

Examining the influence of avatar identification on sharing intention in the metaverse: The mediating role of immersion and moderating effect of perceived social distance

Jaehyuk Choi,

University of Southern California

Youngkeun Choi¹,

Sangmyung University

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Abstract

This study aims to investigate the impact of avatar identification on the intention to share by examining the mediating role of user immersion and the moderating effect of perceived social distance. For this, we collected 228 higher education students in South Korea through a survey and used hierarchical regression with SPSS 24.0. In the results, first, it showed that participants who perceived higher levels of similarity identification, wishful identification, and embodied presence in their avatars in the metaverse platform were more immersed in their avatars. Second, participants who perceived greater embodied presence in their avatars had a stronger intention to share their avatars through immersion. Finally, the positive relationship between perceived embodied presence and immersion was more significant for participants in metaverse platforms with higher perceived social distance compared to those with lower perceived social distance. This study is the first to examine the integral model of avatar identification factors in the metaverse platform. And, this study's results show the mechanism by which avatar identification enhances the intention to share.

¹ Corresponding author:

Youngkeun Choi, Sangmyung University.

E-mail: penking1@smu.ac.kr

Keywords

Avatar identification, similarity identification, wishful identification, embodied presence, immersion, intention to share.

Introduction

The spread of COVID-19 has deeply embedded the concept of “untact” or non-face-to-face interactions into daily life. As education transitioned to online classes and companies adopted remote work, various untact technologies became an essential part of everyday routines. In particular, Fourth Industrial Revolution technologies, such as artificial intelligence and virtual reality, have enabled sophisticated non-face-to-face environments, ushering in the era of the metaverse – a transcendent 3D virtual space where users can engage in daily and economic activities through avatars (Feng et al, 2022). The metaverse can be described as a three-dimensional virtual space where avatars are used to participate in creative, economic, and interactive activities, offering a 3D virtual space in which users, represented by avatars, can engage in diverse activities and interactions (Kozinets, 2023). Within this environment, users perceive avatars as extensions of themselves, a perception that strengthens their identification with their avatars.

Avatars play a central role in facilitating user interactions within the metaverse, especially through game and communication mechanisms. Users express individuality by consuming fashion items, interact with others, and form virtual communities, which fosters a sense of belonging and blurs the boundaries between the virtual and real, ultimately enhancing user experience (Hirsch, 2022; Chetoui, 2020; Haji et al, 2021). This unique environment has led companies to devise strategies that heighten brand awareness by offering distinct experiences within the metaverse, encouraging users to make real-world purchases and share their experiences with others (Kozinets, 2023; Carson et al, 2019).

Accordingly, the need to study the relationship between avatar identification and the intention to share has intensified. The COVID-19 pandemic has entrenched untact interactions in everyday life, creating a new reality where users engage in personal and economic activities through avatars in 3D virtual spaces like the metaverse. Structured as an extension of the real world, the metaverse allows users to express themselves through avatars, interact with others, and form virtual communities, enhancing their sense of belonging. These dynamics foster a strengthened identification with their avatars, which can ultimately increase user immersion and positively impact the intention to share experiences.

However, understanding user immersion and avatar identification within the metaverse remains limited. From the user's perspective, it is crucial to comprehend the potential and practical applications of the metaverse. As primary elements of the metaverse, avatars play a significant role in shaping users' immersion and attitudes toward the platform (Habil et al, 2023). Yet, prior studies have generally focused on user reactions to avatars or treated avatar identification as a single dimension, revealing limitations in understanding the influence of avatar identification on user immersion (Cowan et al, 2019; Teng, 2021). Additionally, research emphasizing personal characteristics and social functions within the metaverse is limited, leaving the influence of avatar identification on immersion insufficiently explained.

This study draws on the theoretical frameworks of Social Identity Theory (SIT) and intersectionality to explore the dynamics of social identities in digital environments. Social Identity Theory offers a basis for predicting in-group and intergroup behavior, positing that an individual's belonging to a social group shapes interaction with both members and non-members (Hogg, 2006). This study expands on the concept that individuals' interactions are contingent on identifications with social groups, particularly recognizing that online identities can significantly diverge from real-life identities. This phenomenon of adaptable digital identities intersects with the concept of intersectionality, which emphasizes the role of multiple, intersecting identities, such as gender and ethnicity, in shaping social inclusion or exclusion (Dill, & Zambrana, 2009).

