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A Study on Avatar Self-Expression in VR Environment☆

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ABSTRACT

The virtual world is evolving, and it is becoming increasingly vital to understand how human interaction in the virtual world affects social efficacy and body perception in the actual world. In particular, the Proteus effect has demonstrated that the attributes of the avatar chosen by the user while immersed in the virtual world can influence human behavior. Based on this, the study investigates how self-awareness differs depending on the sort of avatar's self-expression in a Virtual Reality (VR) environment. Experiments with the VR social app and pre-test and post-test questionnaires were carried out to validate study topics. Consequently, most respondents decorate avatars that resembled their appearance in an actual media environment. Deviant self-expression is the lowest in terms of avatar expressiveness. Furthermore, social activities mediate by avatars alter body perception and social efficacy, and weight self-consciousness improved following the VR encounter. Passive expression of opinion is observed during social activities. Finally, a favorable relationship exists between the avatar's ideal self-expression and self-esteem. Ideal self-expression is specifically linked to a sense of superiority and achievement.

☞ keyword : Virtual Reality, VR social platform, Horizon World, Avatar, self-expression, Mixed reality, Metaverse

1. Introduction

People today live in a world inundated with communication media. When the world's first VR game console, "Virtuality", was released in the United Kingdom in 1991, the development and implementation of VR technology began to gain attention. With the arrival of the fourth industrial revolution, numerous new ICT technologies have emerged, and the new media business based on virtual reality is rapidly developing and expanding. Referring to a recent market research study by MarketsandMarkets™, the market utilizing VR is forecast to increase rapidly and rise from $6.1 billion in 2020 to $20.9 billion in 2025, growing at a compound annual growth rate of 27.9%. [1]

New forms of interactions are being had through virtual personae as more and more virtual reality apps and games become available. People in the modern era who traverse the virtual and the real over the Internet can freely develop and distribute whatever they want to whomever they want in the virtual world. Yee and Bailenson are credited with inventing the idea of the Proteus Effect. [2] A phenomenon in which a person's actions take on the traits of their virtual character or avatar. In other words, using an avatar affects how you connect with others online. In light of this, this research was built around people's avatars and their methods of expressing themselves in a simulated setting.

People today worry excessively about their physical appearance and weight because of shifting and improved aesthetic standards, a successful plastic surgery and beauty industry, the coinage of the term "appearance supremacy," and a general increase in the frequency with which they compare themselves to celebrities. Pursuing an excessively refined look or failing to pay attention to one's appearance is a societal problem that can lead to a decline in self-esteem and, ultimately, mental and physical health. Scholars at home and abroad have investigated the connection between avatar use, self-image management practices, and self-esteem. While research on avatars and self-expression has progressed, it still primarily concentrates on users' demographic and social psychological details and the avatar's appearance.

Corn VR, released in 2018 by SK Telecom and SK Broadband, is Korea's first social virtual reality platform; moreover, it has yet to be well received by the general public.

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Social VR platforms' contents and services still need to totally satisfy users' expectations, in contrast to the local market condition, where the popularity of social network services and responsiveness to IT culture is high. [3] In light of this circumstance, this research aimed to identify the association between different types of self-expression, levels of self-esteem, and self-identification to improve the level of pleasure experienced by users of social VR platform services. In order to accomplish this goal, the research presented here breaks the analysis down into three stages: (1) to categorize and investigate the self-types revealed in people's self-expression in the VR virtual world; (2) to investigate the effects of different self-types on self-esteem; and (3) to investigate the differences in the effect of self-synchronization depending on the type of self. In conclusion, the research results presented above enable the study to reveal the proposed improvements and development proposals for advancing virtual reality (VR) technology. These proposals aim to alleviate anxiety regarding the appearance of modern people, improve self-esteem, ultimately attract more users and expand the market for VR. Concurrently, it is meant to provide helpful references and implications for virtual reality (VR) research, which is still in its formative years from an academic standpoint.

