

Investigating the Continuance Intention to Play Massively Multiplayer Online Games

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ABSTRACT

Massively multiplayer online games (MMOGs) have been one of the fastest growing online entertainments and attracted a great sum of venture investment. Yet, little empirical research has been conducted to examine the interrelationship between gamers' motivations and post-adoption behaviors. This study attempted to explain gamers' continuance intention to play MMOGs by integrating motivations for playing MMOGs into the information systems (IS) continuance model. We conducted an online survey with 392 World of Warcraft gamers, and validated the model with structural equation modeling approach. With the majority of hypotheses being substantiated, our results revealed that the extended IS continuance model demonstrates satisfactory predictive power to gamers' continuance intention to play MMOGs. Achievement and immersion motivations were testified to positively associate with enjoyment, and that enjoyment and satisfaction jointly predict the continuance intention to play MMOGs. The study rounded off with theoretical and practical implications.

Keywords: Massively Multiplayer Online Games, IS Continuance, Enjoyment, Satisfaction, World of Warcraft

1. INTRODUCTION

The proliferation of personal computer and broadband network has provided a fertile ground for massively multiplayer online games (MMOGs) to flourish. MMOGs have emerged as a novel online entertainment in which thousands of gamers log into a server, customize their avatars, and start the journey in the virtual world. MMOGs have been recognized as one of the fastest growing online entertainments and attracted a great sum of venture investment. Recent marketing research forecasted that the revenue of MMOGs business worldwide would reach \$35 billion by 2018, up from \$21 billion in 2012 [PRWeb, 2013]. On average, gamers spend three hours per day and \$17 per month on MMOGs [PwC, 2012].

“What drives gamers to play MMOGs continuously?” Till now, it is still the fundamental and prominent research question for the game developers and researchers. The success of MMOGs hinges not only on attracting the initial trial, but also the retention of gamers. Gamers’ stickiness directly affects the revenue of MMOGs (e.g., monthly subscription fee or sales of virtual items), which in turn determines the capability of future game research and development. As the sustainability of MMOGs is critical, understanding the continuance intention is of prime importance to both game developers and researchers.

Today, studies examining the post-adoption behaviors of hedonic information systems remain scarce [e.g., Venkatesh et al. 2011; Zhou et al. 2012]. Though being one of the most popular forms of hedonic IS, the continuance behaviors of MMOGs have not received a commensurate academic focus. The majority of studies on MMOGs focus on understanding gamers’ pre-adoption, purchase and usage intention [e.g., Guo & Barnes, 2012; Hsu & Lu, 2007; Lee, 2009; Wu & Liu, 2007]. There is a lack of in-depth analysis towards the post-adoption behaviors among MMOG gamers in the mainstream IS literature.

With respect to the aforementioned issues, this study aims to examine the continuance intention to play MMOGs by extending the IS continuance model. This study also addresses the call from Benbasat and Zmud [2003] to incorporate context specific variables into IS research. Specifically, three overarching motivations to play MMOGs as proposed by Yee [2006] were integrated into the IS continuance model; and that usefulness in the continuance model was replaced by enjoyment to fit into the context of hedonic IS. The findings provide researchers and practitioners with substantial insights into MMOG research and development. Further, the validated integrative framework provides a foundation for future research of post-adoption behaviors of hedonic IS.

The rest of paper is organized as follows. The next section provides a comprehensive literature on related concepts, and depicts the hypotheses development and methodology. Subsequently, it reveals the results of data analysis and model estimations. Finally, the paper rounds off with the implications, limitations and future research directions.

2. THEORETICAL BACKGROUND

2.1. The Information Systems Continuance Model

The expectation-confirmation model of IS continuance was first introduced to address and distinguish the difference between users' pre- and post-adoption behaviors in using information systems [Bhattacharjee, 2001]. The model conceptualizes the distinctive difference between acceptance and continuance behaviors by examining users' cognitive beliefs and affects. Specifically, the model posits that users' continuance intention to use information systems depends on three predictors, namely perceived usefulness, satisfaction with the system, and the extent of confirmation of expectations.

