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Appearance of Players' Avatars and its Influence on Social Interaction in Metaverse Gaming

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Abstract: Avatars are the virtual identities of humans in virtual environments, and the metaverse makes them more advanced as they can move, dress, and talk like humans. As in real life, humans' nature is social and every aspect of life is related to social interaction, same as the metaverse is designed to be the place of virtual social interaction of avatars, where humans can interact with others via controlling their avatars. Metaverse gaming provides such platforms where users can audibly talk with each other, and this research investigated the appearance of avatars as a richness of communication tool, social actors (avatars), and their influence on social interaction in virtual environments. After spending 100 hours in metaverse gaming environments as an immersive ethnography, this research explored the different visual and customizable aspects of avatar appearance that influence the quality and depth of social interactions and investigated how avatar appearance enhances players' embodied presence, immersion, and recognition of self and others in metaverse gaming. The findings revealed that Avatar customization helps players display their personalities, values, and feelings in a way that makes avatars relatable in contexts of social interaction. Moreover, when players' avatars match their physical or aspirational self-images, they experience a better sense of embodiment.

Key Words: Metaverse Gaming, Appearance of Avatars, Social Interaction, Media Richness, Embodied Social Presence

Introduction

In literature, there is no single definition of avatar, one of the main reasons behind this is the frequently changing dynamics of communication technology. For example, in the beginning, a textual representation or symbol, customized font, 2D picture, and running cartoon in the Super Mario game were considered an Avatar (Shao et al., 2019). Many video games let players choose or create game characters who operate as virtual representations of the players in the game environment, as avatars are game characters that are controlled by the user (Freeman et al., 2020). Avatars are distinguished from computer- or game-controlled characters, which, rather than being commanded by a person, follow the rules stored in their programs. Avatars can be found in first-person shooter games (for example, Call of Duty), racing games (for example, Mario Kart), online virtual worlds (for example, Second Life), life-simulation games (for example, The Sims), and MMORPGs (for example, World of Warcraft; Eve Online) (Guegan et al., 2020). And now the avatars are being used in metaverse social gaming in Recroom, Minecraft, VR Chat, Roblox, and Among Us.

Avatars are often limited to a user's visual representation within a digital system. The interactive and customizable 3D humanoids that exist in online games like World of Warcraft and virtual worlds like Second Life, where players may "embody themselves, and make real their engagement with the virtual world," are referred to as avatars in the context of virtual world research (Lee et al., 2023) .

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Figure 1

Moving Avatars in Metaverse Gaming

In a virtual environment where players search for and accomplish in-game goals, an avatar is a picture of a character that they use to explore and communicate with. Avatars are frequently highly customizable characters that the players themselves create and manage in terms of appearance and behavior while playing the game (Green et al., 2021). An avatar can be considered as a way for a person to transfer their real-world self into a virtual world, serving as both a visual representation of the player and a tool for virtual world manipulation through interaction and communication.

The metaverse, which contains a persistent immersive virtual environment frequently experienced using virtual reality (VR) headsets, is gaining popularity in industry like media and academia. What differentiates these virtual environments and makes it unique is that users can simply change their avatar's appearance and with the press of a button person can be anyone and anywhere (Voinea et al., 2022).

Through technological advancements, the Metaverse creates an immersive virtual world that is parallel to and permanent, modeled after the natural world, and offers users a platform for social, cultural, and recreational activities (Weidner et al., 2023).The Metaverse is a central location for a multitude of virtual online activities. In the virtual world, users can engage in social interaction, entertainment, creation, display, education, and trading, among other social and spiritual activities. Metaverse's primary purpose is to host virtual objects and identities (Peña et al., 2022). Any user can guarantee the results of their labor and contribute to the creation of this strong platform. You can think of the Metaverse as an alternate virtual universe where anything is possible from the real world.

The Metaverse's most popular scene, where users can create virtual identities, is gaming. To reflect the idea of the Metaverse, players can rely on this identity to interact with others in the game (Zhang et al., 2022). There is a significant difference between the game and the Metaverse in terms of accessibility, low latency, immersion, and Metaverse's economic structure. As a result, the game can effectively enter the developed Metaverse through the advancement of the underlying technology (Rashid & Khan, 2024).

Figure 2

Avatars interaction in Metaverse

Avatars in the metaverse enable users to create meaningful connections and mold their digital identities through their distinctive powers of product representation, stage customization, and interactive engagements (Oppermann et al., 2023).Avatars and the metaverse go hand in hand as fundamental elements of the virtual world. The main way that people join the metaverse community, socialize, and engage with each other in

the virtual world is through avatars. They can be imaginative characters or realistic representations, among other things. Users can express who they are and improve the metaverse experience by using avatars (Cheong, 2022).