2. Theoretical background

2.1 Proteus Effect

The Greek mythological figure Proteus is the inspiration for the adjective adaptable, which means "variable", "changeable", or "capable of taking various forms". The "old man of the sea", as he is known in Greek mythology, is a legendary seafarer. Because he shares the fluid, ever-evolving qualities of the sea and water, Proteus is said to be able to adapt his appearance to fit his surroundings. An idea known as the "Proteus Effect" refers to a phenomenon in which an individual's conduct in a virtual world alters according to the features of an avatar. In other words, avatars alter their interactions with other people in a virtual reality environment. [2]

Theoretically, the Proteus effect is founded on behavioral confirmation, self-perception theory, and deindividuation. Behavioral confirmation refers to the impact a perceiver's actions can have on an individual's subsequent conduct. The Proteus effect varies from behavioral confirmation because it refuses to consider a perceiver's actions. Instead, it seeks to explain how, independent of social encounters, an individual's stereotypes, and expectations drive behavior change. [5] According to self-perception theory, people establish their attitudes and feelings by watching their conduct and the circumstances that lead to such behaviors. The Proteus effect extends this concept into virtual worlds, where people envision themselves as avatars, influencing their behavior. [6] Deindividuation is the loss of self-awareness and self-evaluation due to belonging to a community. Deindividuation amplifies the impact of identification cues on individuals. The level of anonymity most likely causes deindividuation in virtual settings that this type of setting affords its users. [7] In immersion in a virtual environment, the Proteus effect is a sequence of the impact that occurs when the user assumes that the avatar that the user installs conform to the expectations or stereotypes of others.

According to previous research findings, customizing an avatar to represent oneself in a virtual reality environment, or choosing an avatar to represent oneself, can alter one's behavior in the virtual world. Nevertheless, it appears to alter one's perception of themselves. [8] Thus, this study will explore the change in self-awareness caused by the different forms of avatar expressions, emphasizing the Proteus effect that occurs when participants are in a virtual reality setting.

2.2 Avatar and Self-expression

Through self-expression, humans pay attention to how they are reflected in others and confirm their presence and identity. [9] Since this interest motivates human behavior, self-expression is an essential task for an individual and a necessary element for social interaction. [10] The need for self-expression can be seen as an element of impression management, where one pays attention to how one's self appears to others and simultaneously make an effort to create one's preferred appearance. An avatar in virtual space does not have a biological body as in reality. Still, it can be viewed as an organism with an ego and has the ability to change the avatar image according to one's wishes, so it is an object of

surrogate satisfaction for things that cannot be realized in reality. These scholars have confirmed that the types of avatars in the virtual Internet space, such as the actual space, appear in the form of exaggerated expressions of shapes and features close to reality. [11,12]

In this context, the user does not regard the avatar as simply an artificial entity but perceives it as a living unit and interacts with the avatar itself. [13] In particular, one studied self-expression desire and identification with avatars in virtual space. [14] The image of the avatar implemented online is divided into the actual image of the user, the ideal image of the user, and the deviant image. People use a lot of items and money to decorate their avatars to realize the ideal image, and the group that illustrates the real image greatly respects their bodies. The group with the ideal image has high self-esteem. Accordingly, this study regards the avatar in the virtual space as an object for which the user's self is projected and intends to examine the differences in body type, self-esteem, and self-identification level according to the type of avatar expression in the VR environment.

2.3 Avatar expression types and Self-esteem

The avatar in the virtual space is the realization of the individual's real self and is also an essential medium through which the individual participates in the virtual world. Avatar allowed people to transform their identities freely, and an atmosphere has been created in which this phenomenon is generally accepted. [11] The advent of the "avatar customization" feature allows people to choose avatars. They can start by selecting characteristics (gender, skin color) according to their personal preferences, enabling users to create avatars that can genuinely represent themselves.

An individual's self-expression in the Internet environment is a fusion of the real and ideal selves. [15] The avatar used by the user expresses the ideal self-image. [16] Regarding the difference between the avatar and the authentic self, the individual's evaluation of the avatar is significantly higher than that of the authentic self, mainly reflected in the difference in the body. [17] Individuals infer and evaluate their characteristics by referring to the avatar's appearance in virtual space. [2] It is said that an individual's evaluation of the avatar affects their evaluation.

Self-esteem relates to a positive or negative evaluation of one's self. It refers to the degree of respect for oneself and the degree to which one considers oneself worthwhile. Dissatisfaction with weight or appearance lowers one self-esteem. In addition, low self-esteem was found to affect mental health, such as difficulties in interpersonal relationships, stress, and anxiety. Self-esteem mentioned above was related to appearance satisfaction, obesity stress, and weight control behavior. [18] It can be seen that the image possessed by the avatar affects an individual's image recognition and further affects self-awareness and self-esteem. The avatar expression types of the avatar are related to an individual's self-esteem.

