019) investigation of the technical factors that stimulate multidimensional engagement in an unbranded shopping environment. In the metaverse research strand, our approach diverges from Zhang and colleagues' gaming-oriented study on factors enhancing unidimensional engagement, as we conceptualize the metaverse as a platform for social, economic, and cultural experiences (Yoo *et al.*, 2023), emphasizing a multidimensional perspective on engagement. Moreover, in contrast to Zhu and Yi's (2023) emphasis on avatar design for maximizing cognitive engagement, our study advances the literature by exploring how perceptual factors in a brand context shape multidimensional VR engagement.

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Considering the results of the second explorative research question (RQ2), which identifies the branding outcomes associated with different emerging dimensions of VR engagement, our contribution to the literature develops in two significant directions. First, within the research strand on user engagement, studies on brand outcomes related to engagement reveal a critical gap, having traditionally considered the construct in a unidimensional way, focusing on specific outcomes such as responsiveness toward adv (e.g., Dahlén, 2005), brand self-connection (Kim and Baek, 2018), and brand loyalty (Zheng *et al.*, 2014).

In contrast, our study stands out, contributing to the literature by providing an exploratory approach aimed at identifying branding outcomes related to different dimensions of VR engagement. This enriches the literature, as it identifies evaluative and relational branding outcomes (such as brand image and brand self-connection) associated with full VR engagement and evaluative and cognitive branding outcomes (such as brand image and brand recall) related to partial VR engagement. Second, in the immersive context, the only study linking multidimensional VR engagement to relational branding outcomes (consumer-brand relationship quality) is the theoretical study of Hollebeek *et al.* (2020). Consequently, our study represents an empirical extension of the branding literature to the metaverse environment, which, thus far, has not been thoroughly explored.

5.2 Practical Implications

Our study offers crucial insights for management into the factors that influence user engagement in the VR metaverse and into the branding strategies that enhance multidimensional engagement to achieve different branding outcomes. The central role of brand attitude ex ante in shaping consumer responses to virtual brand experiences entails strategic implications for managers. To target individuals with a positive preexisting

brand attitude, we recommend immersive content strategies that engage users across cognitive, emotional, and behavioral dimensions by promoting intriguing information, creating emotional content, and providing experiential dynamics requiring active commitment. Conversely, for those with indifferent or negative brand attitudes, we suggest developing experiential dynamics mainly to trigger behavioral engagement, coupled with communication stimuli strategically designed to foster a more positive attitude (e.g., an underlying narrative emphasizing brand values). Simultaneously, as perceived immersion emerges as a key factor in shaping multidimensional VR engagement, especially in the emotional dimension, along with relational branding outcomes, not observed in low-immersion scenarios, additional insights for management become apparent. Indeed, managers should adopt strategies aimed at elevating user immersion. Therefore, we suggest addressing the three emergent dimensions of immersion: perceived realism through graphic and sensory enhancements; enjoyment through appealing and entertaining content; and absorption through interactive and captivating materials. Moreover, by examining how different combinations of prior brand attitude and perceived immersion lead to specific branding outcomes, managers can optimize strategies within the metaverse. This optimization includes refining key messages and creating tailored content to resonate most effectively with distinct audience segments. In scenarios where users demonstrate a positive brand attitude coupled with high immersion, leading to brand self-connection and a favorable brand image, managers should focus on reinforcing this connection through strategic emotional messaging and content. Conversely, when consumers exhibit positive brand attitudes but lower immersion, a tailored message may underscore brand recall, incorporating intriguing brand information or involving users in brand-related activities, complemented by content reinforcing the brand image.

5.3 Future Lines of Research

Our study opens new lines of research in terms of unexplored variables, unresolved questions and alternative research methods. Notably, the sense of presence does not emerge in the study results, despite its acknowledged importance in the literature as an antecedent of engagement in interactive media contexts (e.g., websites; Oh and Sundar, 2016; O'Brien and McKay, 2018), along with its distinctive role in the VR-based context (e.g., Barfield *et al.*, 1995). Therefore, research should investigate the perception of presence in a metaverse brand environment by examining its relationship with VR engagement and branding outcomes. An additional point of interest concerns the perception of immersion, which emerges at different levels of intensity (deep vs. weak) even among users with a positive brand attitude ex ante, prompting exploration into unresolved questions regarding individual variables influencing perceived immersion, e.g., technology acceptance or immersive tendencies. Additionally, our results suggest the need for different methodologies to explore identified constructs. For example, a quantitative approach could be used to examine the moderating role of immersion in the relationship between prior brand attitude and

multidimensional VR engagement. Moreover, experimental studies could measure emotional responses under different immersion levels in the VR-based metaverse, particularly as weak perceived immersion is associated with less emotional engagement and relational branding outcomes. Furthermore, considering the different emerging branding outcomes associated with full and partial engagement in VR, we invite researchers to further investigate the relevant VR-based metaverse results (e.g., brand loyalty, equity, personality). Considering the growing popularity of the metaverse, scholars are encouraged to propose best practices for measuring branding objectives through VR-based brand experiences.