Avatar is a virtual representation; its resemblance and behavior are very close to like a real person, and it has a pivotal role while interacting in social gaming of the metaverse (ÖZKÖK ŞİŞMAN & BİLGİCİ, 2023). In virtual environments like in Metaverse, Avatars and their appearance can impact on social interaction (Lam, 2022). Exploring the influence of avatar appearance on social interaction in metaverse gaming will provide the in-depth knowledge of how the specific looks of avatars as a tool of communication can boost the sense of presence, feeling realistic (BTB)communication, recognition of digital self and others, goal directed collaborative engagement with other social avatars and appraisal of "real others".

Research Objectives

- To examine how the visual and customizable features of players' avatars enhance the richness of communication and convey social cues in metaverse gaming.
- To explore how avatar appearance shapes players' sense of presence, embodied experiences, and recognition of self and others in metaverse environments.

Research Questions

- How do different visual and customizable aspects of avatar appearance influence the quality and depth of social interactions in metaverse games?
- How does avatar appearance enhance players' embodied presence, immersion, and recognition of self and others in metaverse gaming?

This research contributes to the expansion and advancement of communication theories, particularly Media Richness theory, by examining how the visual characteristics of avatars influence the richness of communication in the metaverse gaming. Understanding how avatar appearance influences the intensity and intricacy of social interactions adds to refining existing communication models. Secondly, by exploring the role of avatar appearance in embodied social presence, the research will support the understanding of the practical aspects of virtual interactions.

Literature Review

Metaverse gaming has revolutionized virtual social interaction, allowing players to explore layered, multi-sensory world. As digital self-representations, avatars facilitate user experiences, communication, and social dynamics within these online spaces. The existing research on the impact of avatar appearance on social interaction, presence and collaboration is critical to understand the larger implications of metaverse gaming for digital identity and social behavior.

Park et al. (2021) discusses how for social interaction more and more people turn to computer media, interactive interfaces, and virtual environments. They also highlight the importance of understanding what avatar appearance makes users feel more present and social in virtual worlds. Such approach suggests that someone ending up somewhere strange — such are the strange, prehistoric, evolutionary behaviors attached to expressing anger, which is also mentioned in the study.

The primary objective of the study was to determine what contributes towards a pleasant metaverse experience. It examined impression management theory explained avatar customization, social engagement, and avatar identification. The sample consisted of 301 metaverse users in total. The present study investigates the relationship between avatar identification and enjoyment, also testing the moderators of avatar customization and social engagement. The results indicated that social engagement mediated the effect of avatar identification on metaverse participation enjoyment. The research also uncovered an additional moderating effect, which highlighted that the level of avatar personalization played a role in the relationship between avatar identification and metaverse enjoyment (Ki et al., 2023).

So, avatars for virtual events in the metaverse are the main core features that create more user satisfaction and involvement. Depending on the nature of the event, participants can design either more or less formal avatars. Avatars should be more formal for utilitarian experiences but should be less formal in the context of hedonic experiences. How it Affects Users Without Limits Users are able to customize their avatar in terms of the way it looks and looks, and all this contributes to the relationship that a user feels with the avatar. Ease and customization of the system have further enhanced the satisfaction level, and it suggests that functionality aspects are important to ensure that the attitude of users for metaverse-based events will remain positive (Park & Kim, 2023).

Lee et al. (2023) 's research explores the importance of understanding how people use virtual reality to learn and connect with others. It also emphasizes the application of the Transformed Social Interaction paradigm, which entails analyzing avatar environments and identities over time. Avatar similarity's effects on synchrony and nonverbal behaviors, the impact of visible space and environmental settings on group dynamics, and the significance of nonverbal dynamics and group processes in virtual environments are also covered in the review. The review also emphasizes the special opportunity that arises from researching people who adapt to new technologies and are frequently exposed to media stimuli.

The study examined the effects of utilizing Microsoft HoloLens 2 on the driver's social presence when operating an autonomous driving system in a Metaverse-based collaborative mixed reality environment. In the study, social presence was compared in two different contexts: mixed reality collaboration (using Microsoft Mesh on HoloLens 2) and baseline (using Skype/Meet on a tablet). While keeping an eye on the vehicle's behavior, the participants engaged in social interaction tasks and a remote collaborative game. The study discovered notable variations in social presence metrics, as participants interacted with avatars in the mixed reality setting with ease. This research could be extended to evaluate driver performance in autonomous driving systems during handover processes (Nan et al., 2023).

More people are using virtual avatars to express their identities as a result of the growth of metaverse technology and virtual avatars. Enhancing virtual characters' realistic expressions and nonverbal cues has been the focus of research. On the other hand, little is known about how avatars can represent a user's distinct expressions. Based on the user's facial features, this study determined the variables influencing how customized virtual avatars are perceived by others. Avatars that embodied their regular expressions were perceived by participants as being more like them, and avatars that embodied their appearance as more recognizable. To appropriately reflect the user's identity and facilitate a sense of connection between the user and their avatar, designers ought to take into account how users view customized virtual avatars (Ki et al., 2023).

