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Gaming Avatar Can Influence Sustainable Healthy Lifestyle: Be Like an Avatar

**Xuhui Wang, Asad Hassan Butt *, Qilin Zhang *, Muhammad Nouman Shafique,
Hassaan Ahmad and Zahid Nawaz**

School of Business Administration, Dongbei University of Finance and Economics, Dalian 116025, China;
xhwang666@126.com (X.W.); shafique.nouman@gmail.com (M.N.S.); hassaan1214@hotmail.com (H.A.);
zahid.n@live.com (Z.N.)

* Correspondence: asadhassanbutt36@hotmail.com (A.H.B.); sdzhangqilin@126.com (Q.Z.)

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Abstract: Online gaming is consistently changing with the use of new technologies and seen as making an impact on consumers' sustainable lifestyles. The gaming avatars have influenced low avatar identification players to engage in physical and learning activities through massively multiplayer online (MMO) game genre. The fundamental purpose of the study is to classify the association of an avatar with consumer's behavioural intention for exercise and to consume healthy food. This study incorporates three theories: social cognitive theory (SCT), social determination theory (SDT) and player-avatar identification (PAI) theory to determine its four dimensions' impact on exercise and healthy food intention to attain a sustainable healthy lifestyle. SCT is related to human cognitive behaviour in the light of immersive experience, self-presence, and enjoyment. SDT related to the physical aspects of consumers that are exercise intention and consumption of healthy food. The results have shown that immersive experience, self-presence and enjoyment do impact the consumer's behavioural intention towards an individual's sustainability.

Keywords: avatar identification; massively multiplayer online; online video games; sustainable healthy lifestyle; players' intention

1. Introduction

In recent decades, online role-play gaming that is massively multiplayer online (MMO), massively multiplayer online role-playing game (MMORPG), role-playing game (RPG) and augmented reality games play has increased among adolescents. Moreover, it is inducing youngsters to engage in diverse physical activities that can benefit them in the form of learning and a healthy, sustainable lifestyle. The recent example for youngsters that involved them in physical activities was the game called "Pokemon Go." Gaming combing with the physical features to make youngsters in understanding a good and sustainable healthy life. The concept of Sustainability has taken over the world and its tools to measure the results with different techniques as footprints [1]. Through research, it is proven that more than 54% gamers love to play with others,, and in the previous study, a healthy lifestyle attained through games [2].

Moreover, 51% are more linked with friends, and 42% are spending more time with their loved ones [3] by playing games. Further, the aims of strong sustainability are not just about the economy and environment [4], but also related to the wellbeing and excellent living environmental benefits [5]. Sustainability also has many applications in different aspects, such as learning and education [6,7]. Sustainable healthy lifestyle is also essential for consumers' wellbeing, which can also be part of gaming if a gaming avatar can influence them. Gaming and sustainable healthy lifestyles can go side by side. Then again, it depends on which game genre can influence gamers to perform and make the

decision for physical tasks. MMO, MMORPG, RPG or augmented reality games can influence them for this; one can only know after the results. The MMO and MMORPG are different genres of games. Both genres are different.

Games study has revealed that players' playing with others and in clans are more positively loud in social connections [8]. Previously, a study focused on MMORPG explained many findings related to behaviour and learning during the gameplay [9]. Such games genre does provide learning and entertainment with a commercial purpose, but they also are the source of dangerous behaviours and aggressiveness [10,11]. Thus, learning-based games with the entertainment have shown effective results concerned with learning and health through the use of different technologies [12]. Furthermore, climate changes and environmental factors are influencing consumers to use organic or less chemical-free food products such as biscuits and chips, and so on [13]. For human development, social sustainability is considered to be very important [14]. Many game developers have come up with different forms of game consoles that involve consumers to have an immersive experience. Such games provide consumers to be fully involved in the gaming environment. For example, consoles like Xbox Kinect and Nintendo Wii paved the way for such an experience. Such games are known as exergames, where individuals are physically involved.

Moreover, in recent years, consumers' interest has gone down for exergames. Some gamers like to play games where they do not have to perform physical activities, and that could affect having lousy health among adolescents and increase weight among children [15–17]. Exciting games introduced that engage consumers, so consumers do also think of a healthy, sustainable lifestyle to connect with themselves with their avatar. Gaming Avatars perhaps can set the tone of the game with self-motivation factors to work hard and be like an avatar. Sustainability ideology is gaining awareness, and some firms are applying sustainability concepts [18,19]. Greener products' induction in the food supply chain management [20,21], consumers are alert of the perils that are involved in the environment and health issues.

Many factors affect consumers' way of thinking about exergaming and game entertainment e.g., graphical illustrations and male avatars of players [22,23]. Anthropomorphic avatars are found to be more uncomfortable and unappealing towards consumers when it comes to identity, i.e., anthropomorphic means characters that are more human-like animals or animals with special abilities [24]. Thus, such avatars do not have the captivating appeal and are labelled as "uncanny valley" [25]. Nevertheless, then again, consumers have their perceptions about avatars. In gaming, previous results show that avatars that presented as lifelike with masculine physiognomies even in cartoon form are fascinating. Such avatars are more dependable and worthy and are more likely to be preferred for representation in the game atmosphere [26]. Avatars may influence consumers' self-perception, individuality, attitudes and behavioural norms.

Li, Lwin and Jung [23] explain that avatar perceptions in online games have influence children in working on their body size and weight. It means that avatars can play a vital role in persuading consumers to do exercise and eat healthy food to stay fit. Avatars with standard body shape and size have a good effect compared to those with a massive physique. Peña and Kim [27] explored that gamers are exhibiting the same average body weight as their avatars showed good results in physical outlook. It is an understanding that better-looking avatars in an unrealistic environment can influence consumers to have a healthy lifestyle [28]. The paradigms in the paper described as follows (Table 1).

Table 1. Construct and definitions.