2.4 Degree of avatar identification with avatar expression types

Identification is the process of reaching a cognitive and emotional state in which the recipient does not perceive themselves as a member of the recipient but instead imagines them as one of the characters in the text. [19] Identification also means consumers feel a psychological linkage or emotional attachment to a specific object. [12]

In a VR environment, users temporarily think of themselves as an avatar by fusion with the avatar in a social platform. [20] In cyberspace, they attach themselves to the 'another me,' the avatar, and feel a strong identification. [21] Avatar identification is to be determined by three dimensions: (1) Wishful Identification: the degree to which the player desires to be more like their avatar; (2) Similarity Identification: the degree to which the player sees their avatar as similar to themselves; (3) Embodied Presence: the degree to which the player feels as if they are their avatar when playing. [22] Notably, the ideal and the actual avatar affect the degree of identification. When the avatar is attractive, the player has a high degree of ideal identification with the avatar. [23] When the avatar's body is similar to that of the gamer, the identification with the avatar increases. [24] Specifically, when people create an avatar, they know how much the avatar resembles their real self and how much the avatar resembles their ideal self. According to this, it affects avatar identification. Therefore, it can be predicted that the degree of avatar identification varies according to the avatar expression types.

The present study verifies the effect of avatars' expression types on individual social efficacy in a realistic media environment by asking three research questions.

[Research Question 1] How do avatar self-expression types appear in a VR environment?
[Research Question 2] How do social efficacy, self-esteem, and body perception change after avatars mediate social activities in a VR environment?
[Research Question 3] According to avatar expression types, are social efficacy, self-esteem, and body perception differences?

3. Method

3.1 Procedure

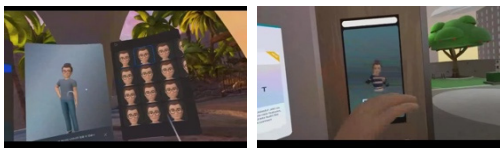
The experiment occurred between October 4, 2022, and November 21, 2022. To experience the VR content, we used an Oculus Quest 2 and VR controllers, and we made sure that the activity area was large enough for the subjects to focus on the experiment. The scientist used the Oculus app's mirroring feature to check how well the subjects were executing the activities, timed them, and provided step-by-step directions. Because most volunteers needed to gain experience with VR content or HMDs, they were educated on utilizing the HMD, controller, and tasks in each trial step. They then took a pre-survey on self-esteem, social efficacy, and body image. They then donned the HMD and completed a three-stage assignment in the Horizon World application. Following the VR experience, a post-survey was administered, which included questions about avatar representation type (actual, ideal, deviant), degree of identification, social efficacy, self-love, and body esteem.

3.2 Treatment

The first task assigned on the VR social site is to "customize your avatar." Participants got five minutes to modify the appearance of their avatars. Users in Horizon World can modify their avatar's physical traits and jewelry. Body shape, hair, brows, eyes, eyelashes, nose, complexion, and mouth are examples of physical characteristics. Clothes, jewelry, eyewear, and other items are available under Accessories.

The second stage is to practice your avatar's movements in front of the mirror. After personalizing your avatar, you have two minutes to practice its looks, movements, and VR controller controls by looking at it in the mirror. I learned how to move my arms and head and use emoticons. (thumbs up, hurray).

The final objective required connecting to the outside world and interacting with users. Participants received five minutes to communicate freely with other users in the realm of Hang Out. They were given more time to practice if the time was delayed owing to unfamiliarity with the controls.



(a) (b)

(c)

(Figure 1) a: Customize your avatar; b: Familiarizing yourself with avatar movement; c: Accessing the world and interacting with users

3.3 Definition of significant variables

To ascertain the degree of change in body esteem, we asked participants in the pre-test and post-surveys about their perceptions of their appearance, weight, and body function. After that, we conducted avatar expression type and self-love in the post-survey. The following are the operational definitions of the primary variables.