Two experiments were conducted to examine the impact of avatar facial characteristics on body ownership, avatar attractiveness, social presence, and teamwork in immersive virtual environments. In experiment 1, differences in attractiveness and collaborative task completion time were shown, but there were no differences in body ownership or social presence. Surprisingly, performance was found to correlate with avatar attractiveness: the more attractive the avatar, the shorter the time to completion. Using the same avatars, the second experiment looked into how the task affected social presence even more. There were no appreciable variations between the avatars, despite the high levels of social presence in both tasks. The two sorts of tasks differed significantly, though, with higher scores for social presence in negotiation tasks. This implies that social presence depends on the nature of the task, particularly in immersive collaborative virtual environments where nonverbal communication plays a significant role (Yim & Chang, 2023).

In order to construct believable multi-user scenarios in virtual environments, social presence must be established. In virtual environments, users can communicate with one another through avatars (Rashid & Ansari 2024). According to a study, social presence was significantly impacted by the kind of collaborative task being done (asymmetric collaboration versus negotiation), but non-human avatars' facial features had no discernible effect(Sterna & Zibrek, 2021).

Avatars' appearance in a digital environment can affect subsequent behaviors, as evidenced by recent experimental studies. Nevertheless, these studies frequently ignore in-game behavior in favor of concentrating only on

avatar appearance. This article describes an experiment that investigates how in-game behavior and avatar appearance interact to influence prosocial behavior later on. In the study, 120 undergraduate students from a course on medicine and health sciences engaged in role-playing, facing off against rivals known as "mobs" along the way. The findings demonstrated that prosocial behavior in a subsequent unrelated task was influenced by the appearance of the mobs rather than the avatar appearance. Compared to those who faced positive-looking mobs, participants who faced negative-looking mobs tended to behave more prosocially. affect the way that users behave in the future. These results are discussed in terms of self-perception, theoretical understanding, and Proteus effect research. Users' subsequent behavior is affected by these findings (Oh et al., 2023).

The study investigates the relationship between users' commitment to virtual communities and media richness theory. The study, which employed structural equation modeling, discovered that personal focus and quick feedback have a positive impact on message certainty and unequivocality, which in turn influence commitment to online game virtual communities. In the context of virtual communities, this is the first study to formally incorporate and test the fundamental (Mammadov, 2022).

Mennecke and his research fellows introduced the embodied social presence (ESP) theory, which emphasizes avatars as social interaction mediators in virtual worlds. The occurrence of specific acts of communication and engagement in the setting of embodiment provides a sense of presence that is derivative of human cognition and parallel to real-world encounters. The idea states that in a virtual environment, users must first feel the existence of their own avatars, then interact with other avatars to feel a common existence with others and produce a sense of social presence in the virtual world. To attain ESP, however, a person must first achieve a sufficient level of perceived presence and co-presence (Mennecke et al., 2011).

Avatars' effects on social interaction, personality creation, and user engagement are highlighted in the body of existing literature on metaverse gaming. However, major study gaps remain, notably considering the complex ways avatar appearance affects communication richness, sensation of existence, and interaction in gaming environments.

Research Method

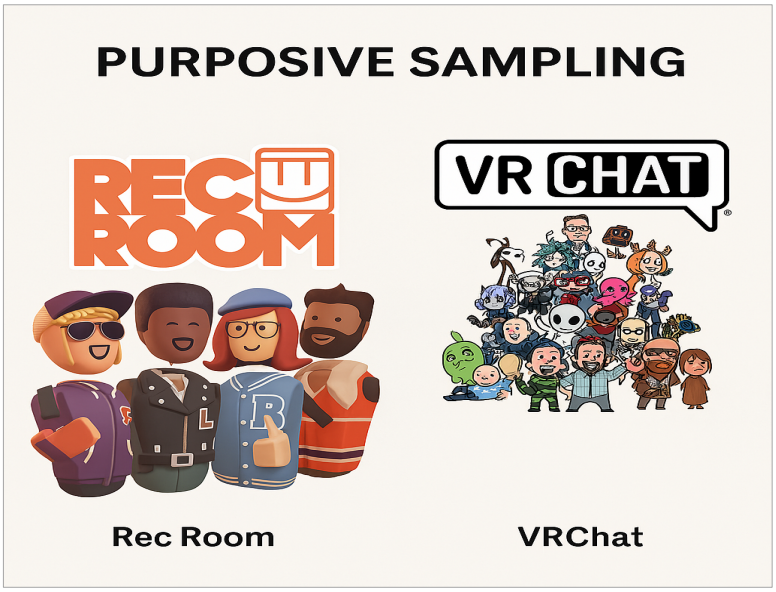
Metaverse gaming is not like traditional gaming, even though it is more advanced than virtual gaming. Virtual gaming dominates traditional gaming because it offers a more advanced playing experience, millions of people connect through virtual worlds, advancing technology and creating new economies while posing issues with "intellectual property, free speech, and law." One step ahead, metaverse gaming is more immersive and interactive, having audio communication facilities among the social actors (Avatars) like people used to communicate in real world. Millions of people spend hours one a daily basis in metaverse gaming and building relationships and communities for living there and spending quality of time. The significance of metaverse gaming is vast. The researcher has adopted virtual ethnography for identifying the appearance of avatars on social interaction, as detailed observations, participation, and communication is required.