Empirical studies have confirmed the adaptability and predictive power of the IS continuance model [e.g., Barnes & Böhringer, 2011; Bhattacharjee, Perols, & Sanford, 2008]. For example, Barnes and Böhringer [2011] tested the IS continuance model in the context of micro-blogging. Bhattacharjee et al. [2008] tested the model with field data from a longitudinal survey of document management system. Chong [2013] extended the model to study the continuance intention of mobile commerce, and revealed that satisfaction, usefulness, ease of use, and enjoyment significantly predict consumers' continuance intention of mobile commerce.

2.2. Enjoyment and Hedonic Information Systems Use

The link between enjoyment and hedonic IS use has often been theorized [Bhattacharjee, 2001; Lin & Bhattacharjee, 2010]. The term "*hedonic*" is derived from the word "*hedonism*", a term introduced to symbolize the doctrine that happiness is the chief good in life [Merriam-Webster & Credo, 2003]. Prior studies of hedonic IS have suggested that enjoyment is one of the most dominant determinants of intention to use hedonic IS and might surpass usefulness [Choi & Kim, 2004; van der Heijden, 2004]. Usefulness is defined as "*the degree to which a person believes that using a particular system would enhance his or her job performance*" [Davis, 1989]. Enjoyment is defined as "*the extent to which the activity of*

using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated" [Davis, Bagozzi, & Warshaw, 1992]. Usefulness is known as an extrinsic motivation, whereas enjoyment is described as an intrinsic motivation [Davis et al., 1992]. Instead of offering instrumental values to the users, such as increasing task performance, hedonic IS [e.g., MMOGs] focuses on the fun aspect of use [Lin & Bhattacharjee, 2010]. The ultimate goal of hedonic technologies is to provide self-fulfilling and pleasure experiences to users [Ha, Yoon, & Choi, 2007; van der Heijden, 2004].

2.3. Motivations to Play MMOGs

Bartle, a pioneer developer of multiplayer computer games, has introduced taxonomy of Multi-User Dungeon [MUD] gamers, suggesting that gamers consist of four types: Killers, Achievers, Socializers and Explorers [Bartle, 1996]. Killers opt to act on gamers; socializers wish to interact with gamers; achievers seek for accomplishment; and explorers prefer to discover the virtual world. Building upon Bartle's framework, Yee [2006] proposed a categorization of gamers' motivations to play MMOGs, including achievement, social, and immersion. These motivations are further divided into ten corresponding components [i.e., Achievement: advancement, mechanics, competition; Social: socializing, relationship, teamwork; Immersion: discovery, role-playing, customization, escapism]. Gamers who are achievement oriented desire to gain power and progress rapidly, and to compete with others; gamers who are social oriented desire to interact and help each other, as well as to build relationships; gamers who are immersion oriented desire to embrace the fantasy of the virtual world and get rid of real-life problems [Yee, 2006].

The enjoyment of playing MMOGs is highly associated with these motivations. For example, some gamers become thrilled when they witness the progression of their characters, such as leveling up or learning new skills. On the other side, some gamers enjoy interacting and cooperating with others via the guild system and team-seeking function. These kinds of social interactions foster the development of relationships and enrich gamers' online social interactions. Furthermore, gamers could also temporarily get rid of their real life problems by exploring the fantasies in the virtual world. Yee [2006, 2012] has substantiated that the dynamic designs and infrastructures of MMOGs make attainments of achievement, socialization, and immersion easy and instantaneous.

3. RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

To examine the continuance intention to play MMOGs, we proposed a research model by extending the well-established and validated expectation-confirmation model of IS continuance [Bhattacharjee, 2001] by incorporating three motivations of playing MMOGs [Yee, 2006]. The extended model studies the continuance intention in the context of MMOGs and examines how motivations of playing MMOGs influence the continuance intention. In particular, achievement, social and immersion motivations are hypothesized to positively associate with enjoyment, which in turns influences gamers' continuance intention to play MMOGs through confirmation and satisfaction. Figure 1 depicts the research model.