3.3.1 Body esteem

Body esteem is a component of self-esteem, the evaluation or feeling of numerous aspects of oneself. [25] Body esteem is the degree of satisfaction with one's body as it relates to

appearances, such as the shape and appearance of an individual's body as seen by others. It is frequently a subjective evaluation based on comparison with others and oneself. [26] The components of body esteem are often conceptualized and measured in terms of weight and appearance. Still, it is also used to examine diverse areas of human behavior, such as regard for internal organs and physiological functions. [25] According to it, the body esteem scale consists of 6 items about appearance, three items about weight (m=3.41, Cronbach's α=0.752), and nine items pertaining to body function (m=3.46, Cronbach's α=0.919).

3.3.2 Type of Avatar Expression

Based on the previous research, [14] we classified types of avatar self-expression into three types: realistic, idealized, and deviant. Real images are those in which the user attempts to decorate their avatar with a representation of themselves in reality. [12] It consists of three items (m=2.59, Cronbach's α=0.932): "I attempt to decorate my avatar to reflect my real self to some extent," "I believe my avatar is similar to my real self," and "I attempt to express my avatar as my real self."

The representation of the idealized self is the fulfillment of one's or others' desires. [12] We calculated the mean of the three statements: "When I decorate my avatar, I decorate myself in a manner that is not reflective of my true self." "When I decorate my avatar, I try to reflect my ideal self as much as possible," and "I decorate my avatar with objects I admire," on a 5-point scale (m=2.85, r=0.367).

Deviant images are images that are either physically impossible (animals, opposite sex) or violate social norms (villains, etc.). [14] It consisted of two items: 'My avatar has an unusual and fascinating appearance' and 'My avatar attracts the attention of others' (m=2.89, r=0.632).

3.3.3 Narcissistic tendencies

Narcissism is "the tendency to love and esteem oneself absolutely". [27] Therefore, positive self-concepts, such as self-esteem, will be measured through narcissism. To measure narcissistic disposition, we used Narcissistic Disposition Scale. [28] The Narcissistic Disposition Scale consists of a four-factor measure of self-reliance, sense of superiority, sense of accomplishment, and self-immersion with 13 items asked (m=3.08, r=0.847).

4. Findings and Discussion

4.1 Type of self-expression using Avatar

The actual self-expression has the lowest level (m=2.59, sd=1.252). Ideal self-expression averaged 2.84 (sd=1.088), and deviant self-expression averaged 2.88 (sd=1.089).

As a result of conducting an independent sample t-test to determine the type of avatar expression according to gender, no significant effects were found. Women (m=2.70) tended to make avatars by comparing them to their actual selves compared to men (m=2.37). Still, they were not statistically significant, and ideal avatars were similar to women (m=2.91) and men (m=2.75) and men (m=2.18), but they were not statistically more deviant than women (m=3.18).

There was no difference in the degree of actual and ideal avatar expression according to actual and online self-exposure intention. There was no difference in the actual or ideal avatar expression according to the degree. The group with a strong desire for self-exposure online has a higher degree of deviant avatar expression than the group with a low willingness to self-exposure. However, it is not a statistically significant level (t=-1.302, p=0.198).

4.2 Changes in social efficacy, self-esteem, and body perception after experiencing social activities in the VR environment

Participants in the experiment had poor social efficacy after using VR social applications. In particular, there is a significant decrease in terms of opinion expression (a-b=-0.508, t=-3.848***) and help request (a=b=-0.347, t=-2.945**). The reason for this change is probably the language barrier in interacting with other people, as Horizon World currently provides services mainly in English in North America and Europe. However, the participants in this study did not use English as a native language.

(Table 1) Changes in social efficacy

		mean	*s.d*	*a-b*	*t*
formation of relationship	before	3.32	0.95	-0.186	-1.433
	after	3.14	1.07		
expression of opinion	before	3.52	0.89	-0.508	-3.848***
	after	3.01	1.08		
call for help	before	3.58	0.87	-0.347	-2.945**
	after	3.24	0.88		

p<0.05 p<0.01**, a-b: after-before*

As a result of conducting a response sample t-test to confirm the Proteus effect regarding self-love, there was no significant change in the sub-factors of self-esteem before and after the VR experience, such as self-reliance, sense of accomplishment, and self-immersion. However, the sense of superiority has increased significantly (a-b=0.161, t=2.445*). Thus, experiencing VR gave consumers more sense of superiority, perhaps because they were exposed to new technology.