Construct	Definition	Reference
Player-Avatar Identification	a process where a gamer views himself as a character in the fantasy world and feels that he and the avatar are one and have the same emotional attachment.	[29]
Immersive Experience	An immersive experience is an illusory environment that surrounds one in an environment that makes one feel an integral part of it.	[30]
Self-Presence	Where one believes that he/she is relevant to the avatar character and emotionally involved in the gameplay.	[31]
Enjoyment	The level of exhilaration that an individual derives from playing a game.	[32]
Exercise Intention	It refers to the yearning of an individual to engage in following physical activity.	[33]
Behavioural Intention of Healthy food	It refers to the idea where different foods considered to be safe concerning quality and nutritious to consumers. Moreover, consumers are also concerned with the welfare of animals produced under the principle of sustainable growth	[34]

The primary purpose of this study is to explain two things. First, to understand that avatars can influence consumers to do exercise and get in shape in the MMO. Online gaming can be beneficial to consumers in different aspects, including physical benefits such as smart looks. The social factors and consumer behavioural intention have a close relationship in a sustainable environment [35]. This paper extends the knowledge in the field of online gaming avatars. Second, progress an idea of the impact of avatars on consumers' preferences to choose healthy food. A study with 250 students and inferences were evaluated by utilizing structural equation modelling on smart pls software.

2. Conceptual Framework and Hypotheses

2.1. Social Cognitive Theory (SCT)

One theory that used herein relates to psychosocial factors for online games, and avatars identification is the social cognitive theory (SCT) [31,36]. The theory states that individuals have the aptitude to process the information according to their will and further adds to cognitive activity that empowers them to absorb information and knowledge. This states that people tend to enjoy and value more when the behaviours are rewarding and engage further in learning. Enactive experience can help an individual learn more about behaviour and thus act according to the environment, which is beneficial to them, as stated by SCT [36]. Further, human behaviour is defined to be a triadic and dynamic relationship of personal goals, individual behaviour, and social environment in the light of SCT. The nature of such behaviour may influence consumers to participate in different activities [31,36,37], which may be beneficial for them. Such activities can be exercise and further to have healthy food. Thus, avatar identification can influence consumers to perform well according to the environment. Human cognitive processes are dependent on their self-efficacy, personal goals and environments [38]. Gamers can merge themselves with an immersive experience of the game and may believe that they are the actual avatar through self-presence and find the enjoyment in this process of believing that they can be like their gaming avatar.

Avatar identification for online games is a representation of the player itself and can help the player in decision making within his/her environment for their benefits during the gameplay—this engagement is called "mediated enactive experience" [39] during the game experience. SCT is a mechanism for the theoretical background but is not enough for avatar identification as the virtual environment is way different from the real environment. Bandura modelling experiments in such virtual environments helped in overcoming the physical barriers [40,41]. The model enabled the users to interact with their avatar and also with the others in the virtual environment. Thus, SCT theory

may provide the base for theoretical model building for avatar identification on consumers' intention to perform. SCT has provided the basis for many social psychology studies in the field of career, life-changing decisions, future goals, healthy lifestyles and motivations [42].

2.2. Social Determination Theory (SDT)

This theory states the learning of human motivation and behavioural aspects [43,44]. Social determination theory (SDT) further can be classified into intrinsic motivation, extrinsic motivation and amotivation [45]. Environment, people and nature motivate consumers to perform tasks in their daily life. In a virtual world, consumers can also be self-motivated, and self-efficacy measures can determine their choices to do different activities. The amotivation is related to light self-motivation, whereas intrinsic motivation states a sense of strong self-motivation [46,47]. The extrinsic motivation further divided into four components that attain a reward (praise), introjected (high self-esteem), identified (according to one's personality) and integrated regulation (volitional) [47]. Immersive experience can engage consumers in online video games and may produce favourable outcomes concerning avatar identification and lifestyle. Self-presence can determine how one is and as an avatar character in the game. Moreover, enjoyment can define an individual's entertainment value. These factors may influence the consumer to perform different task or activities. These could be exercise intention and changing the habits of eating healthy food in daily life. SDT may further endorse the gamers actions in the light of an individual's personal goals, intended behaviours, and identities adopted in the form of gaming avatars [48,49].

Player-avatar identification here is more concerned with intrinsic motivation and the identified component of extrinsic motivation. The intrinsic motivation has further three basic needs of human psychology; relatedness, autonomy and competence [50,51]. Autonomy is associated with free will; competence is about bringing desired results for oneself and relatedness refers to connecting with others. These needs are fulfilled with consumers engaging in different behavioural forms [43]. SDT has been worked upon by different researchers and has shown outcomes in performance, persistence and satisfaction [45,52]. Avatar identification can be related to this theory, and immersive experience can engage consumers in different behavioural outcomes.

2.3. Player-Avatar Identification (PAI)

The third proposed theory for the framework is player-avatar identification (PAI), which talks about the identification concept with media associated characters and the results on the identity progress [53]. Furthermore, Cohen proposed ten items in theory for player-avatar identification (PAI) [53]. In later studies, four components of the theory were taken into account and worked upon by different researchers. The PAI theory explains how a gamer is fully involved while playing different available games. These games can be of MMORP, RPG or MMO, and even augmented reality games can also be applied under the theory of PAI. Gaming avatars have evolved with time and with the availability of new technology. Thus, today we see new breeds of avatars, which in some cases look more human.