Beyond simply contextualizing the mechanisms of social privilege or oppression arising from demographic intersections, intersectionality also serves as a framework for promoting political change across national and global contexts (Ngan-Ling Chow, Texler Segal, & Tan, 2011). Social Identity Theory and intersectionality are rarely linked due to epistemological and methodological differences; SIT emphasizes cognitive processes governing group relations, while intersectionality often focuses on social and political statuses from a feminist perspective (Warner, 2008; Taksa, Powell, & Jayasinghe, 2015). However, this combined framework allows for a comprehensive analysis of social identities, examining self-identification and autonomy alongside group identification and social influence.

Based on this theoretical background, this study seeks to address these limitations by analyzing the effects of avatar identification on user immersion and perceived social distance among users who utilize branded items in the metaverse. Specifically, this study investigates how detailed factors of avatar identification influence the intention to share by examining the mediating

role of user immersion and the moderating effect of perceived social distance.

Theoretical background and hypothesis development

Social identity theory for avatar in metaverse

In internet-based communities, online identities are integral in shaping group memberships and influencing group-related attitudes. Online identities may exhibit varying degrees of alignment with offline identities, and discrepancies can arise due to the social structure of online communities, the technical affordances of platforms, or individual choices, such as the decision to disclose or conceal specific demographic markers (AltspaceVR, 2020). Interactions in social VR environments are typically mediated through avatars, which vary in fidelity, detail, and communicative capability according to each platform's design principles and intended purpose. For example, Virbela, a professional virtual reality platform, encourages users to present themselves in business-appropriate avatars, disclose their real names, and identify professional affiliations. In contrast, AltspaceVR, which hosts popular culture events and leisure activities, allows for greater personal freedom in avatar representation, facilitating expressions of social identities through "imaginative combinations" by providing diverse body types, accessories, and skin tones, including unconventional colors such as pink and green (AltspaceVR, 2020).

Constructed personas or "technoselves" in online spaces, as Luppicini (2012) notes, incorporate both visual elements and a range of verbal and textual attributes, such as names or pseudonyms, enabling users to experiment with identities in ways that may complement, alter, or obscure their offline identities (Marciano, 2014). For instance, an avatar may reflect gender or ethnic identifiers different from the user's offline characteristics, potentially leading to a decoupling from offline identity and facilitating a more flexible navigation across social groups (Taksa et al, 2015). This flexibility of digital identities diverges from traditionally static conceptions shaped by external social, geopolitical, and cultural forces and underscores the role of context in identity formation.

The contextual nature of identity, pivotal in both individual and collective identity formation, aligns virtual identities with an intersectional approach. Social Identity Theory (SIT) contends that individuals may hold multiple social identities simultaneously, which may become more or less salient depending on the social context (Hogg, 2006). While SIT is effective in explaining the cognitive processes that shape an individual's perception of social relations within groups,

it does not address the overlapping social categories and power structures that can shape group dynamics. Intersectionality, however, provides a framework for examining how apparent demographic characteristics influence privileges and disadvantages within online spaces (Dill, & Zambrana, 2009).

In particular, intersectionality, rooted in feminist and Black feminist theories, emphasizes how multiple intersecting social identities can amplify discrimination (Davis, 2008). For example, women from minority backgrounds may experience discrimination based on both gender and race. Attempts have been made to integrate SIT and intersectionality; the concept of identity salience, for instance, has been applied to contexts of inclusion and discrimination, suggesting that in certain contexts, the most salient identity, such as race or gender, may drive social behaviors more than other characteristics (Holvino, 2012). Integrating SIT and intersectionality offers a more nuanced understanding of the self, transcending the atomistic view of identities as isolated elements that emerge only under specific triggers (Taksa et al, 2015).

Goffman's theory of context-dependent identity presentation, where individuals adapt their behaviors to different social scenarios, also informs this discussion (Goffman, 1986). Identity presentation in digital contexts extends beyond behavior to include decisions around avatar appearance and interactions that align or contrast with the platform's social expectations and technical affordances (AltspaceVR, 2020). The freedom for avatar customization in VR platforms like AltspaceVR, where users can alter body shape, skin color, and other visual features, serves as an example of how such platforms encourage identity expression within a safe and comfortable environment, potentially reducing biases tied to real-life characteristics. This example illustrates how online platforms' technical structures, from avatar design to communication mechanisms, shape social behaviors and the visibility of identity markers, thus influencing users' social interactions within digital communities (Marwick, 2013).