(Table 2) Changes in self-esteem

		mean	*s.d*	*a-b*	*t*
self-reliance	before	3.02	0.81	0.054	0.816
	after	3.07	0.85		
sense of superiority	before	2.86	0.59	0.161	2.445*
	after	3.03	0.69		
sense of accomplishment	before	4.14	0.72	-0.136	-1.988
	after	4.00	0.73		
self-immersion	before	3.87	0.80	-0.059	-0.866
	after	3.81	0.81		

*p<0.05, **p<0.01 ***p<0.001, ※ a–b: after – before*

Before and after experiencing VR social content, respect for weight increased (a-b=0.124, t=2.252**). Interestingly, when you make avatars in Horizon World, you can decorate your lower body and accessories, but you can not see your upper body in the mirror and the world. The presence or absence of the lower body does not affect weight perception. However, intentional appearance or floating can reduce weight involvement.

(Table 3) Changes in body perception

		mean	*s.d*	*a-b*	*t*
appearance	before	3.08	0.64	0.076	1.524
	after	3.16	0.65		
weight	before	3.41	0.98	0.124	2.252**
	after	3.54	0.86		
body function	before	3.45	0.86	0.037	0.593
	after	3.48	0.78		

*p<0.05, **p<0.01 ***p<0.001, ※ a–b: after – before*

4.3 Change in Social efficacy, Self-esteem, and Body perception by Avatar expression

In terms of physical respect, the proteus effect seems to appear in men (a-b=0.299) rather than women (a-b=0.007) (t=-2.071, p=). In particular, in terms of body function, women's physical respect decreased, and men increased (t=-1.153*)

(Table 4) Changes in social efficacy, self-esteem, and body perception by gender

	gender	*a-b*	*s.d*	*t*
social efficacy	women	-0.241	0.737	0.512
	men	-0.342	0.652	
self-esteem	women	0.000	0.333	-0.922
	men	0.076	0.182	
body perception	women	0.007	0.299	-2.071*
	men	0.196	0.382	

*p<0.05, **p<0.01 ***p<0.001, ※ a–b: after – before*

An independent sample t-test was conducted to determine the difference in self-awareness according to the avatar expression type on the VR social platform. Ideal deviant self-expression did not change social efficacy, self-love, and physical respect. On the other hand, there is a statistically significant difference in the amount of change in narcissism according to the actual degree of self-expression. Groups with high actual self-expression decreased self-love, while groups with low actual self-expression increased their self-love (t=2.228, p=0.032).

(Table 5) Changes in social efficacy, self-esteem, and body perception by actual self-expression

	actual self-expression	*a-b*	*s.d*	*t*
social efficacy	low	-0.14	0.708	1.542
	high	-0.43	0.687	
self-esteem	low	0.10	0.231	2.288*
	high	-0.07	0.336	
body perception	low	0.11	0.364	1.166
	high	0.01	0.299	

*p<0.05, **p<0.01 ***p<0.001, ※ a–b: after– before*

5. Conclusion

This study intended to explore how avatars are represented on VR social platforms and how experiencing an immersive virtual environment through an avatar can alter a user's self-perception. To accomplish this, we used a structured environment to customize an avatar on Horizon World, a VR social network, and connect with others via the avatar. Here is what we discovered.

First, we investigated how users portrayed their avatars in a VR environment and discovered that participants often modify their avatars to be distinctive, antisocial, or something they desire to be. They were less inclined to customize their avatars to reflect their real-life selves than idealized or deviant self-representations. Despite the significant diversity and richness available for their faces and upper bodies, avatars in Horizon World are more likely to depict themselves as aspirational or antisocial than as normative selves. Metaverses are projected to perform numerous social activities within virtual space, including social, gaming, and cultural purposes, as well as economic, administrative, financial, political, and distributional functions. The avatar is a real self that can lead to acceptable behavior when taking over the functions of the actual space. Because VR platforms have not yet progressed beyond entertainment, idealized and deviant self-representations of avatars appear to predominate, as in earlier studies.

Second, we sought to see if there was a change in social efficacy, self-love, and body esteem after social contact through avatars, based on the Proteus effect, which theorizes that projecting an avatar modifies how an individual behaves or interacts. The findings revealed that social efficacy was reduced both before and after experiencing VR social platforms. The decline in social effectiveness might be attributed to the fact that most users were new to VR content or VR social content, and there were communication challenges because most users were English-speaking. Furthermore, perceptions of appearance and physical function among those with high body image tend to rise, but this is not statistically significant. Only the sense of weight improved. When you create an avatar in Horizon World, you can choose a lower half or shoes; however, when you look in the mirror on MySpace or access the world, your lower half disappears, and you see your top half strolling around. This occurrence reduced their cognitive involvement with their weight. We also investigated whether gender and self-presentation type affected self-perception changes. We discovered that men had higher body esteem before and after encountering VR social content than women. In addition, users who engaged in realistic self-presentation had lower self-confidence than those who did not.