The components concerning PAI during gameplay are feelings, absorption, the importance of avatar, and positive attitudes [54]. PAI tells us how a player feels involved during the gameplay and how he/she believes that the avatar is a reflection of oneself. Thus, the players are emotionally and cognitively involved in gameplay with the avatars [53,55]. The proposed framework, according to two theories, is as follows in Figure 1:
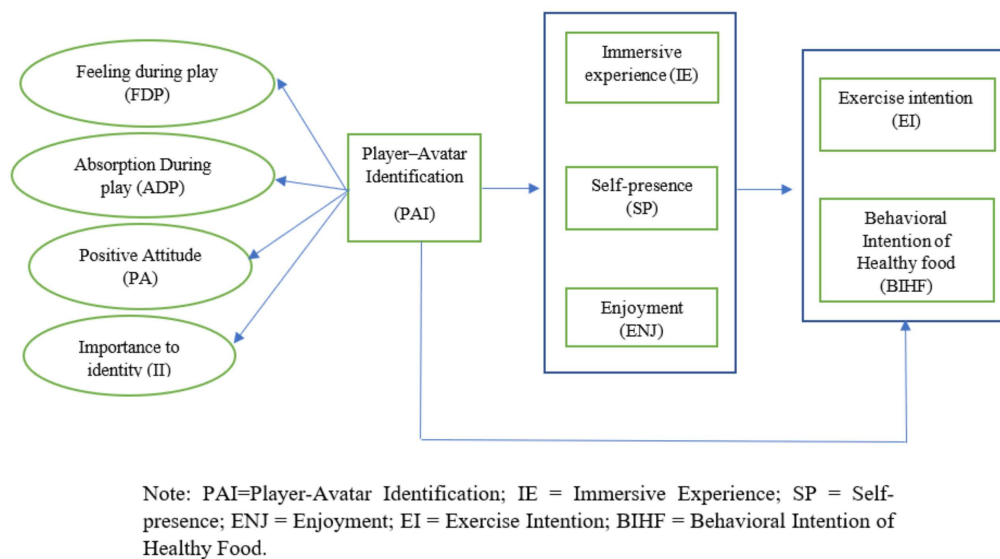
Note: PAI=Player-Avatar Identification; IE = Immersive Experience; SP = Self-presence; ENJ = Enjoyment; EI = Exercise Intention; BIHF = Behavioral Intention of Healthy Food.

Figure 1. Research framework.

3. Literature Review

3.1. Player-Avatar Identification (PAI)

The earliest reference for the term "identification" used by Freud related to an avatar. Later, it kept evolving and described a process where a viewer views himself as a character in the fantasy world and feels emotionally involved as the character and the person are the same [29]. Further terms used for avatar identification for online video games believe to have same meaning are: "player-avatar identification" [54], "character identification" [56], "avatar-self connection" [57], "avatar similarity" [58,59] and "self-reflecting avatar" [60]. In this paper, the term player-avatar identification is in connection with the PAI theory. Online video games and traditional media are different mediums altogether. Online games with dynamic avatars deliver high levels of personalization, interactivity, and selectivity [61]. Another aspect of identification is the merging of self and others [53]. In different researches, it has been showed that players treat themselves as one with the avatar, and users adopt the identity of the character [62].

Research has proven that online video game players believe that the characters which are durable, heroic and fearless are more rewarding and satisfactory and thus, are more emotionally and cognitively involved with the dimensions of PAI theory [62]. It is to believe that first, the player should have a positive attitude towards its avatar and, secondly, recognize the importance of its avatar during the gameplay.

Player-avatar identification is a construct having four dimensions, as discussed before, concerning PAI theory [54] or measured as a single construct also [63]. Overall the combined effect of player-avatar identification is taken. More and more realistic gameplay has been developed and players indulge themselves in connection to game characters both emotionally and cognitively. Such a connection can be explained in four contexts. The first context is "Feeling during play," which explains how a gamer feels what an avatar feels during the gameplay in online video gaming experience [54]. The second is "absorption," which explains how a gamer forgets about its surroundings and wholly indulged in its avatar role in the gameplay [54]. The third is "positive attitude toward the avatar," which refers to how a gamer praises and approves the characteristics of its avatar during the gameplay [54]. The fourth context is "importance to identity," which indicates the reflection of an avatar on the gamer itself [54]. These four dimensions of PAI can shed light on how consumers can be influenced by it and can perform actions on exercise intention and healthy food intention. PAI dimensions speak about gamers' involvement at its capacity to perform and do different things related to the game and in real life. These four dimensions can help understand the consumer's goals and perspective related to its

intention to perform exercises and eat healthy food under the influence of gaming avatars. This study is to check gamers' feelings towards the physical aspect of exercising and healthy food. In general, one who is exercising tends to eat healthy food. A healthy routine of exercising does lead to healthy eating. The consumer mindset may change with the use of PAI theory for influencing consumers intention.

3.1.1. Player-Avatar Identification (PAI) and Exercise Intention

Previously, studies have shown that exergames influence consumers' behavioural intentions towards different activities. It is appropriate to study both consumer emotions during gameplay and behavioural intention in different physical activities. Studies show that consumers showed interest in exercise intention after playing exergames [64,65]. This study checks the effect of avatar impact on consumers' intention to involve in physical exercises and healthy food consumption. The virtual world is changing consumer perceptions, and online gaming is changing rapidly with the help of new technologies. More and more new games keep on coming online that indulge consumers in trying new things in a virtual environment. Different game genres also influence consumers to try different gaming aspects that can lead to different physical and emotional activities. The best example of recent time is "Pokemon Go". This type of game is an augmented reality genre that made gamers go walking, exercise and performs tasks, which is an excellent health routine.

Online game characters and avatars with the right body image and clothing can help gamers in adopting suitable physical activities. It can help to increase physical performance, self-esteem and health [66–68]. Many studies have established that the more the consumer is involved in exergames can lead to more physical activities, i.e., exercise intention to look like one's avatar. Hence, the following hypothesis was proposed:

Hypothesis 1a (H1a). *PAI positively connected with exercise intention.*

3.1.2. Player-Avatar Identification and Healthy Food Intention

Consumers of today are concerned with their health due to a lot of information available and thus wish to consume good quality food [69]. There are growing concerns over food quality and environmental sustainability [70]. Good quality food consumption is on the high rise among consumers because consumers are becoming health conscious [71,72]. The percentage of people who like to go for good quality food has risen around the world and especially among those who have high incomes and good education [34,73]. Consumers are getting more conscious about the environment, and food traits are increasingly an apprehension for youngsters [74].