As advanced information and communication technology and virtual implementation technology are integrated into the metaverse, it is transforming into a space for consumers' daily, economic, and cultural activities, enabling innovative driving forces. Retail companies have sought to understand the metaverse to secure future competitiveness, and research that was limited to the initial concept of the metaverse has expanded to explore new conceptualization, case studies, and marketing application possibilities based on technological advancements. In today's highly developed technology and industry, the metaverse is presented as a complementary space to reality that can play an

important role in our daily lives as its ecosystem expands. In modern times, the metaverse can be defined as an expansive fusion world that mediates and combines real and virtual spaces through realistic technology (Batat, & Hammedi, 2023), and is dealt with as a concept that is distinct from the comprehensive cyberspace reflecting the entirety of online activity, given that it enables value creation through users' social, economic, and cultural activities (Dionisio et al, 2013). In other words, the metaverse can be described as a three-dimensional virtual space where avatars are used to engage in creation, economic, and interactive activities (Buhalis et al, 2023).

In the early days of avatars, they were represented in various forms such as animals, humans, and abstract shapes. However, as online interactions became more diverse and to facilitate smooth communication between people, avatars became popularized in a more human-like form (Forster, 2022). In other words, the initial definition of an avatar can be described as a computer-generated image that represents a user in online interactions (Nowak, & Rauh, 2005). Users of metaverse platforms decorate their avatars to reflect their physical appearance as well as fashion style (Batat, & Hammedi, 2023), as there is a tendency to express themselves in a way that can garner favor through the appearance and fashion style of their avatars (Gabrielli et al, 2013). The appearance of an avatar may reflect the user's actual appearance, but it can also be represented differently from reality, allowing users to enjoy deviation or experience vicarious satisfaction (Li et al, 2018). For example, the metaverse platform, Zepeto, provides a service that recognizes the user's face through a camera and creates an avatar that is similar to the user's actual appearance but also allows users to modify features such as appearance, gestures, and fashion to create their unique avatars. Users with positive emotions about themselves tend to create avatars that reflect their actual appearance and consider them as mascots that reflect themselves (Fuschillo et al, 2022). On the other hand, users who want to escape from the monotony of daily life tend to express their avatars in an idealized form, as mascots that represent their hopeful self-image. Avatars are thus utilized as a presence that satisfies both the desire to remain anonymous in cyberspace and the expression of the desire to reveal oneself (Batat, & Hammedi, 2023), and users form a deep attachment to their avatars, considering them as a part of themselves and experiencing a sense of identity with them (Jin et al, 2019).

Hypothesis development

Identification refers to understanding and sympathizing with a situation from another person's perspective (Endacott, & Brooks, 2013). People

experience identification by forming a cognitive and emotional connection with a specific object, creating a sense of identification (Cohen, 2001), and perceiving themselves as participating in the situation faced by the object, thereby becoming fully engaged in the object's situation (Poncin, & Garnier, 2012). Previous research on identification in the media indicates that the factors contributing to users' perception of identification can be divided into similarity identification, wishful identification, and embodied presence (Green et al, 2021; Takano, & Taka, 2022). These factors not only trigger users' enjoyment but also serve as a key factor in empathizing with the object's situation and achieving full immersion (Li et al, 2021).

Regarding the influence of similarity identification on immersion, it is noted that virtual environment users who empathize with objects similar to themselves become more fully immersed in the object's situation. The physical similarity between avatars and users induces homogeneity, enhances self-perception, and promotes immersion (Van Pinxteren et al, 2020). Paleczna et al (2022) examined the user's similarity with the avatar and the user's reaction and found that the more the avatar resembled the user, the more likely the user was to become immersed in the game. When metaverse avatars reflected users' real-life images, users felt more familiarity and increased immersion in the metaverse (Buhalis et al, 2023).

When examining the impact of wishful identification with avatars on immersion, it can be seen that users who strongly identify with attractive avatars enjoy participating in activities as someone else in the virtual world and becoming completely immersed in the virtual world (Yee, 2006). Tawaira & Ivanov (2023) divided the perceived avatar images of users into realistic and idealized images, and as a result of their research, they found that users experience satisfaction and enhanced immersion in virtual spaces not only when the avatar's image is similar to their own, but also when it reflects an idealized image. According to Przybylski et al (2012), who investigated the perceptions of video game users, users become more immersed in video games when they use avatars with idealized appearances.

It was hypothesized that embodied presence, which is the feeling of being present and embodied within a virtual environment, would enhance immersion. According to prior research, individuals tend to feel a sense of ownership over objects that they can control (Flavián et al, 2019) and can become immersed in virtual environments by mistakenly believing that they are in the same situation as the virtual object (Tea et al, 2022). The factors that contribute to immersion in MMORPG game users found that the most influential factor was a sense of

unity with the virtual avatar, which suggests that a sense of unity with the avatar is an important factor in improving users' immersion (Jin et al, 2017). The high level of interaction between avatars and users in metaverse environments is considered a key factor in users feeling embodied presence, and previous studies suggest that immersion can be enhanced through the experience of feeling as if the avatar and the user are one entity (Klimmt, & Hartmann, 2006). Therefore, this study hypothesized that similarity identification, wishful identification, and embodied presence of avatar identification would influence immersion based on empathy and positive reactions.