From Facebook to Zeppetto, researchers have examined many aspects of online community building. Compared to other research, this study considers not only the many forms of self-expression already mentioned but also more nuanced factors like gender and the motivation for self-disclosure. VR social networks, on the other hand, differ significantly from the two-dimensional, non-immersive virtual worlds that have been addressed thus far. Future research should consider VR-specific characteristics such as immersion, cyber sickness, and HMD operation expertise to account for these variations.

References

[1] "Virtual Reality Market Size, Industry Report Growth Drivers", MarketsandMarkets, pp.56-61, 2020. https://www.marketsandmarkets.com/Market-Reports/reality-applications-market-458.html

[2] N. Yee & J. Bailenson, "The Proteus effect: The effect of transformed self-representation on behavior", Human communication research Vol. 33, No. 3, pp. 271-290, 2007. https://doi.org/10.1111/j.1468-2958.2007.00299.x

[3] J. S. Kang & T. Y. Kang, "Social VR Platform Usability Analysis -Focused on avatar, environment, interaction & communication-", Journal of Communication Design, Vol. 69, pp. 419-428, 2019. https://doi.org/10.25111/jcd.2019.69.32

[4] Yun Gery, "A Study on Characteristics of Digital Human Eye Implementation for Improvement of Immersion in VR Environment", Journal of Korea Institute of Spatial Design, Vol. 15, No. 8, pp. 325-336, 2020. https://doi.org/10.35216/KISD.2020.15.8.325

[5] N. Yee, J. Bailenson & N. Ducheneaut, "The Proteus Effect: Implications of Transformed Digital Self-Representation on Online and Offline Behavior",

Communication Research, Vol. 36, No. 2, pp. 285 – 312, 2009.
https://doi.org/10.1177/0093650208330254

[6] D. J. Bem, “Self-perception theory. In Advances in experimental social psychology”, Academic Press, Vol. 6, pp. 1-62, 1972.
https://doi.org/10.1016/s0065-2601(08)60024-6

[7] Ratan, A, Rabindra & M. Dawson, “When Mii is me: A psychophysiological examination of avatar self-relevance”, Communication Research, Vol. 43. No. 8, pp. 1065-1093, 2016.
https://doi.org/10.1177/0093650215570652

[8] S. Y. Ahn, J. Kim, “The Influence of Self Camera(Selfie) on Self-disclosure, Body-esteem, Appearance Management, Social Self-efficacy of Women in their 20s: Focused on Proteus Effect”, Journal of Cybercommunication Academic Society, Vol. 33, No.2, pp.87-123, 2016.
https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE06696806

[9] J. Han & K. Nah, “A Study of Self-Image Languages as a Self-Expression Tool”, Journal of Korea Society of Color Studies, Vol. 30, No. 1, pp. 37-46, 2016.
https://doi.org/10.17289/jkscs.30.1.201602.37

[10] Goffman, E., “The moral career of the mental patient”, Psychiatry, Vol. 22 No. 2, pp. 123-142, 1959.
https://doi.org/10.1080/00332747.1959.11023166

[11] H. Jeong & G. Um, “The study on avatar types case in the virtual space: Centering on the domestic avatar types.”, Journal of The Korean Society Design Culture, Vol. 7, No. 1, pp. 319-331, 2001.
https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE06541303

[12] K. Ahn, C. Yoo & S. Kim, “The Study on the Structural Model of Avatar Decoration Needs, Avatar Self-Identification and Site Attitude & Loyalty”, Journal of Consumer Studies, Vol. 15, No. 2 pp. 19-38, 2004.
https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE10976982

[13] J. F., Bélisle & H. O. Bodur, “Avatars as information: Perception of consumers based on their avatars in virtual worlds”, Psychology & Marketing, Vol. 27, No. 8, pp. 741-765, 2010.
https://doi.org/10.1002/mar.20354