Food is not just about good quality but also food safety and the environment [75]. Food habits take time to change unless there is a rapid change in the self-body features. Humans wish to try different foods but still stay intact with conventional foods and food habits. Previous studies of gaming and food consumption show that it may influence individuals to have a healthy routine. Avatars in online video games have become more realistic and more satisfying with the player's needs. Basically, the form of style and the physical outlook is being praised by gamers in their avatars. Consumers are willing to do things to look physically good by consuming more healthy foods [76]. This study checks whether avatars in online video games influence consumers to eat healthy food. Thus, we proposed the following hypotheses:

Hypothesis 1b (H1b). *Player-avatar identification (PAI) is positively associated with healthy food intention.*

Hypothesis 1c (H1c). *Player-avatar identification (PAI) is positively associated with immersive experience.*

Hypothesis 1d (H1d). *Player-avatar identification (PAI) is positively associated with self-presence.*

Hypothesis 1e (H1e). *Player-avatar identification (PAI) is positively associated with enjoyment.*

3.2. The Mediating Role of Immersive Experience

Gamers can achieve intrinsic motivation with relatedness, according to SDT. Further, human emotions can engage the gamers to get fully involved in gameplay. Furthermore, a new gaming avatar can produce good self-efficacy results in the light of SCT. Immersive experience always helps in determining human cognitive thoughts about different aspects of behaviour. Previous studies have shown that immersive experience plays a vital role in gamers during the gameplay [77]. An individual feels more related to the game when he is more connected with others during the gameplay [78]. Another study showed in the field of music that immersive experience does impact individuals in learning and performing [79]. Previous studies show that players are more immersed in narrative, incorporeal and emotional facets of the gameplay if it is to believe that affiliation requirements contented within the game environment [80]. Immersive experience can help gamers to learn about their environment and involved in the abilities of the game character [81]. Their avatars can influence online video game players. Social interactions among other players and the player avatar identification can lead to beneficial results for gamers according to their emotional, physical and psychological needs [82].

Another study showed that immersive experience has a high impact on consumer acceptability to perform tasks or activities [83]. It is reasonable to believe that immersive experience can mediate between avatar identification and exercise intention and healthy food intention. The virtual environment is engaging, and online video games graphical representation has immensely increased. So the gaming world is becoming a commonplace, and immersive experience can make consumers feel connected with other players [30,84]. We propose the following hypotheses for immersive experience:

Hypothesis 2a (H2a). *Immersive experience mediates between player-avatar identification and exercise intention.*

Hypothesis 2b (H2b). *Immersive experience mediates between player-avatar identification and healthy food intention.*

3.3. Mediating Effect of Self-Presence

Self-presence is a concept where one believes that he/she is relevant to the avatar character. The SCT can influence the self-presence of gamers where they have the chance to learn and engage in different behavioural activities [31,37]. Gamers are motivated to learn and engage more when they believe the result is rewarding and satisfactory. Consumers behave towards the enactive experience when they are directly involved with their avatar [36].

Self-presence can mediate between the avatars and the exercise intention and healthy food intention. The previous study showed that the higher the self-presence during the gameplay, the higher will be an individual's ability to perform physical activities or tasks [85,86]. During self-presence, individuals feel that they are immersed in the gaming environment and believe they are part of it [87]. Online gaming has made an impact on consumer behavioural intention through avatars and thus creates a stimulating environment for the players. The virtual world is transforming the perceptions of online users by providing such an environment where one believes that they are engaging in real-world and consumer decisions based on this virtual world more than the physical one [88,89]. The influence of SCT on self-presence makes the players believe that their avatars are real and can lead to decision-making about physical and behavioural activities [87]. Previous studies have shown that gamers not only feel empathy towards their avatar, which is a crucial element for self-presence, but they also measure their involvement within the game character [57,90]. In previous studies, it was shown that self-presence can be a crucial component in an online video game environment and can influence the gamer to be emotionally and cognitively involved in his/her behavioural intention decision making [91,92]. We propose the following hypotheses:

Hypothesis 3a (H3a). *Self-presence mediates between player-avatar identification and exercise intention.*

Hypothesis 3b (H3b). *Self-presence mediates between player-avatar identification and healthy food intention.*

3.4. Mediating Effect of Enjoyment

Enjoyment in social media and online video games has expressed more than just entertainment. The studies have shown in the past that enjoyment established attention for gaming experience [93–95]. Enjoyment can be a crucial element for mediation in entertainment experience, and individuals' involvement in this environment prompts him to engage in outcomes such as behavioural pronouncements and erudition [32]. Moreover, as the game progresses, the consumer gets more involved in the avatar character and they start believing the actions of the character as vital to himself. An individual's sense of being in this environment is essential to enjoyment. Thus, enjoyment impacts on the consumer while playing with their avatar during the gameplay [96,97].

Here in this study, we see enjoyment as a separate mediating attribute towards avatar identification and exercise and healthy food intention. Thus, enjoyment mediates the entertainment experience within the variables of the proposed framework [92]. The avatar character can influence the consumer to derive feelings of enjoyment as his/her character evolves during the gameplay. The fun and exhilaration attribute during gameplay can enhance an individual's motivation and involvement [98]. We propose the following hypotheses:

Hypothesis 4a (H4a). *Enjoyment mediates between player-avatar identification and exercise intention.*

Hypothesis 4b (H4b). *Enjoyment mediates between player-avatar identification and health food intention.*

4. Methodology

4.1. Construct Measures and Selection

The scales and items are adapted from prior relevant studies. The items were measured on a seven-point Likert scale (1 = "strongly disagree" to 7 = "strongly agree"). The constructs items are adapted, and the questionnaire with references can be seen in the Appendix A. Initially, the scales were in the English version, so to safeguard the uniformity of the gist, the back-translation technique was used to confirm those measurement items in the Chinese version are parallel with the original version of English. We confirmed the translated questionnaire version with three undergraduate students, one master student and one professor in the business school for feedback. Based on the feedback, minor vicissitudes to the wording of some items were finalized (See Appendix A). The data was collected from the respondents who have had less than one year of experience in gaming, especially related to the MMO game genre. MMORPG and RPG games are famous among youngsters, and so is the MMO games.