H1: Similarity identification will have a positive (+) effect on immersion.

H2: Wishful identification will have a positive (+) effect on immersion.

H3: Embodied presence will have a positive (+) effect on immersion.

According to Zhang et al (2021), individuals tend to share positive or negative aspects of their purchasing experiences with friends and acquaintances. With the increasing variety of communication channels such as social media, people are now able to share information more easily than before (De Bruyn, & Lilien, 2008). This behavior of sharing information that has a significant influence on other people's purchasing decisions has been continuously studied in the fields of IT and marketing (Prasad et al, 2019). The objective of this research is to examine how avatar identification impacts the intention to share. Previously, a hypothesis was posited that the identification of avatars would enhance the level of immersion. The present study aims to investigate whether immersion mediates the relationship between avatar identification and intention to share.

Immersion can be described as a dimension of positive affect that occurs when using interactive media (Thompson et al, 2021). By experiencing immersion in online shopping malls, users feel pleasure and have a stronger desire to share it with others, and the user's virtual environment immersion can become a key factor in determining their word-of-mouth behavior (Bao, & Yang, 2022). Online game flow has a significant impact on user loyalty and word-of-mouth behavior (Triantafillidou, & Siomkos, 2014). Dehghani et al (2020) suggest that satisfaction through immersion can have a positive impact on the intention to recommend to others, emphasizing the importance of immersion in mixed reality platforms. Investigating the factors that affect future behavioral intentions in augmented reality and virtual reality, when users feel a sense of reality in a virtual environment, it leads to positive attitudes such as continued use through immersion experience (Shiau, & Huang, 2023). The factors that

influence word-of-mouth intentions in metaverse services verified that the flow perceived by users in metaverse services has a significant impact on word-of-mouth intentions (Habil et al, 2023). Therefore, in this study, it is argued that immersion based on empathy and positive response will affect positive intention to share. This study previously hypothesized that avatar identification would have a positive effect on immersion. Furthermore, the study contends that immersion would positively influence the intent to share. Considering the foregoing discussion, this paper suggests that immersion will serve as a mediator between avatar identification and the intention to share.

H4: Immersion will have a mediating effect on the relationship between similarity identification and the intention to share.

H5: Immersion will have a mediating effect on the relationship between wishful identification and the intention to share.

H6: Immersion will have a mediating effect on the relationship between embodied presence and the intention to share.

Furthermore, the objective of this research is to examine the potential variations in the impact of avatar identification on the intention to share among individuals. To achieve this goal, we focused on immersion as a mediating factor that influences the connection between avatar identification and intention to share. Consequently, this study endeavors to explore the possibility of diverse effects of avatar identification on immersion, contingent on the degree of social distance perceived by individuals, through an exploratory investigation. Baumeister & Learly (1995) proposed that the need to belong, which refers to the necessity for human beings to form and sustain at least a minimum number of interpersonal relationships, is an innate characteristic. This feature can differ among individuals, and much research has been carried out to develop an effective method of measuring interpersonal differences (Lakin, Chartrand, & Arkin, 2008). Differences in the need to establish human connections can be based on traits, such as interdependent self-view, or may arise from one's immediate environment. Social exclusion is an environmental construct that addresses a person's sensitivity to social connections, as it is a situational response stemming from some form of rejection or prohibition from joining a social group of some kind (Lakin et al, 2008; Scorgie, & Forlin, 2019), rather than an individual trait. The desire to immerse oneself in avatars or virtual worlds may be related to experiences of social exclusion. Social exclusion refers to experiences where individuals are excluded or marginalized from interactions with others, which

can lead to a decrease in self-confidence, self-esteem, loneliness, depression, and other negative outcomes. In such situations, virtual worlds offer individuals the ability to manipulate their appearance and surroundings, allowing them to avoid the negative experiences of social interaction. Therefore, the strong desire for virtual worlds or avatars can be understood as an attempt to escape from experiences of social exclusion in the real world.

Socially excluded individuals may exhibit high levels of metaverse experience in virtual worlds. This experience is accentuated when avatars resemble the users themselves. Such experiences suggest a connection with social exclusion experienced in real life, which can lead to anxiety, confusion, and physical and mental distress. Consequently, individuals who have experienced social exclusion can restore their confidence and reduce anxiety in social interactions by using avatars that resemble them. Ultimately, these findings demonstrate that socially excluded individuals can play an active role in the metaverse. Therefore, research and development of the metaverse represent an important factor in promoting self-realization and social integration for socially excluded individuals.