There are several approaches to conducting this research. Ethnographic research is the most effective way to collect data from the virtual world community to obtain the most accurate information possible(Hine, 2018). Virtual ethnography is, however, the most effective method of information gathering when working with virtual communities. An important contribution to the field of research is ethnography(Karhulahti et al., 2022).

The research employed purposive sampling as the primary technique for selecting participants and virtual environments, aligning with the goals of immersive ethnography. Purposive sampling is a non-probability method where participants and settings are intentionally chosen based on their ability to provide rich, relevant data to address the research questions (Morgan, 2018) . In this study, the metaverse games Rec Room and VR Chat were selected because of their active user bases, diverse customization options for avatars, and vibrant social interaction dynamics, which provided fertile ground for exploring the role of avatars in shaping social interactions.

Figure 3

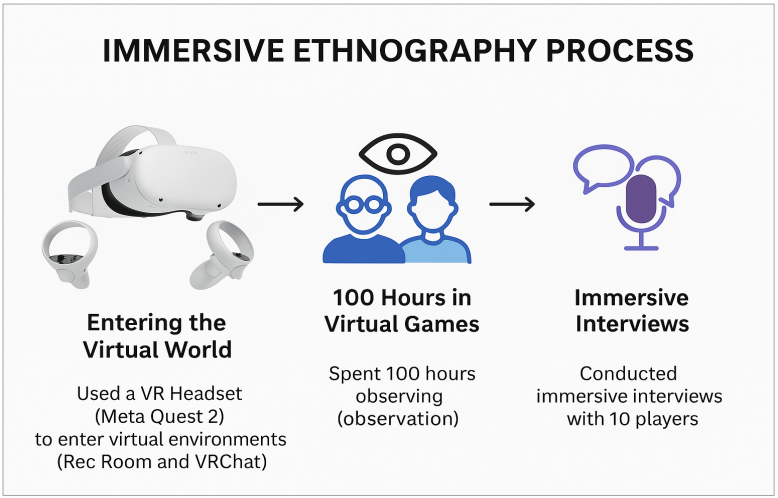
Selected Games for Immersive Ethnography



The sample size consisted of participants who were observed and interviewed during 100 hours of immersive ethnographic engagement in these virtual environments. Immersive interviews were conducted with a purposive subset of participants who demonstrated diverse avatar designs and actively engaged in social interactions. The aim was to include participants with varying levels of expertise, cultural backgrounds, and gaming objectives to capture a broad spectrum of experiences and perspectives. This approach ensured the study focused on individuals most likely to provide insights into how avatars function as social actors and rich communication tools.

Figure 4

Process of Immersive Ethnography



Data Collection Procedure

The data has been collected during the immersive ethnography via Meta Quest 2, a VR headset for entering the immersive environment with a mic and speaker. The researcher observed all the activities done by the players and interacted with them through the same device. The process of immersive interviews has also been conducted through this device, and questionnaires were prepared accordingly.

The data collection process for this research was guided by the principles of immersive ethnography, which emphasizes prolonged engagement within the research environment to understand participants' lived experiences and cultural practices (Joseph, 2015). Having determined the sample size and setting 100 hours of immersive engagement

in the metaverse games Rec Room and VR Chat, the methodology was designed to capture rich, contextualized data through a combination of participant observation and immersive interviews.

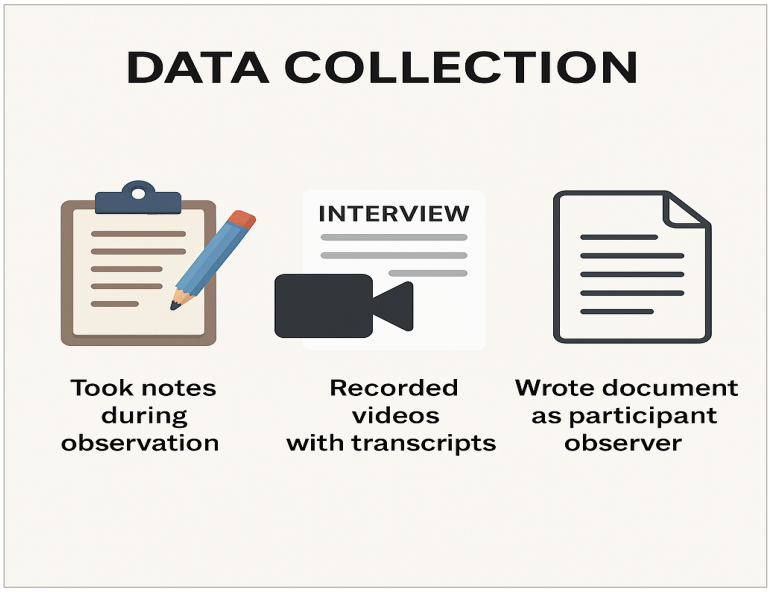
Unlike traditional virtual ethnography, research was used to collect the notes and ask participants written questions and was then analyzed manually. The researcher recorded the observation as well as wrote it down while ending the game. However, interviews in an immersive environment were recorded in video form. The researcher wrote the document as a participant observer and recorded videos with transcripts.