Here, for this study, the MMO game genre was chosen. The game chosen for this study was PUBG, and currently, it goes by the new name called "Game for Peace." The respondents in this study had less than one year of experience of this type of gaming and perhaps indulged in some other gaming aspects. The reason for not choosing respondents with high gaming experience gamers was that this study related to those gamers who may be influenced by gaming avatars to have a healthy lifestyle and be motivated by their avatars. Furthermore, consumers with high gaming experience tend to have a bad healthy lifestyle and indulge more in indoor activities than outdoor activities. Thus, it could mean that their connection with the outside world in the form of friends and family is low and not that strong. We wanted to understand the perception of consumers with the low experience of gaming aptitude and intentions towards choosing a healthy lifestyle.

4.2. Data Collection and Sample

The data collected from survey invitations on WeChat, QQ and Weibo social media platforms with a 43-item scale, including nine demographic items. The PAI had four dimensions, namely feelings during play (FDB—four items), absorption during play (ADP—three items), positive attitude (PA—four items) and importance to identity (II—four items). Moreover, an immersive experience has two items; self-presence has four items and the enjoyment has four items. Finally, exercise intention has four items, and behavioural intention to have healthy food has five items. There was a total of 287 respondents based on a convenience sampling technique, and data was collected within September 2019. The respondents were preferably those who have had less than one year of experience of massively multiplayer online (MOO) gaming within the realm of China (See Table 2). However, a total of 250 respondents were included after the responses were carefully screened, demonstrating an 87% response rate. The number of responses screened was 37. There were a few reasons involved with such deletion of these respondents. One of the reasons was that some of the respondents had missing values. For this reason, not made part of the data analysis. The second reason was that there were some extreme responses in the data, which led to this understanding that either they were not interested in answering or just filled up without reading the questionnaire.

Table 2. Respondents profiles (250).

Characteristics	Distribution	Frequency	%
Gender	Male	161	64.4
	Female	89	35.6
Age	15-to-20	30	12
	21-to-25	183	73.2
	26-to-30	27	10.8
	31-to-35	10	4
Education	Bachelor	208	83.2
	Master	32	12.8
	PhD	10	4
Occupation	Student	229	91.6
	Job	21	8.4
	Business	0	0
Playing days per week	1-to-2 Days	90	36
	2-to-3 Days	21	8.4
	4-to-6 Days	34	13.6
	Everyday	105	42
Amount of time per day	1-to-2 Hours	63	25.2
	3-to-4 Hours	67	26.8
	> 5 Hours	120	48
Playing Place	Dorm	161	64.4
	PC Café	70	28
	House	7	2.8
	Others	3	1.2
	All	9	3.6
Do you think your food intake is healthy?	Yes	143	57.2
	No	107	42.8
Do you exercise daily?	Yes	123	49.2
	No	127	50.8

Another reason is that the data collected from different social media apps, and some responses were overlapping. Thus, they did not make it out of the final data analysis. The last reason for deleting some of the responses was that some profiles had the same features, thus deleted. Thus, they were deleted from the data to make the data more profound. At the time of data collection, we did not consider the gamers with 0 hours or 0 days because we wanted those respondents who have had less than one year of experience of playing MMO games. The data mainly are taken from university students during the university's ongoing semester. Mostly, students like to play games from their dorms or sometimes go out to play at PC cafes.

These are the reason most of our respondents showed the value of playing from their dorms. Furthermore, for data collection, we considered the universities of Dalian, and the respondents were either living or studying in Dalian at the time of response. We used different social media apps for this particular purpose to make sure that respondents are in Dalian. Of the respondents, 161 = 64% contributors were male and 89 = 36% contributors were female. About 83% of the responses came from bachelor students who were 18–25 years old.

4.3. Data Analysis

The data examined using SmartPLS 3 [99] and proposed hypotheses tested through SPSS 21. The SmartPLS was castoff to assess and construe the SEM model; however, SPSS gaged to understand descriptive analysis, including Skewness and Kurtosis (S&K). The S&K was used to understand the normality of the data [100]. The correlation carried out along with the mean and SDs of the given variables. Finally, the structural equation model (SEM) was applied to explore the relationships among the player-avatar identification, an immersive experience, the self-presence, the enjoyment, exercise intention and the behavioural intention for healthy food.

5. Results

Structural equation modelling (SEM) was used for the critical investigation for the explanation of the model fit. We also plaid the reliability and validity of the framework with composite reliability and average variance extracted. The factor loadings ranged from 0.571 to 0.943, which strongly indicates convergent validity. The model fit was measured with SEM using standardized root mean square residual (SRMR), path co-efficient and the Normal fit index (NFI).

In this part, we discuss different data analysis techniques to discuss reliability and validity.

5.1. Content Validity

Factor loadings of the data examined to approve the content validity of the conceptual framework [101,102]. The brink level for confirming validity is 0.60 [103], and only one item FDP3 is below 0.60. Overall the items were significantly loaded and surpassing the threshold level of 0.60. The details of the factor loadings shown in Table 3.

Table 3. The content validity and convergent validity.