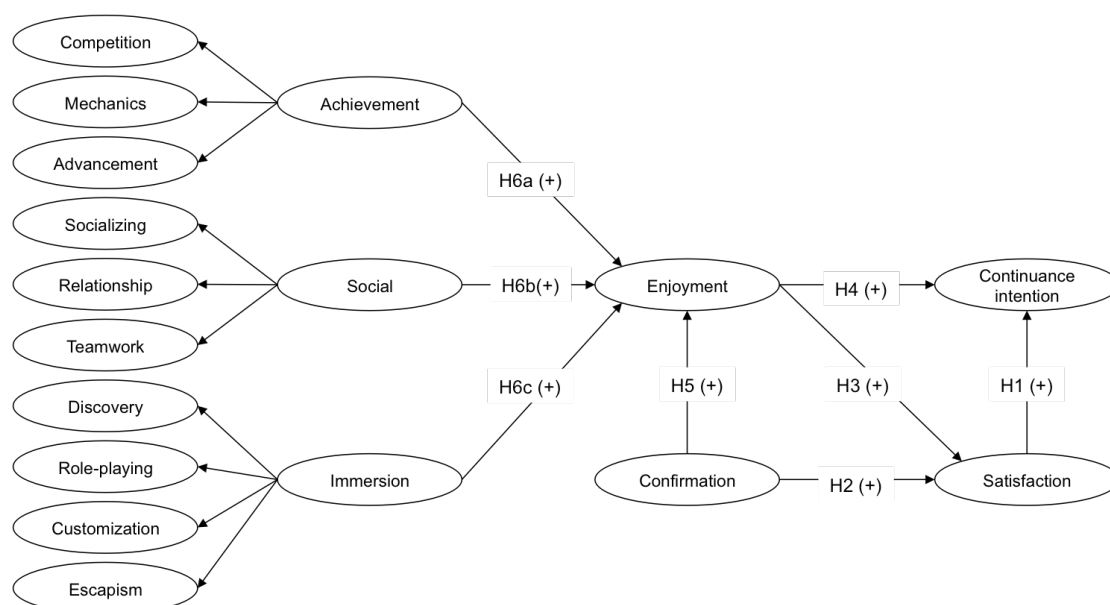


Figure 1. Research Model

3.1. Satisfaction and Continuance Intention to Play MMOGs

Satisfaction refers to a pleasurable or positive emotional state resulting from the appraisal of an object or activity [Locke, 1976]. In behavioral IS research, satisfaction is recognized as a crucial factor for examining users' continuance intention or post-adoption behaviors [DeLone & McLean, 1992; Melone, 1990]. Prior studies suggested that satisfaction plays a significant role in predicting the behavioral intention to use information systems [e.g., Choi, Lee, & Soriano, 2009; DeLone & McLean, 1992; Shih, 2004; Wang, Sy, & Fang, 2010]. Specifically, with respect to the continuance intention to use hedonic IS, such as online shopping [Wen, Prybutok, & Xu, 2011], social network sites [Barnes & Böhringer, 2011; Cao et al., 2013], online gaming [Holsapple & Wu, 2008] and mobile Internet services [Thong, Hong, & Tam, 2006], satisfaction is also found to be a dominant predictor. For example,

Barnes and Böhringer [2011] revealed a positive relationship between satisfaction and the continuance intention among Twitter users. Similarly, we believe that satisfaction will play an important role in determining gamers' continuance intention to play MMOGs. Thus:

H1: Gamers' extent of satisfaction is positively associated with the continuance intention to play MMOGs.

3.2. Confirmation and Satisfaction

Confirmation refers to the extent to which performance meets expectation [Bhattacharjee, 2001]. When users confirm the expected performance of using information systems, they are more likely to be satisfied. Empirical studies have corroborated the positive relationship between confirmation and satisfaction in hedonic IS uses, such as social network service [Cao et al., 2013], mobile Internet service [Thong et al., 2006] and online shopping [Deng et al., 2010; Wen et al., 2011]. For example, Cao et al. [2013] reported that confirmation is a significant predictor of satisfaction in social network services. Considering MMOGs, some gamers seek for excitement and challenges, while others may look for social interactions. Regardless of the diverse motivations that gamers toted, once their expectation is confirmed, they are likely to be satisfied. Thus:

H2: Gamers' extent of confirmation is positively associated with satisfaction in playing MMOGs.