Ethical Considerations

Social interaction in the virtual world via avatar and spending time in Metaverse games was an interesting and new experience. But there are some ethical considerations while conducting this research. First, in metaverse gaming, there is no nudity; avatars do have clothing and dresses. Avatars also have privacy; no avatar can touch or get too close to another avatar. The researcher joined teams and made friends just for observing and investigating of the objectives of this research. For the interviews, proper consent and permissions have been taken from the players, and their real identity was not asked. The researcher has taken proper care of communication ethics; for example, no abusive language, hate speech towards other avatars' ethnic costumes, racist comments toward skin tone of avatars and no mocking of others' national dress of avatars. The researcher was not involved in harassment towards the opposite gender avatars.

Figure 4

Process of Data Collection

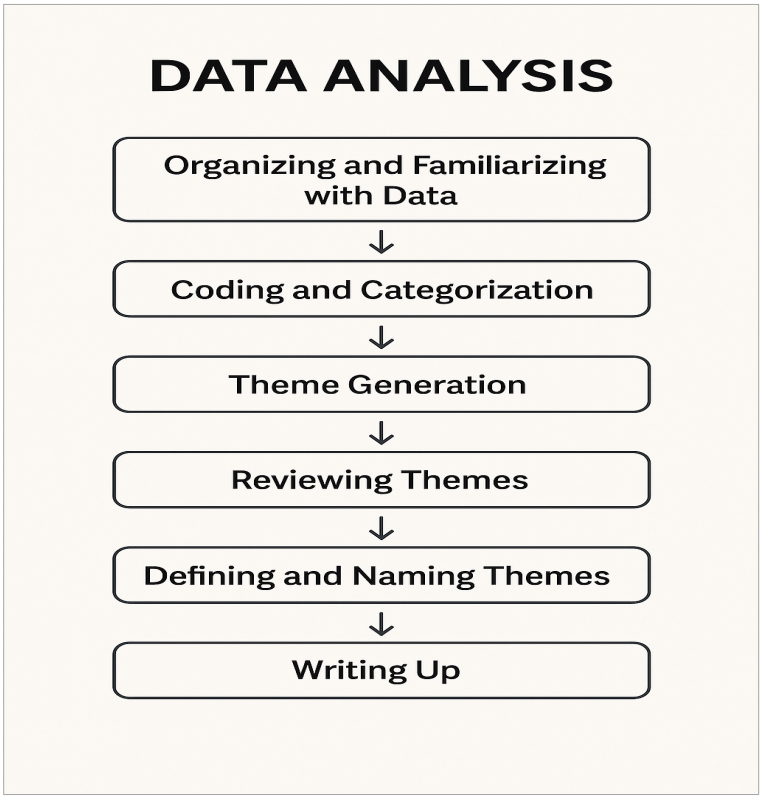


Data Analysis Procedure

The data analysis process for this study was based on a thematic analysis approach, which began with organizing and becoming acquainted with the data. The first step included reading through and rereading observation notes, written responses, and interview transcripts to form an overall grasp of the gathered material. Meaningful data segments were also coded and categorized, such that patterns started to emerge during the coding and categorization phase. These codes were then combined into larger categories during theme generation, mirroring repeated ideas or concepts. Next, a review of themes ensured that the themes adequately reflected the data set and were internally coherent. The researcher then progressed to the stage of defining and naming the themes, which involved developing a detailed analysis of each theme and determining how it related back to the research questions. Finally, in the writing up phase, the themes were integrated into a coherent narrative supported by direct quotes and observations, providing rich insight into the immersive ethnographic experiences within the VR platform.

Figure 5

Steps of Data Analysis



Themes related to the first research question were extracted as the first one "Expression of Identity through Customization". Avatar customization helps players display their personalities, values and feelings in a way that makes avatars relatable in contexts of social interaction. Second theme was "Social Signaling via Visual Features" Certain visual details (like clothes, accessories, poses, or animations) are markers of status or expertise or culture, affecting the quality of discourse. And third one is "Visual Cues and Interaction Depth." Players report that avatars with more expressive or detailed designs foster richer conversations and deeper connections compared to generic avatars

However, "Avatar Realism and Immersion" A realistic avatar helps the overall immersion of the experience, making the players feel more physically in that world, was the first theme related to the second question. And second was "Embodied Self-Representation." When players' avatars match their physical or aspirational self-images, they experience a better sense of embodiment.