Social exclusion can impose a significant burden on individuals' lives. People who have experienced social exclusion tend to form an idealized self-image in an attempt to compensate for their negative experiences in the real world. This tendency can become even stronger in virtual worlds such as the metaverse, where individuals have the possibility of fully controlling their appearance. Therefore, expressing oneself in the metaverse by portraying an idealized self-image can serve as a means of fulfilling the desire to overcome negative experiences felt in the real world. However, this phenomenon is not limited to the metaverse. People who have experienced social exclusion tend to form idealized images of themselves in the real world as well, and this tendency only influences their behavior in the metaverse. Thus, it is important to emphasize that expressing oneself in virtual worlds such as the metaverse is associated with the development of one's self-image in the real world. Consequently, virtual worlds such as the metaverse can become useful tools for individuals who have experienced social exclusion to develop their self-image.

In recent years, the metaverse has become a popular virtual space worldwide. Experiences in the metaverse are very different from those in reality because activities in the metaverse occur in a virtual form. Anyone can have experiences in the metaverse. However, there is an argument that these experiences can play a more important role for people who have experienced social exclusion. Those who experience social exclusion often find it difficult to reveal their identities

in reality. In such situations, the metaverse provides them with a new way to express themselves and communicate. These experiences make them more actively utilize their avatars in the metaverse. In other words, feeling oneself as an avatar in the metaverse becomes an easier way to reveal oneself than in reality. These experiences increase the sense of immersion in the metaverse, making the time spent in the metaverse longer. Additionally, experiences in the metaverse can be recognized as an alternative to real life, making them even more important. Therefore, when people who have experienced social exclusion feel like avatars in the metaverse, this has greater meaning for them. This makes experiences in the metaverse more enjoyable and leads to greater immersion in their activities. These results will contribute to the increasing popularity of the metaverse and enhance the confidence of people who have experienced social exclusion.

H7: Social exclusion positively moderates the relationship between similarity identification and immersion.

H8: Social exclusion positively moderates the relationship between wishful identification and immersion.

H9: Social exclusion positively moderates the relationship between embodied presence and immersion.

Methodology

Sample

This study sample consists of 228 higher education students with previous experience engaging in metaverse platforms. The sample consists of undergraduate and graduate students in business, social science, and engineering programs in Korea. The criteria for participation in the study include past engagement in the metaverse and a minimum age of 18 years. Though the sample is considered one of convenience, high education students represent a significant subset of a major participant's segment that focuses on active users.

Data collection and instrumentation

The study's objective was to investigate the impact of avatar identification on the intention to share by examining the mediating role of user immersion and the moderating effect of perceived social distance. These factors can be identified by measuring the participants' perceptions of metaverse platforms. The survey research method is very useful in collecting data from many individuals in a relatively short period and at a lower cost. Hence, for the current study, the

questionnaire survey was used for data collection. This study used a professional survey company to conduct the survey. The survey company provided each participant with a paper questionnaire along with an information letter explaining the purpose of the survey, emphasizing voluntary participation, and ensuring confidentiality. Participants were asked to complete the questionnaire and place it back in an envelope for the survey company to collect. The survey period was from May 1 to May 31, 2024, and each participant was allotted 30 minutes to complete the questionnaire. The questionnaire employed psychometric measurement (Nunnally, 1978). Similarity identification was measured using six items from the scale developed by Van Looy et al (2012). For example, "The appearance and behavior of my Zepeto avatar seem to be similar to that of my real-life self". Wishful identification was measured using six items from the scale developed by Van Looy et al (2012). For example, "It would be desirable if I could become like my Zepeto avatar in appearance". Embodied presence was measured using five items from the scale developed by Van Looy et al (2012). For example, "I feel as if I have become my own avatar within the world of Jeju Island". Social exclusion was measured using three items from the scale developed by Mead et al (2011). For example, "I felt excluded". Immersion was measured using five items from the scale developed by Dehghani et al (2020) and Yim et al (2017). For example, "When I decorated my avatar with fashion brand A items within Zepeto, it felt as if I was present in that world". Intention to share was measured using five items from the scale developed by Zhang et al (2021). For example, "I am planning to share my Zepeto avatar, which is adorned with fashion brand items, on social media".