Constructs	Indicators	Factor Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Feelings during play	FDP1	0.638			
	FDP2	0.662			
	FDP3	0.571			
	FDP4	0.800			
Absorption during play	ADP1	0.816			
	ADP2	0.854			
	ADP3	0.862	0.954	0.960	0.617
Positive Attitude	PA1	0.844			
	PA2	0.839			
	PA3	0.713			
	PA4	0.822			
Importance to identity	II1	0.806			
	II2	0.835			
	II3	0.826			
	II4	0.819			
Self-presence	SP 1	0.674	0.785	0.862	0.610
	SP 2	0.794			
	SP 3	0.822			
	SP 4	0.824			
Immersive Experience	IE1	0.942	0.874	0.941	0.888
	IE2	0.943			
Enjoyment	ENJ1	0.755	0.721	0.806	0.511
	ENJ2	0.740			
	ENJ3	0.624			
	ENJ4	0.732			
Exercise Intention	EI1	0.828	0.795	0.867	0.620
	EI2	0.811			
	EI3	0.762			
	EI4	0.745			
Behavioural Intention towards healthy food	BIHF1	0.798	0.818	0.873	0.579
	BIHF2	0.683			
	BIHF3	0.782			
	BIHF4	0.759			
	BIHF5	0.776			

5.2. Convergent Validity (CV)

To check the convergent validity (CV), we use Cronbach's alpha, the Composite reliability (CR) and the AVE. Table 3 shows the Cronbach's alpha value range amid 0.721 to 0.954, which is above the threshold of 0.70, as specified by Tenberge. Furthermore, the Composite reliability (CR) values range from 0.806 to 0.960 and are well above the threshold point of 0.70 as directed by [102]. Likewise, AVE is ranged between 0.510 to 0.888 and is above the cut-off point of 0.50 as directed by [102,104].

5.3. Discriminant Validity

This concept explains how the variables of a concept are different from another construct in the same conceptual framework [105]. It is resultant by corresponding to the square root of AVE value with the correlation values of a similar construct [105]. Table 4 shows the discriminant validity (DV) of the conceptual framework with demonstrated outcomes.

Table 4. Discriminant validity.

	Behavioural Intention For Healthy Food	Enjoyment	Exercise Intention	Immersive Experience	Player Avatar Identification	Self-Presence
BIHF	0.761					
ENJ	0.590	0.715				
EI	0.654	0.621	0.787			
IE	0.572	0.481	0.554	0.942		
PAI	0.666	0.505	0.559	0.682	0.785	
SP	0.647	0.623	0.545	0.607	0.599	0.781

5.4. Structural Model

Bootstrapping with an arbitrary sample of 5000 was routed to compute the outcomes for hypothesis testing as directed by [106,107]. The computed outcomes supported all the outcomes except two, i.e., IE to BIHF and SP to EI as shown in the Table 5 and details in Figure 2. First, the outcome of PAI with EI was accepted at $\beta = 0.187^{**}$, t = 2.293, ($p < 0.05$). The impact of PAI on BIHF was found to be substantial at $\beta = 0.355^{***}$, t = 4.792, ($p < 0.01$). Correspondingly, relationships such as H1c: PAI with IE, H1d: PAI with SP and H1e: PAI with ENJ are having a strong significance at $\beta = 0.682^{***}$, t = 12.415, ($p < 0.01$); $\beta = 0.599^{***}$, t = 8.574, ($p < 0.01$) and $\beta = 0.505^{***}$, t = 8.425, ($p < 0.01$); respectively. The relationship of IE with EI is accepted at $\beta = 0.196^{**}$, t = 2.008, ($p < 0.05$). Likewise, the relationship of SP with BIHF, ENJ with EI and ENJ with BIHF are significantly supported at $\beta = 0.256^{***}$, t = 3.269, ($p < 0.01$); $\beta = 0.388^{***}$, t = 6.648, ($p < 0.01$); and $\beta = 0.218^{***}$, t = 2.886, ($p < 0.01$); respectively. The effect of IE with BIHF proposed in H2a and SP with EI in H3a are found to be non-significant at $\beta = 0.069$, t = 0.819, ($p > 0.05$) and $\beta = 0.072$, t = 0.810, ($p > 0.05$).
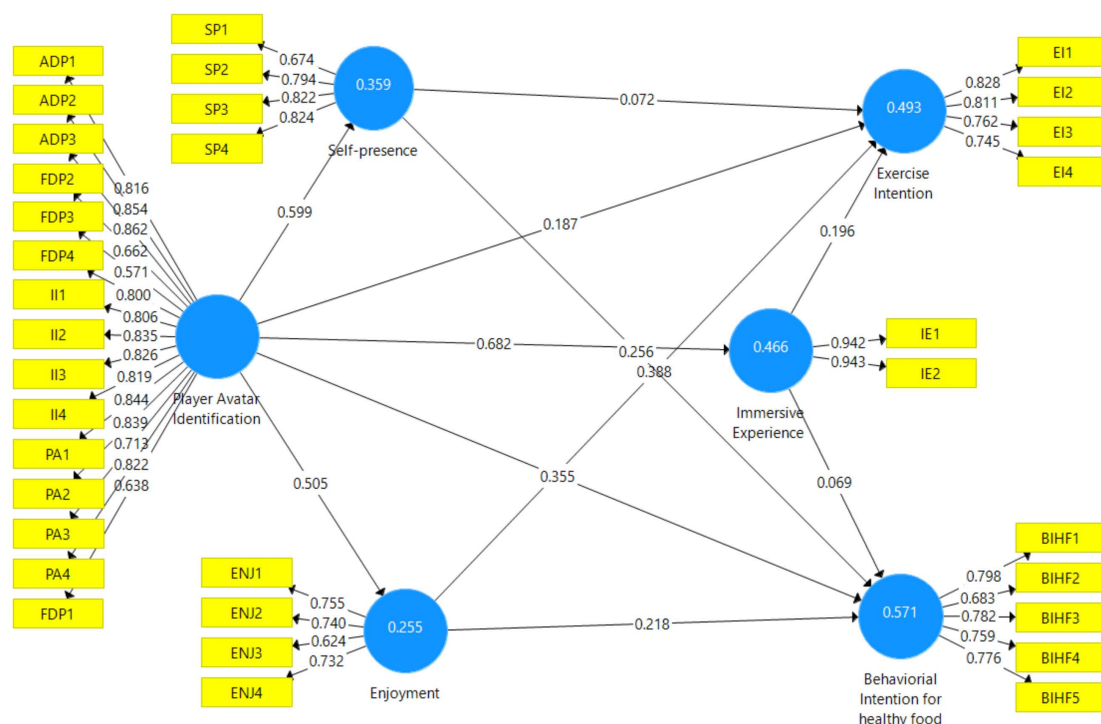

Figure 2. Structural model with path coefficients.