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6. Conclusion and limitations

In this study, we have begun to address relevant gaps in the literature at the intersection of user engagement and the emerging strand of metaverse and branding, aiming to identify perceptual factors influencing multidimensional VR engagement (RQ1) and associated branding outcomes (RQ2) during a brand experience in the VR-based metaverse. Our results reveal the pivotal roles of brand attitude ex ante and perceived immersion, showcasing various scenarios. Respondents with a positive brand attitude and deep immersion experienced full VR engagement (i.e., cognitive, emotional, behavioral) with the emergence of branding outcomes such as brand image (evaluative) and consumer brand identification (relational). In contrast, those with a positive brand attitude and weak immersion showed partial VR engagement (i.e., cognitive and behavioral), yielding outcomes such as brand recall (cognitive) and brand image (evaluative). Respondents with indifferent or negative brand attitudes experienced minimal or no immersion, resulting in weak behavioral VR engagement without branding outcomes. Our study advances the literature on prior brand attitude, emphasizing its influence on individual consumer responses to marketing stimuli. Additionally, we contribute to the literature on metaverse branding experiences by comprehensively conceptualizing immersion (i.e., absorption, realism, and enjoyment), highlighting its relevance in developing the emotional dimension of user engagement and relational branding outcomes. This research extends the empirical knowledge on multidimensional user engagement in branded immersive environments, specifically the VR-based metaverse, unlike the literature showing a critical gap, as it focused on unidimensional engagement or conceptual perspectives. Furthermore, our results associate specific dimensions of VR engagement, along with cognitive, evaluative, and relational branding outcomes, with different prior brand attitudes and perceived immersion during the brand experience in the VR-based metaverse, highlighting several branding opportunities in the innovative environment.

However, our paper is not exempt from limitations. The study's focal context, the Nike Jordan "Jumpman Zone" in Fortnite's VR metaverse, opens new extensions into other VR worlds (e.g., Roblox, Decentraland), brand experiences (e.g., Looptopia by H&M, Vans World, NikeLand,

Gucci Town), and product categories (e.g., automotive, food & beverage, luxury fashion). Moreover, the "Jumpman Zone" lacks a social dimension (i.e., the opportunity to socialize with other users during the experience) and complete immersive features (e.g., 360° view, first-person avatar perspective; Vernuccio *et al.*, 2023). Finally, the exclusive consideration of Generation Z consumers with VR experience and the qualitative nature of our research limit generalization, highlighting the need for different samples and quantitative methodologies in future investigations.

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Appendix - Table 2. Coding extract example

Interviewee	Interview extract	Descriptive codes	Integrative theme	Overarching theme
Interviewee 7	With the headset, you feel completely concentrated on the situation you're in. You're surrounded by the environment in 360°, filled with numerous virtual stimuli, so you don't get distracted; you're fully present, even in your mind.	Concentration	Absorption	Immersion
Interviewee 2	I felt concentrated because I didn't have visual distractions, and I was focused on what I was doing.	Concentration		
Interviewee 2	I have so much information and so many stimuli around me that I'm almost compelled to stay concentrated.	Concentration		
Interviewee 1	You lose all sense of time because, for example, you have headphones, the headset, with all the music and settings that isolate you.	Loss of time and reality cognition		
Interviewee 2	I feel completely surrounded. I'm out of your world for that half an hour, I mean it's like all my problems pass me by, I don't have them anymore, I lose track of time. It's not because I don't think, but because I'm inclined to stay focused by the thousands of things to do, my brain is busy.	Loss of time and reality cognition		
Interviewee 5	I strongly believe that as soon as we replicate as faithfully as possible sound, sight, which are two of the main senses with which we interact with the world, with which we remember information, the immersion is very high.	Sensory Realism	Realism	
Interviewee 5	If the setting and 3D reconstruction are realistic and done in 360 degrees, it can have a significant immersive impact.	Sensory Realism		
Interviewee 6	It's necessary that in an experience, there are no lags in movements; they should be smooth and as natural as possible. Otherwise, it's easy to disconnect from the experience.	Realism in motion		
Interviewee 7	Then, with the joystick on the headset, it is also more interactive than on PlayStation because it reproduces the naturalness of movements better.	Realism in motion		
Interviewee 1	When I am immersed in a situation that I am passionate about, I feel very close to the experience, it is really enjoyable. For example, I am passionate about cars, and when I am driving immersed in VR, I get a really pleasant feeling. The pleasure is really in being in the car and driving as if I were actually doing it.	Pleasure	Enjoyment	
Interviewee 3	I climbed mountains in virtual reality, and once at the top, I saw the entire landscape around me. It was a really pleasant and beautiful feeling, genuinely real. It was like looking at the scenery live after reaching the summit.	Pleasure		
Interviewee 8	When you are living the experience, you feel a bit of adrenaline, and you are excited.	Excitement		
Interviewee 16	I couldn't believe what I was seeing. It felt like I had been catapulted into the future. It's a feeling of almost bewilderment; initially, you feel excited.	Excitement		
Interviewee 12	Yes, especially in moments when I'm having a lot of fun, it engages me a lot, and I disconnect from the real world.	Fun		
Interviewee 10	I also tend to get less tired when I feel immersed because it leads me to experience it with more fun.	Fun		

Source: Authors' elaboration