Expression of Identity through Customization

The ability to customize avatars allows players to express their identities in ways that resonate with their personal experiences, values, and emotions. Many players noted that selecting specific hairstyles, clothing, and accessories enabled them to convey aspects of their personality that might not be immediately visible in real life. This helps to create a more engaging and relatable experience in social contexts, as other players tend to interact more with avatars that possess distinctive features or similar attributes. One participant noted, for instance, that by opting for brighter colors and fun designs in their avatar, they were able to convey their happy-go-lucky personality and invite their friends to talk to them. The player said that "I designed my avatar to have bright, neon-colored hair and tattoos because that's how I see myself in real life. Talking to others in the game makes me feel more confident."

Visual Cues and Interaction Depth

The more elaborate and versatile an avatar can be, the deeper and higher quality the social experience in metaverse games. Some intrinsic properties of avatars with rich visual details and dynamic features resulted in more engaging conversations and helped participants form deeper connections with other users. For instance, a dynamic avatar with animated facial expressions or gestures would enable players to express emotions more quickly, allowing players to communicate in a way closer to real life. One of the participants said that "I find it easier to connect with people whose avatars have facial expressions and gestures. It makes conversations feel more real."

Simple avatars contribute to a less compelling sense of presence and realism within the metaverse. Participants often said that avatars with realistic movements, textures, or expressions helped the virtual environment feel more immersive. This increased sense of being in the same space often resulted in deeper conversations, with players feeling more in tune with one another and sharing a sense of virtual reality as they inhabited many of the same spaces together. One participant described how an avatar with subtle eye movements and hand gestures made conversations feel more

natural and engaging, enhancing their overall gaming experience. "A plain avatar with no detail feels like talking to a bot. But when someone puts effort into their design, it shows they are engaged and want to interact."

Avatar Realism and Immersion

"The first time I used a realistic avatar with body tracking, I felt like I was inside the game. It completely changed how I interacted with people."

How realistic avatars make the players feel more immersive in the metaverse. How realistic and detailed avatars appeared was one of those criteria that participants stressed as an enabler for their perception of being fully present in the virtual environment. Realistic facial expressions, fluid body movements, and intricate textures all contribute to a feeling of continuity between the virtual and physical worlds. One participant shared that using an avatar with realistic eye contact and subtle micro-expressions significantly improved their sense of connection during conversations, making the virtual interactions feel as authentic as face-to-face communication.

Embodied Self-Representation

"I made my avatar look like me, and it helps me feel more like myself when I interact with people. It's like I'm present in the game."

The alignment of avatars to the physical or aspirational self-image of players promotes a stronger sense of embodiment during metaverse gaming. Taraps also often talked about how bringing their avatar in line with their appearance in real life or to the traits they aspire to in real life made them feel more connected to their update digital self. One participant reported that creating an avatar with a face shape or body proportions akin to their own body made them feel as if they were anchored in the virtual environment and their corporeal body extended into the environment.

Mutual Recognition and Social Presence

Mutual recognition in the metaverse becomes more effective when the avatars represent different identity profiles and are recognizable as such, and this visual distinctiveness greatly contributes to promoting and cultivating a strong sense of social presence in the metaverse. When designed with distinctive or culturally representative components of individuals, avatars were more easily identifiable, which allowed participants to connect with each other sooner rather than later. Another way to get your message across was through avatar designs and the first step at that was clothing, one player explained how adding traditional clothes to their avatar gave the opportunity and the jumping off point for a discussion that led to an exchange of cultural heritage and the forming of a sense of understanding and respect for one another. The player said "I recognize my friends instantly by their avatars, even if they change clothes. Their unique style makes them stand out."

Theoretical Contributions

Advancing self-recognition and mutual understanding, avatars are extensions of users' identity, which is proved by the themes as follows: "Expression of Identity through Customization"; "Embodied Self-Representation. Avatars mirror users' desires and personalities, allowing for real-world engagement across screens and environments, facilitating genuine and immersive experiences. By reflecting users' aspirations and personal traits, avatars bridge the gap between physical and digital presence, fostering authentic and immersive interactions. These insights expand the scope of Embodied Social Presence Theory by illustrating its applicability to metaverse gaming environments, where visual and customizable elements of avatars deepen social connections.

This research also validates and extends the Media Richness Theory. The study found that avatars are rich communication tools that contain multiple cues that increase interactivity and immediate feedback and personalization. Aspects such as "Social Signaling via Visual Features" and "Visual Cues and Interaction Depth" emphasize how avatars mediate subtle non-verbal information like social status, expertise, and emotional expressions. These findings underline

the importance of avatar design in augmenting communication richness, demonstrating that virtual environments can achieve levels of interpersonal interaction comparable to face-to-face communication when designed effectively.

Methodological Contributions

Their immersive ethnography approach can be considered as a novel methodological contribution to the fields of media and communication research. Immersing the researcher (rather than cramming scrutable gamification into the environments) for 100 hours in the virtual worlds of Rec Room and VR Chat, this methodology generated rich, situated data that would be unattainable for observational methodologies. Although previous research used interview-based methods to study the same phenomena, the real-time aspect of immersive ethnography allowed observations of in-game player behaviors, social dynamics, and avatar interactions, yielding insights into the lived experiences of players ultimately unavailable through interview methods.