Table 5. Hypothesis testing.

Hypothesis			Path Coefficients	T Statistics	*p* Values	Decision
H1a	PAI	→	EI	0.187 **	2.293	0.022	Accepted
H1b	PAI	→	BIHF	0.355 ***	4.792	0.000	Accepted
H1c	PAI	→	IE	0.682 ***	12.415	0.000	Accepted
H1d	PAI	→	SP	0.599 ***	8.574	0.000	Accepted
H1e	PAI	→	ENJ	0.505 ***	8.425	0.000	Accepted

Note. H = hypothesis; PAI = player-avatar identification; IE = immersive experience; SP = self-presence; ENJ = enjoyment; EI = exercise intention; BIHF = behavioural intention towards healthy food; Bootstrapping sample = 5000. *** $p < 0.01$ and ** $p < 0.05$.

5.5. Mediation Analysis

The mediation analysis performed by ensuring the technique of SEM [108]. First, the direct effect of the variable PAI towards EI and BIHF investigated. Afterwards, an indirect effect with the mediator was examined, as shown in the Table 6. The results showed that PAI has a partial mediation relationship with IE and EI; SP and BIHF; ENJ and BIHF; and ENJ and EI, respectively. There was no mediation found of PAI with IE and BIHF and SP and EI.

Table 6. Mediation analysis.

Hypothesis						Path Coefficient	T Statistics	*p* Values	Indirect Effects
H2a	PAI	→	IE	→	EI	0.134	2.024	0.044	Partial Mediation
H2b	PAI	→	IE	→	BIHF	0.047	0.823	0.411	No mediation
H3a	PAI	→	SP	→	EI	0.043	0.787	0.432	No mediation
H3b	PAI	→	SP	→	BIHF	0.154	2.96	0.003	Partial Mediation
H4a	PAI	→	ENJ	→	EI	0.196	5.533	0.000	Partial Mediation
H4b	PAI	→	ENJ	→	BIHF	0.110	2.818	0.005	Partial Mediation

Note. H = hypothesis; PAI = player-avatar identification; IE = immersive experience; SP = self-presence; ENJ = enjoyment; EI = exercise intention; BIHF = behavioural intention towards healthy food

6. Discussion and Implications

6.1. Findings and Theoretical Implications

The study demonstrates that PAI has a bearing on consumer behavioural intention to do exercise and focus on healthy food. The four factors of PAI revealed good results and showed an excellent model-data fit. Preceding research has revealed associated with neuro study that consumers with penetrating cognitive involvement resemble the level of intimacy one experience when interrelating one another [109], and users of the avatars love their character identity when they interact [110]. Thus, this study supports PAI and its effects on consumers' intentions. In the study, only two hypotheses did not support, whereas the rest of the hypotheses accepted with the mediation. The previous study has shown that MMORPG games have made gamers addicted to it and thus disturbing their daily life in the form of unhealthy routine and unhealthy habits among college students [111]. MMORPG affects their lives, both physically and psychologically, every day due to game addiction.

Furthermore, studies have shown that MMORPG affects youngsters with their social life, where they are so much addicted to the game that they start believing that online social interaction is the same as real-life [112] and thus start feeling online gaming especially MMORPG as means of escapism from the reality [113]. RPG was another game genre that we did not include in our study. RPG allows the user to move around the gameplay with creative planning and to achieve a goal [114]. Furthermore, RPG provides a user with the ability to be an avatar under the rules of the game [115]. RPG games are readily available in all technological devices, board sets, and miniature forms available in the market [116,117]. We were more concerned with the use of the MMO game genre to under consumer perceptions and behaviour towards a healthy lifestyle.

The study only worked on the MMO game genre. Other game genres like MMORPG and RPG and augmented reality were not part of this study. MMO games can also influence consumers to do and perform different physical activities. Thus, players of MMO games can get influenced to do healthy activities such as gym and adopt good healthy food. More a player is involved in the game; more likely, he is to get feelings developed for its avatar and develop an identification one related to its personality [118,119]. Feelings during the play (FDP) and importance to identity (II) add value to the social cognitive theory [31], and the consumers are motivated with the identification of their avatars and are motivated to perform [44]. The positive attitude towards the avatar also showed a good relationship with the behavioural intention and increased in the immersion towards the player avatar identification [120,121]. In the future study, it can further explore in the light of sustainable learning environments and other forms of social media networks.

The digitalization of the world has made a life for the people somewhat ease on different social media formats in a wide range of areas [122]. In social media networks, identity becomes an essential factor for the players. Avatar identification or gaming avatars in MMORPG and RPG and augmented reality transformed to be more in the aspect of fantasy. Avatars in such genres are sometimes the reason for consumers to play such games. The same is the case with the MMO game genre where avatars are more human-like and behave like humans too. PAI is positively associated with self-presence, as the results showed. The more a player experiences self-presence during the gameplay, the more he or she relates with the avatar identification [31]. Enjoyment is a critical element of any work or games. Here, in the framework, we can see that enjoyment is also essential and mediated by the PAI and EI and BIHF. Thus, the higher the fun aspect is in the game, the better the results.

From the results, it inferred that users' perceived immersion as not an essential factor when it came to healthy food, whereas for exercise intention, it was ok. Consumers do get involved in gameplay depending on different environmental factors such as graphic and sound quality [30]. Perhaps, it requires further study to explore its true potential towards the consumer behavioural intention as the key is the quality of the gameplay that can make a player interact more with its avatar [123–125]. In the future, immersive experience is essential, and consumers do get involved, but perhaps in a controlled experimental environment, it can provide better results.