[14] T. Heo, S. Hwang, “The Characteristics of Avatar Users according to Avatar Image -Focus on utilization state, body-esteem, and self-esteem-”, J Korean Soc Cloth Text, Vol. 28, No. 5, pp. 648-657, 2004.
https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE09804212

[15] S. Trepte, & L. Reinecke, “Avatar creation and video game enjoyment: Effects of life-satisfaction, game competitiveness, and identification with the avatar”, Journal of Media Psychology: Theories, Methods, and Applications, Vol. 22, No. 4, 2010.
https://doi.org/10.1027/1864-1105/a000022

[16] K. Bessière, A. F. Seay, & S. Kiesler, “The ideal elf: Identity exploration in World of Warcraft”, Cyberpsychology & behavior, Vol. 10, No. 4, pp. 530-535, 2007. https://doi.org/10.1089/cpb.2007.9994

[17] S. A. A. Jin, “Avatars mirroring the actual self versus projecting the ideal self: The effects of self-priming on interactivity and immersion in an exergame, Wii Fit”, CyberPsychology & Behavior, Vol. 12, No. 6, pp. 761-765, 2009.
https://doi.org/10.1089/cpb.2009.0130

[18] S. Yang, Y. Ha & M. Jeong, “Convergence Relationships among Body-esteem, Obesity Stress, Self-esteem, Weight Control Behavior in High School Girls”, Journal of Digital Convergence, Vol. 15, No. 3, pp. 237-245, 2017.
https://doi.org/10.14400/jdc.2017.15.3.237

[19] J. Cohen, “Defining identification: A theoretical look at the identification of audiences with media characters”, Mass communication & society, Vol. 4, No. 3, pp. 245-264, 2001.
https://doi.org/10.1207/s15327825mcs0403_01

[20] C. Klimmt, D. Hefner & P. Vorderer, “The video game experience as “true” identification: A theory of enjoyable alterations of players’ self-perception”, Communication theory, Vol. 19, No. 4, pp. 351-373, 2009.
https://doi.org/10.1111/j.1468-2885.2009.01347.x

[21] T. E. Kawk & H. J. Jeon, “The Effects of Attachment, Friendship, Avatars Image Decoration Needs, and Avatars Identification on Internet Addiction Tendency among Elementary School Children”, Korean Journal of Child Studies, Vol. 31, No. 2, pp. 103-117, 2010.

https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE07084407

[22] V. Looy, Jan, C. Courtois & M. D. Vocht, “Player identification in online games: Validation of a scale for measuring identification in MMORPGs”, Proceedings of the 3rd International Conference on Fun and Games. 2010.
https://doi.org/10.1145/1823818.1823832

[23] B. Li, & M. Lwin, “Player see, player do: Testing an exergame motivation model based on the influence of the self avatar”, Computers in Human Behavior, Vol. 59, pp. 350-357, 2016.
https://doi.org/10.1016/j.chb.2016.02.034

[24] V. Midha & A. Nandedkar, “Impact of similarity between avatar and their users on their perceived identifiability: Evidence from virtual teams in Second Life platform”, Computers in Human Behavior, Vol. 28, No. 3, pp. 929-932, 2012.
https://doi.org/10.1016/j.chb.2011.12.013

[25] W. Gim, “Korean Overall Body Esteem Scale(KOBES): Development, validation, and gender differences”, The Korean Journal of Woman Psychology, Vol.12, No.2, pp.231-253, 2007.
https://doi.org/10.18205/KPA.2007.12.2.009

[26] S. Lee, E. Lee & G. Ahn, “A Relationship on Body Esteem, Self Esteem and Eating Behavior of Nursing Students”, Society for the Convergence of Humanities, Social Sciences and Technology, Vol.9, No.6, pp.527-539, 2019.
https://doi.org/10.35873/ajmahs.2019.9.6.051

[27] Y. Hwang, “The Relation between Narcissistic and Cosmetics Shopping Orientation of Consumers”, Journal of the Korean Society of Clothing Industry, Vol.11, No. 2, pp. 326-336, 2009.
https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE08795022

[28] Y. Hwang, “Consumers’ Type According to Narcissistic Orientation and Consumption Value of Apparel Products and Cosmetics”, Journal of the Korean Society of Clothing Industry, Vol. 13, No. 3, pp. 364-372, 2011.
https://doi.org/10.5805/ksci.2011.13.3.364

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