Incorporating immersive interviews also added a methodological aspect that allowed participants to describe their experiences within their virtual space. By combining observation of the avatars with direct feedback from participants, it created a comprehensive perspective of the relationship between the appearance of the avatar and social interaction. While not without limitations, the success of this approach highlights potential for applying this methodology to other areas of virtual and augmented reality research, providing a platform to study more complex, immersive phenomena as they unfold in real-time.

Conclusion

This paper derives a holistic insight into avatars as social actors as well as rich communication carriers in metaverse gaming contexts. By elucidating the interplay between theoretical paradigms such as Embodied Social Presence Theory and Media Richness Theory through an innovative methodological lens, this study has important implications for media, communication, and digital anthropology. These insights highlight the power avatars can have on facilitating social connection, self-expression, and inclusivity in online realms. This research constitutes a preliminary investigation into avatar-based interactions in the expanding metaverse, with implications for communication, identity and society in general as the metaverse develops over time. Over the theoretical, methodological, and practical sides, this research is expected to highlight future research directions and stimulate innovation opportunities in virtual environment related domains which become growing even further.

Limitations and Future Directions

While this research provides valuable insights, it is not without limitations. The study focuses on two metaverse platforms (Rec Room and VR Chat), which may not fully represent the diversity of virtual environments. Future research could expand to include other platforms and examine cross-platform interactions. Additionally, while immersive ethnography offers depth, it is time-intensive and context-specific, limiting the generalizability of the findings.

Future studies could explore: The long-term impact of avatar-based interactions on users' real-world behaviors and relationships. The role of artificial intelligence in enhancing avatar functionality and communication richness. Cross-cultural comparisons of avatar use and perception in different regions and communities.

References

Cheong, B. C. (2022). Avatars in the metaverse: potential legal issues and remedies. *International Cybersecurity Law Review*, *3*(2), 467–494. https://doi.org/10.1365/s43439-022-00056-9

Green, R., Delfabbro, P. H., & King, D. L. (2021). Avatar identification and problematic gaming: The role of self-concept clarity. *Addictive Behaviors*, *113*. https://doi.org/10.1016/j.addbeh.2020.106694

Guegan, J., Nelson, J., Lamy, L., & Buisine, S. (2020). Actions speak louder than looks: The effects of avatar appearance and in-game actions on subsequent prosocial behavior. *Cyberpsychology*, *14*(4), 1–16. https://doi.org/10.5817/CP2020-4-1

Hine, C. (2018). *Virtual Ethnography*. SAGE Publications Ltd. https://doi.org/10.4135/9780857020277

Joseph, K. (2015). *Communication Of Self and Cyberlife Through Avatars in Second Life Online Communities*. https://digitalcommons.utep.edu/open_etd/1078

Karhulahti, V. M., Kauraoja, V., Ouninkorpi, O., Perttu, S., Perälä, J., Toivanen, V., & Siutila, M. (2022). Multiverse ethnography: A qualitative method for gaming and technology use research. *Journal of Gaming and Virtual Worlds*, *14*(1), 85–110. https://doi.org/10.1386/jgvw_00053_1

Ki, C.-W. C., Youn, S.-Y., & Ha, S. (2023). METAVERSE AND FASHION CONSUMERS: EXPLORING THE MEANINGS CONSUMERS ATTACH TO THE METAVERSE, AVATARS, AND DIGITAL FASHION. *Global Fashion Management Conference*, 209–213. https://doi.org/10.15444/GMC2023.03.03.04

Lam, K. Y. Y. L. A. A. L. L. H. T. G. (2022). Human-Avatar Interaction in Metaverse: Framework for Full-body Interaction. *MMAsia '22: ACM Multimedia Asia, Tokyo, Japan, 13 - 16 December 2022*.

Lee, H. W., Chang, K., Uhm, J. P., & Owiro, E. (2023). How Avatar Identification Affects Enjoyment in the Metaverse: The Roles of Avatar Customization and Social Engagement. *Cyberpsychology, Behavior, and Social Networking*, *26*(4), 255–262. https://doi.org/10.1089/cyber.2022.0257

Lee, J. H., Lee, T. S., Yoo, S. Y., Lee, S. W., Jang, J. H., Choi, Y. jin, & Park, Y. R. (2023). Metaverse-based social skills training programme for children with autism spectrum disorder to improve social interaction ability: an open-label, single-centre, randomised controlled pilot trial. *EClinicalMedicine*, *61*. https://doi.org/10.1016/j.eclinm.2023.102072

Mammadov, R. (2022). Media Choice in Times of Uncertainty & Media Richness Theory in Context of Media Choice in Times of Political and Economic Crisis. *Advances in Journalism and Communication*, *10*(02), 53–69. https://doi.org/10.4236/ajc.2022.102005