3.3. Enjoyment and Satisfaction

Enjoyment represents the key user belief that the use of information systems is pleasurable and enjoyable [Lin & Bhattacharjee, 2010]. Enjoyment was found highly associated with satisfaction across different contexts. The study of emotional experience and satisfaction was first investigated in the marketing literature, where enjoyment was found to highly associate with satisfaction [Oliver, 1992]. In a study of shopping experience, enjoyment contributed to the attainment of satisfaction [Lee, Pi, Kwok, & Huynh, 2003]. Empirical studies also revealed that enjoyment strongly influences satisfaction among mobile Internet users [Thong et al., 2006] and online gamers [Holsapple & Wu, 2008]. Therefore, we believe that when gamers derive enjoyment from playing MMOGs, they are more likely to be satisfied. Thus:

H3: Gamers' extent of enjoyment is positively associated with satisfaction in playing MMOGs.

3.4. Enjoyment and Continuance Intention to Play MMOGs

The IS continuance model hypothesizes that usefulness could be a direct predictor of the continuance intention (in addition to its indirect effect via satisfaction), to account for circumstances where high instrumental considerations may supersede low affect in motivating usage intentions [Bhattacharjee, 2001]. Prior literature has confirmed the direct association between enjoyment and behavioral intention in the contexts of online game [Holsapple & Wu, 2008], online shopping [Wen et al., 2011], social networking sites [Kim, Shim, & Ahn, 2011], mobile Internet services [Thong et al., 2006] and mobile entertainment [Kim, Kim, & Kil, 2009]. For example, Agrifoglio and colleagues [2012] suggested that intrinsic motivations [e.g., enjoyment] are positively related to the continued Twitter usage. Barnes [2011] reported that enjoyment is a significant predictor of gamers' continuance intention in the virtual world. Similarly, if gamers perceive high enjoyment from playing MMOGs, they are more likely to play continuously. Thus:

H4: Gamers' extent of enjoyment is positively associated with the continuance intention to play MMOGs.

3.5. Confirmation and Enjoyment

Confirmation and usefulness are hypothesized to be positively related in the IS continuance model [Bhattacharjee, 2001]. This link is derived from cognitive dissonance theory [Festinger, 1957], which suggests that users may experience cognitive dissonance or psychological tension if their pre-acceptance usefulness perceptions (which led to acceptance) are disconfirmed during actual use. Rational users may attempt to rectify the discrepancy by distorting or adjusting the usefulness perception so that it aligns with the actual condition. In the context of MMOGs, once gamers' initial expectation is not concrete due to the unfamiliarity of the game, and gamers would adjust their perception of enjoyment by comparing with their confirmation. Past study also provided support towards this argument, where confirmation is found to be significantly correlated with perceived enjoyment in the context of online games [Thong et al., 2006]. Thus:

H5: Gamers' extent of confirmation is positively associated with enjoyment of in playing MMOGs.

3.6. Motivations to Play MMOGs and Enjoyment

The dynamic designs and infrastructures of MMOGs make attainments of achievement,

socialization and immersion in MMOGs easy and instantaneous [Yee, 2006]. Gamers derive enjoyment and fun upon playing MMOGs with their motives fulfilled simultaneously.

Achievement motivation consists of subcomponents of *advancement*, *mechanics*, and *competition* [Yee, 2006]. Gamers derive enjoyment from accomplishing achievement in game. For instance, they can gain power and progress rapidly, and accumulate in-game symbols of wealth or status. They can also acquire a deep understanding of the underlying mechanism of the game, enabling them to excel in game. Prior literature has suggested that incorporating reasonable challenges and available goals in games could make the game fun, and thus induce optimal playing experience [Malone & Lepper, 1987; Snodgrass et al., 2012].

Social motivation consists of subcomponents of *socializing*, *relationship*, and *teamwork* [Yee, 2006]. Gamers derive enjoyment from interacting with others in-game. For example, gamers attain fun from collaborating with guild members, and developing long-term and meaningful relationships [Snodgrass et al., 2012]. Myriad social interaction is therefore believed to provide pleasurable experience to gamers.