The control variables included Gender, Age, and Educational Level. Gender was coded as a dummy variable, with male respondents coded as 1 and female respondents as 0. Age was recorded as a continuous variable, representing the respondent's age at the time of the survey. Educational Level was also coded as a dummy variable, where respondents with a college-level education or lower were coded as 0, and those with a master's degree or higher were coded as 1.

Verification of reliability and validity

The validity of variables was verified through the principal component method and factor analysis with the varimax method. The criteria for determining the number of factors is defined as a 1.0 eigenvalue. This study applied factors for analysis only if the factor loading was greater than 0.5 (factor loading represents the correlation scale between a factor and other variables). The reliability of variables was judged by internal consistency as assessed by

Cronbach's alpha. This study used surveys and regarded each as one measure only if their Cronbach's alpha values were 0.7 or higher.

Common method bias

As with all self-reported data, there is the potential for the occurrence of common method variance (CMV) (MacKenzie, & Podsakoff, 2012; Podsakoff et al, 2003). To alleviate and assess the magnitude of common method bias, this study adopted several procedural and statistical remedies that Podsakoff et al (2003) suggest. First, during the survey, respondents were guaranteed anonymity and confidentiality to reduce the evaluation apprehension. Further, we paid careful attention to the items' wording and carefully developed our questionnaire to reduce the item ambiguity. These procedures would make them less likely to edit their responses to be more socially desirable, acquiescent, and consistent with how they think the researcher wants them to respond when answering the questionnaire (Podsakoff et al, 2003; Tourangeau, Rips, & Rasinski, 2000). Second, this study conducted a Harman's one-factor test on all of the items. A principal component factor analysis revealed that the first factor only explained 34.9 percent of the variance. Thus, no single factor emerged, nor did one-factor account for most of the variance.

Furthermore, the measurement model was reassessed with the addition of a latent common method variance factor (Podsakoff et al, 2003). All indicator variables in the measurement model were loaded on this factor. The common variance factor's addition did not improve the fit over the measurement model without that factor with all indicators still remaining significant. These results do suggest that common method variance is not of great concern in this study.

Results

Relationship between variables

Table 1 summarizes the Pearson correlation test results between variables and reports the degree of multi-collinearity between independent variables. The minimum tolerance of 0.823 and the maximum variance inflation factor of 1.215 show that the data analysis's statistical significance was not compromised by multi-collinearity.

Table 1

Variables' correlation coefficient

Variables	1	2	3	4	5
Similarity identification	1	-	-	-	-
Wishful identification	-.051	1	-	-	-
Embodied presence	.071	.039	1	-	-
Social exclusion	.072	.044	.018	1	-
Immersion	.017**	.025**	.015**	.041*	1
Intention to share	.014*	.042*	.027**	.041**	.023**

* $p < .05$, ** $p < .01$

According to Table 1, similarity identification, wishful identification, embodied presence, and social exclusion all have a positive relationship with immersion. The results of this correlation analysis show that the independent and control variables will have a positive effect on the mediating variable. And, similarity identification, wishful identification, embodied presence, social exclusion, and immersion all have a positive relationship with Intention to share. Additionally, it shows that independent variables, control variables, and mediator variables will all have a positive effect on the dependent variable.

Hypothesis testing

This research utilized hierarchical multiple regression analyses with three stages to examine the hypotheses. First, the effect of avatar identification on immersion was analyzed. As shown in Table 2, as a result of first introducing demographic variables, it was found that gender is negatively related to immersion ($\beta = -.055$, $p < .01$). In this study, gender was coded as 1 for men, so the analysis results show that women are more likely to fall into immersion than men. Second, as a result of inputting three variables of avatar identification, it was found that all three variables of similarity identification ($\beta = .082$, $p < .01$), wishful identification ($\beta = .055$, $p < .01$), and embodied presence ($\beta = .039$, $p < .01$) had a positive effect on immersion. Hypotheses 1, 2, and 3 were supported.

Table 2

Analysis of the effect of independent variables on parameters

Variables	Immersion	
	Model 1	Model 2
Gender	-.055*	-.043*
Age	-.023	-.016
Educational level	.043	.031
Similarity identification	-	.082**
Wishful identification	-	.055**
Embodied presence	-	.039**
Adj. R^2	.103	.148
F	4.653**	8.991**