Mennecke, B. E., Triplett, J. L., Hassall, L. M., Conde, Z. J., & Heer, R. (2011). An examination of a theory of embodied social presence in virtual worlds. *Decision Sciences*, *42*(2), 413-450. http://dx.doi.org/10.1111/j.1540-5915.2011.00317.x

Morgan, R. (2018). *Virtual reality: an ethnographic study of sociality, being, and money in a multi-player online game-world*. http://researchonline.jcu.edu.au/41004/

Nan, D., Sun, S., Jansen, B. J., & Kim, J. H. (2023). Beyond Avatar Coolness: Exploring the Effects of Avatar Attributes on Continuance Intention to Play Massively Multiplayer Online Role-Playing Games. *International Journal of Human-Computer Interaction*. https://doi.org/10.1080/10447318.2023.2278941

Oh, S., Kim, W. Bin, & Choo, H. J. (2023). The Effect of Avatar Self-Integration on Consumers' Behavioral Intention in the Metaverse. *International Journal of Human-Computer Interaction*. https://doi.org/10.1080/10447318.2023.2279416

ÖZKÖK ŞİŞMAN, Ö., & BİLGİCİ, C. (2023). From Social Media to Metaverse: Evaluation of Meta Avatars Store in The Context of Avatars, Self-Presentation and Luxury Brand. *TRT Akademi*, *8*(17), 38–65. https://doi.org/10.37679/trta.1208292

Park, J., & Kim, H.-Y. (2023). AVATARS AS COPING MECHANISMS FOR DISSATISFIED BODY IMAGE: A SNAPSHOT OF GENERATION Z CONSUMERS IN THE METAVERSE. *Global Fashion Management Conference*, 914–915. https://doi.org/10.15444/GMC2023.11.06.01

Park, S., Kim, S. P., & Whang, M. (2021). Individual's social perception of virtual avatars embodied with their habitual facial expressions and facial appearance. *Sensors*, *21*(17). https://doi.org/10.3390/s21175986

Peña, J., Craig, M., & Baumhardt, H. (2022). The effects of avatar customization and virtual human mind perception: A test using Milgram's paradigm. *New Media and Society*. https://doi.org/10.1177/14614448221127258

Rashid, M., & Khan, M. (2024). Metaverse as Medium: Understanding the Revival of McLuhan's Notion'Medium is the Message'in the Emergent Virtual Reality Landscape. *Journal of Communication and Cultural Trends*, *6*(1), 87–108. http://dx.doi.org/10.32350/jcct.61.05

Rashid, M., Zeb, J., & Ansari, N. A. (2024). Communicative Affordances of Virtual Reality for Special Education: A Systematic Review. *The Regional Tribune*, *3*(1), 68–82. https://doi.org/10.63062/trt/V24.021

Shao, Y., Lessio, N., & Morris, A. (2019). IoT avatars: Mixed reality hybrid objects for core ambient intelligent environments. *Procedia Computer Science*, *155*, 433–440. https://doi.org/10.1016/j.procs.2019.08.060

Sterna, R., & Zibrek, K. (2021). Psychology in Virtual Reality: Toward a Validated Measure of Social Presence. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.705448

Voinea, G. D., Gîrbacia, F., Postelnicu, C. C., Duguleana, M., Antonya, C., Soica, A., & Stănescu, R. C. (2022). Study of Social Presence While Interacting in Metaverse with an Augmented Avatar during Autonomous Driving. *Applied Sciences (Switzerland)*, *12*(22). https://doi.org/10.3390/app122211804

Weidner, F., Boettcher, G., Arboleda, S. A., Diao, C., Sinani, L., Kunert, C., Gerhardt, C., Broll, W., & Raake, A. (2023). A Systematic Review on the Visualization of Avatars and Agents in AR & VR displayed using Head-Mounted Displays. In *IEEE Transactions on Visualization and Computer Graphics* (Vol. 29, Issue 5, pp. 2596–2606). IEEE Computer Society. https://doi.org/10.1109/TVCG.2023.3247072

Yim, Y. S., & Chang, W. (2023). SAD AVATARS AS BETTER SALES REPRESENTATIVES IN THE METAVERSE? THE ROLE OF SUBCULTURAL APPEAL. *Global Fashion Management Conference*, 113–113. https://doi.org/10.15444/GMC2023.02.03.06

Zhang, G., Cao, J., Liu, D., & Qi, J. (2022). Popularity of the metaverse: Embodied social presence theory perspective. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.997751

Freeman, G., Zamanifard, S., Maloney, D., & Adkins, A. (2020, April 25). My body, my avatar: How people perceive their avatars in social virtual reality. *Conference on Human Factors in Computing Systems - Proceedings*. https://doi.org/10.1145/3334480.3382923

Oppermann, L., Buchholz, F., & Uzun, Y. (2023, April 19). Industrial Metaverse: Supporting remote maintenance with avatars and digital twins in collaborative XR environments. *Conference on Human Factors in Computing Systems - Proceedings*. https://doi.org/10.1145/3544549.3585835