Immersion motivation consists of subcomponents of *discovery*, *role-playing*, *customization*, and *escapism*. Gamers enjoy immersing into the fantasy of the virtual world, exploring the hidden things, and/or getting rid of real-life problems [Snodgrass et al., 2012]. To sum, the greater the extent of gamers' motive for achievement, social, and immersion, the more the enjoyment they would derive upon playing MMOGs. Thus:

H6a: Achievement motive is positively associated with enjoyment in playing MMOGs.

H6b: Social motive is positively associated with enjoyment in playing MMOGs.

H6c: Immersion is positively associated with enjoyment in playing MMOGs.

4. RESEARCH METHODOLOGY

4.1. Sample and Data Collection

We chose World of Warcraft (WoW) as the target in this study for its long history, popularity and highly diversified gamer profile. In the first quarter of 2013, the active subscription number of WoW reached 8.3 million worldwide, comprising gamers from North America, Europe, China, Korea and Australia gamers [Blizzard, 2013]. We believed that WoW is a representative and appropriate content for examining MMOG users' continuance intention.

We conducted an online survey to empirically test the proposed model. In order to

improve the response rate as well as sample quality and representativeness, we employed a market research firm for data collection. A total of 392 valid responses were obtained for subsequent analysis. Respondents aged between 15 and 50. The sample comprises 43.1 percent female and 56.9 percent male gamers. More than 80 percent of gamers have at least three years of experience in playing WoW. Half of the respondents spent more than fourteen hours per week playing WoW.

4.2. Measures

Items pertaining to all focal constructs were adapted from prior literature and were with well-established psychometric properties. Items were modified to fit into the context of the current study. All measured were taken on seven-point Likert scales, from “1=strongly disagree” to “7=strongly agree”. Table 1 lists the measurement items.

Construct	Item	
How important are the following things to you when playing WoW [Yee, 2006]:		
Advancement	ADV01	Leveling up your character as fast as possible.
	ADV02	Acquiring rare items that most players will never have.
	ADV03	Becoming powerful.
	ADV04	Accumulating resources, items or money.
	ADV05	Becoming well-known in the game.
	ADV06	Being part of a serious, raid/loot-oriented guild.
Mechanics	MEC01	Knowing the precise numbers and percentages underlying the game mechanics.
	MEC02	Optimizing your character as much as possible for their profession/role.
	MEC03	Using a character builder or a template to plan out your character's advancement at an early level.
	MEC04	Knowing as much about the game mechanics and rules as possible.
Competition	COM01	Competing with other players.
	COM02	Provoking or irritating other players.
	COM03	Dominating/killing other players.
	COM04	Doing things that annoy other players.
Socializing	SOC01	Getting to know other players.

	SOC02	Helping other players.
	SOC03	Chatting with other players.
	SOC04	Being part of a friendly, casual guild.
Relationship	REL01	Having meaningful conversations with other players.
	REL02	Talking to your friend players about your personal issues.
	REL03	Having your friend players offered you support when you had a real life problem.
Teamwork	TEA01	Grouping with other players.
	TEA02	Soloing well your character.
	TEA03	Working with others in a group.
	TEA04	Having a self-sufficient character.
Discovery	DIS01	Exploring the world just for the sake of exploring it.
	DIS02	Finding quests, Non-Player-Controlled Character (NPCs) or locations that most people do not know about.
	DIS03	Collecting distinctive objects or clothing that has no functional value in the game.
	DIS04	Exploring every map or zone in the world.
Role-Playing	ROP01	Trying out new roles and personalities with your characters
	ROP02	Being immersed in a fantasy world.
	ROP03	Making up stories and histories for your characters.
	ROP04	Role-playing your character.
Customization	CUS01	Customizing your character during character creation.
	CUS02	Matching character's armor/outfit in color and style.
	CUS03	Differentiating your character looks from other characters.
Escapism	ESC01	Avoiding thoughts of your real-life problems or worries.
	ESC02	Relaxing from the day's work/study.
	ESC03	Escaping from the real world.
How do you feel about your overall experience of playing WoW [Bhattacharjee, 2001]:		
Enjoyment	POE01	Playing WoW is enjoyable.
	POE02	Playing WoW is pleasurable.
	POE03	Playing WoW is fun.
	POE04	Playing WoW is exciting.