6.2. Implications for Game Developers

6.2.1. Real Lifelike Avatars

The study shows that the avatar personality influences consumers. Thus, it contributes to the theory and can provide a way for game developers to develop a more realistic or human-like avatar [56]. More consumers are concerning the avatars [57], and more consumers are satisfied with their life can help develop better identification [126]. The game developer companies can work on producing more real life-like avatars that players can associate themselves with it. Gaming itself is a fantasy, and so are the avatars, but consumers feel and believe they are part of their avatars and sometimes fully immersed in the character. More real life-like avatars in games can indulge gamers more to play and even learn and adopt good habits from such avatars. MMORPG and RPG games have different styles and avatar identification, which is more unrealistic. More realistic avatars may influence gamers more to be like them. Thus, not just emotionally be part of it, but can also be physically a part of it by transforming oneself into gaming avatar physical looks.

6.2.2. Artificial Intelligence (AI) within Avatar Character

Previous studies have shown that interacting with live players during gameplay can make consumers get more involved in the game [127,128]. Whereas the inclusion of new technology that is artificial intelligence (AI) may also have activities such as that. The more the avatar is real life-like then the player can also develop a significant association. Artificial intelligence (AI) can be a new game factor introduced in MMO or MMORPG or RPG games.

6.2.3. Strong Avatar Induction in Augmented Reality Game Genre

Furthermore, avatar development should not be limited to RPG, MMO or MMORG games. It can also be for virtual and augmented gameplay. Popular games like Pokémon [129] and Ingress [130] also have animated avatars, and studies have shown that they have engaged consumers in physical activities and learning environments. However, more games can be developed in this game genre and introduced with better avatars.

6.3. Research Limitations

The results of the study were favourable, but it met limitations also. The findings of this research were based only on 250 respondents. Furthermore, it had time limitations and budget constraints. The number of respondents can be increased to investigate further the role of PAI and its effect on consumer behavioural intention towards a sustainable healthy lifestyle [131]. In addition, the research was limited to one urban city of china, i.e., Dalian. It can be further investigated in different urban cities of China and can show better results.

The research was limited to the MMO game genre in this study. It can be further investigated into MMORPG, RPG and augmented game genre in the future study. Previous studies have shown that consumers do get involved during the gameplay and interact with other players and their avatars. Different game genres can provide diverse perspectives and fallouts. It was a cross-sectional study; it can be further explored with longitudinal studies and experimental designs also as it may provide in-depth analysis in the future. The reason why it was not taken as an experimental study was because, in this, we wanted to know the intentions of those gamers who have had less than one year experience of MMO gaming. Furthermore, we did not make a comparison of high gaming experiencers and low gaming experiencers because we only wanted to study those respondents or gamers who have had less than one year of experience of MMO gaming. The questionnaire was developed according to a cross-sectional study, and not in the frame of experimental study. At last, only mediation was used to study the variables. Furthermore, moderators can also be used in a future study to understand the paraphernalia of PAI.

7. Conclusions

This research paradigm supported the PAI paraphernalia on consumer behavioural intention towards exercise and healthy food. It deliberated in minutiae the four dimensions of PAI and its role towards consumer involvement in the gameplay. It augments value to the player avatar identification theory, social cognitive theory (SCT) and social determination theory (SDT). Furthermore, the findings were from mediation only, and more different aspects uncovered with the moderating roles of different variables in the same framework with the relationships of SP, IE, ENJ, EI and BIHF. Thus, imminent work is encouraged to work out the framework to reconnoitre the PAI dimensions further when probing avatar identification in the view of a sustainable healthy lifestyle.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Items adapted for the questionnaire.

Constructs		Measuring Items	Sources
	FDP1	When my avatar character is facing peril in the gameplay, I feel nervous.	
	FDP2	I feel the same displeasure my avatar feels when my avatar experiences failure in the game.	
	FDP3	When my avatar attains his/her goals, I feel happy.	
	FDP4	I feel the same joy my avatar experiences when a mission is accomplished.	
	ADP1	I forget my environmental settings during the game.	
	ADP2	I forget myself during the game.	
PAI	ADP3	I feel as if I am physically in the gameplay during the game.	[132]
	PA1	I never remorse that I play my game avatar.	
	PA2	I am pleased to play the avatar I am playing now.	
	PA3	Other game players are happy to be friends with my game avatar.	
	PA4	My co-gamers have a deep respect for my avatar.	
	II1	The avatar I play reflects who I am.	
	II2	My avatar and I are the same.	
	II3	The avatar I play inspires the way I feel about myself.	
	II4	The avatar I play is important to my sense of what kind of a person I am.	
IE	IE1	Online gaming experience makes me forget my instantaneous surroundings.	[82]
	IE2	Online gaming experience makes me forget the reality of the real world.	
	SP1	I become less aware of my environment settings during the game.	
SP	SP2	I become less aware of myself during the game.	[91,92]
	SP3	I lost track of time.	
	SP4	I feel emotionally involved in the game.	
	ENJ1	This game was fun to play.	
ENJ	ENJ2	I thought this game was reasonably entertaining.	[92]
	ENJ3	I would define this game is somewhat stimulating.	
	ENJ4	While I was playing, I was thinking about how much I enjoyed it.	
	EI1	I plan to exercise frequently in my leisure time in the next three months.	
	EI2	I will try to exercise frequently in my leisure time during the next three months.	
EI	EI3	I have decided to exercise frequently in my leisure time in the next three months.	[92]
	EI4	If it were entirely up to me, I am assured that I would be able to exercise frequently in my leisure time in the next three months.	
	BIHF1	I have the intention to buy healthy foods.	
	BIHF2	I will eat healthy foods for my wellbeing.	
BIHF	BIHF3	I have an aim to consume healthy foods as much as conceivable.	[74]
	BIHF4	I would like to spend more on healthy foods for better healthiness in my life.	
	BIHF5	I anticipate purchasing healthy foods to avoid sickness	

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