* $p < .05$, ** $p < .01$

Second, to ensure that immersion mediates the relationship between each of the variables of avatar identification, Baron & Kenny's (1986) steps for establishing mediation were followed. First, all three variables of avatar identification should be correlated to share. As a result of the analysis, similarity identification ($\beta = .061$, $p < .01$), wishful identification ($\beta = .044$, $p < .01$), and embodied presence ($\beta = .053$, $p < .01$) have a positive effect on the intention to share. Second, it was determined that all three variables of avatar identification are related to immersion. This relationship is shown by the analysis results for the verification of hypotheses 1, 2, and 3 above. Third, when similarity identification, wishful identification, and embodied presence were then entered into the model, immersion was found to be positively related to the intention to share and some paths were statistically insignificant or other path coefficients decreased. As a result of the analysis, immersion ($\beta = .012$, $p < .01$) was found to have a positive effect on intention to share. Among the variables of avatar identification, the effect coefficient and significance level of embodied presence decreased after immersion was introduced ($\beta = .028$, $p < .05$). Thus, as shown in Table 3, there is sufficient empirical support to conclude that immersion mediates the relationship between avatar identification variables and intention to share. On the other hand, immersion did not mediate the relationship between other variables of avatar identification and intention to share. Therefore, only H6 was supported.

Table 3

**Analysis of the effect of mediating variables in the influence relationship
 between independent variables and dependent variables**

Variables	Intention to share		
	Model 1	Model 2	Model 3
Gender	-.077*	-.055*	-.039*
Age	-.062	-.058	-.043
Educational level	.074	.051	.043
Similarity identification	-	.061**	.032
Wishful identification	-	.044**	.028
Embodied presence	-	.053**	.028*
Immersion	-	-	.012*
Adj. R ²	.098	.121	.151
F	4.101**	7.441**	9.825**

Lastly, model 3 of Table 4, consisting of moderators, shows the interactions between avatar identification variables and social exclusion on immersion. Social exclusion positively affected the relationship between embodied presence and immersion ($\beta = .031, p < .01$). Social exclusion was found to have no significance in the relationship between other variables of avatar identification and intention to share (see Figure 1). Therefore, only H9 was supported. Table 5 shows the summary of results.

Figure 1

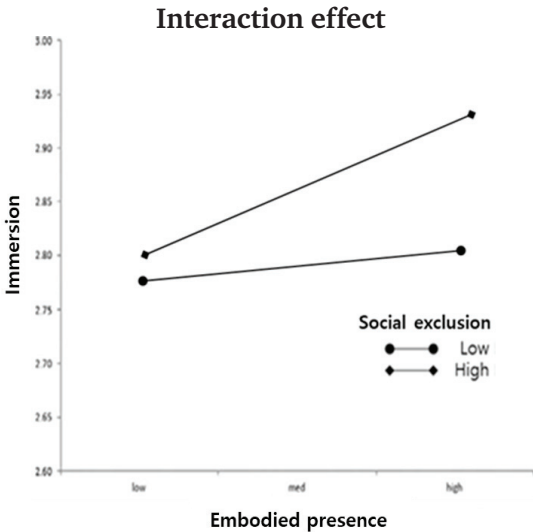


Table 4

Analysis of the effect of moderators on the influence relationship between independent variables on mediators

Variables	Immersion		
	Model 1	Model 2	Model 3
Gender	-.055*	-.043*	-.027*
Age	-.023	-.016	-.003
Educational level	.043	.031	.020
Similarity identification	-	.082**	.065**
Wishful identification	-	.055**	.041**
Embodied presence	-	.039**	.021**
Social exclusion	-	-	.019**
Similarity identification* Social exclusion	-	-	.021
Wishful identification* Social exclusion	-	-	.010
Embodied presence* Social exclusion	-	-	.031*
Adj. R^2	.103	.148	.192
F	4.653**	8.991**	12.545**

* $p < .05$, ** $p < .01$

Table 5

Results

Hypotheses	Results
H1: Similarity identification will have a positive (+) effect on immersion.	Supported
H2: Wishful identification will have a positive (+) effect on immersion.	Supported
H3: Embodied presence will have a positive (+) effect on immersion.	Supported
H4: Immersion will have a mediating effect on the relationship between similarity identification and the intention to share.	-
H5: Immersion will have a mediating effect on the relationship between wishful identification and the intention to share.	-
H6: Immersion will have a mediating effect on the relationship between embodied presence and the intention to share.	Supported
H7: Social exclusion positively moderates the relationship between similarity identification and immersion.	-
H8: Social exclusion positively moderates the relationship between wishful identification and immersion.	-
H9: Social exclusion positively moderates the relationship between embodied presence and immersion.	Supported

Discussion and conclusion

The purpose of this study was to investigate the effect of avatar identification on the intention to share. To identify this relationship of influence, this study analyzed whether immersion mediated the relationship between avatar identification and intention to share and whether social exclusion regulated the relationship between avatar identification and immersion. As a result of the analysis, first, when metaverse avatars reflected users' real-life images, users felt more familiarity and increased immersion in the metaverse (Buhalis et al, 2023). The results show that similarity identification, wishful identification, and embodied presence, which represent avatar identification, all had a positive relationship with immersion. That is, as expected, the more the user is similar to the avatar, wants to resemble the avatar, or has a greater sense of reality through the avatar, the more immersed the user is in the avatar.

Second, according to Przybylski et al (2012), who investigated the perceptions of video game users, users become more immersed in video games when they use avatars with idealized appearances. The results show that among sub-variables representing avatar identification, only embodied presence increased the intention to share through immersion. On the other hand, the other two sub-variables had no mediating effect of immersion for the intention to share. "Embodied presence" means that the user has direct control over their avatar, and their movements and actions are transmitted to the avatar. This makes the user's avatar feel more real, thus helping the user feel a real presence in the virtual world. This promotes "immersion", which makes the user more immersed in the virtual world. Thus, "embodied presence" can help increase users' intention to share their avatars. On the other hand, "similarity identification" and "wishful identification" mean that the user feels similar to their avatar, or that the avatar represents the state they would like to be. These variables can strengthen the emotional connection between users and their avatars but do not directly influence users to increase their intention to share in the virtual world. The reason for this is that "similarity identification" and "wishful identification" are related to the user's personal needs and self-identification. This may not be appropriate material to share with other users. On the other hand, an "embodied presence" is better for interacting more directly with other users, so it can be material that can be easily shared with other users.

Lastly, the high level of interaction between avatars and users in metaverse environments is considered a key factor in users feeling embodied presence, and previous studies suggest that immersion can be enhanced through the experience of feeling as if the avatar and the user are one entity

(Klimmt, & Hartmann, 2006). The results show that social exclusion positively modulates the influence relationship between embodied presence and immersion among variables representing avatar identification. In other words, the more socially excluded people are, the more immersed they are in the realism of the avatar. Because people with high levels of “social exclusion” often feel unconnected to others, it becomes more important to feel more connected to others through their characters in the virtual world. On the other hand, “similarity identification” and “wishful identification” are elements that allow you to be more immersed in the virtual world through a character that is similar to you or wants to be you. Thus, these factors do not change their impact on immersion in virtual worlds regardless of social exclusion. These results show that the various factors that increase immersion in virtual worlds can act in different ways.

For research contribution, this study is the first to examine the integral model of avatar identification factors in the metaverse platform. Despite growing practical importance, few quantitative studies on avatar identification factors affect participants’ intentions to share. Given this situation, this study focused on participants’ immersion in the relationship between avatar identification and intention to share. This study shows that people who feel an embodied presence with an avatar want to share their avatars through their immersion.

Second, this study is the first to investigate the moderating effect of perceived social distance in the metaverse. The results show that since people who experience more social exclusion feel a more embodied presence through their avatar in the metaverse platform than any others, they are more immersed in their avatar. Therefore, this study extends the metaverse study’s scope by suggesting the study of the moderating effect on the relationship between avatar identification factors and immersion.

For practical implications, first, this study’s results show the mechanism by which avatar identification enhances the intention to share. Therefore, metaverse platform managers need to make the metaverse participants perceive that they can feel similarity identification, wishful identification, and embodied presence. For example, it would be good to build a reputation by giving points to active participants in the metaverse platform, such as evaluation.

Second, this study’s results show that the participants’ perceived social distance enhances the impact of embodied presence on immersion. Therefore, metaverse platform managers need to be aware of their propensity through evaluation records of participants. For example, participants who exhibit high activities when evaluating avatars perceive high social exclusion, so it is

necessary to provide them with a way to provide embodied presence rather than other avatar identification factors.

By this research results, the present study could have several insights into participants' avatar identification in the metaverse. However, it should also acknowledge the following limitations of this research. First, the present study collected responses from university students in South Korea. There may exist some national cultural issues in the research context. Future studies should re-test this in other countries to assure these results' reliability. Second, as the variables were all measured simultaneously, it cannot be sure that their relationships are constant. Although the survey questions occurred in reverse order of the analysis model to prevent additional issues, the existence of causal relationships between variables is possible. Therefore, future studies need to consider longitudinal studies. Finally, this study uses perceived similarity identification, wishful identification, and embodied presence as avatar identification factors and explores immersion as a mediator and social distance as a moderator. However, considering the characteristics of the metaverse, future studies may find other factors. For example, the metaverse platform's sustainability as an intrinsic motivation factor, or economic benefits as extrinsic motivation factors may be considered. The social identity, such as the interdependent self-view felt by the platform participants, can be considered a moderating factor.

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