	POE05	Playing WoW is interesting.
Confirmation	CON01	My experience with playing WoW was better than what I expected.
	CON02	The enjoyment provided by playing WoW was better than what I expected.
	CON03	Overall, most of my expectations from playing WoW were confirmed.
Satisfaction	SAT01	Very dissatisfied/Very satisfied
	SAT02	Very displeased/Very pleased
	SAT03	Very frustrated/Very contented
	SAT04	Absolutely terrible/Absolutely delighted
Continuance Intention to play	CIP01	I intend to continue playing WoW rather than discontinue its use.
	CIP02	My intentions are to continue playing WoW than play any alternatives.
	CIP03	If I could, I would like to continue playing WoW.

Table 1. Construct and Item

5. MODEL ESTIMATION

We analyzed the research model with partial least square (PLS) approach, a structural equation modeling (SEM) technique that is well suited for highly complex predictive models. PLS offers less restriction on variable distributions. It also provides a better explanation for complex relationship [Fornell & Larcker, 1981] and is widely adopted by IS researchers [Chin, 1998]. Employing the two-step analytical procedures [Hair, Black, Babin, Anderson, & Tatham, 2006], the psychometric assessment of the measurement model was first conducted, followed by the testing of structural model.

5.1. Measurement Model

Convergent validity. Convergent validity indicates the extent to which the items of a scale that are theoretically related to each other should be related in reality. It was examined by use of the composite reliability (CR) and the average variance extracted (AVE). The critical values for CR and AVE are 0.70 and 0.50 respectively [Fornell & Larcker, 1981]. As summarized in Table 2, all CR and AVE values meet the recommended levels, with the CR ranging from 0.77 to 0.94 and the AVE ranging from 0.60 to 0.79. Item loadings lower than 0.70 were dropped from subsequent analysis.

Discriminant validity. Discriminant validity is the extent to which the measurement is not a reflection of some other variables. It is indicated by low correlations between the measure of interest and the measure of other constructs [Fornell & Larcker, 1981]. Evidence of discriminant validity can be demonstrated when the squared root of the AVE for each construct is higher than the correlations between it and all other constructs. As shown in Table 3, the square root of AVE for each construct is greater than the correlations between it and all other constructs. The results suggested an adequate discriminant validity of all measurements.

Construct	Item	Mean	S.D.	Loading	t-value	CR	AVE
Advancement	ADV02	6.18	0.89	0.76	28.53	0.86	0.60
	ADV03	6.28	0.80	0.82	34.43		
	ADV04	6.20	0.80	0.73	22.25		
Mechanics	MEC01	5.52	1.15	0.80	34.09	0.87	0.63
	MEC02	5.77	1.03	0.80	27.30		
	MEC03	5.72	1.05	0.83	42.38		
	MEC04	5.67	1.09	0.74	19.03		
Competition	COM01	5.72	1.11	0.71	24.29	0.89	0.67
	COM02	3.91	1.84	0.87	36.53		
	COM03	4.25	1.80	0.86	36.09		
	COM04	3.62	1.88	0.81	26.73		
Socializing	SOC01	5.63	1.03	0.85	45.87	0.91	0.71
	SOC02	5.40	1.11	0.88	60.06		
	SOC03	5.56	1.14	0.88	68.22		
	SOC04	5.80	0.96	0.77	28.40		
Relationship	REL01	5.74	1.04	0.75	36.09	0.84	0.64
	REL02	4.72	1.57	0.81	30.46		
	REL03	5.08	1.38	0.82	34.68		
Teamwork	TEA01	5.89	0.89	0.90	93.70	0.88	0.79
	TEA03	5.82	0.95	0.88	60.30		
Discovery	DIS02	5.54	1.05	0.79	30.15	0.94	0.64
	DIS03	5.41	1.32	0.80	30.98		
	DIS04	5.69	1.04	0.82	29.06		
Role-Playing	ROP01	5.76	1.00	0.76	30.74	0.85	0.66

	ROP03	5.60	1.06	0.85	48.49		
	ROP04	5.64	1.12	0.82	29.59		
Customization	CUS01	5.74	0.98	0.79	37.00	0.86	0.67
	CUS02	5.58	1.05	0.83	37.81		
	CUS03	5.65	1.06	0.83	44.88		
Escapism	ESC01	5.03	1.38	0.78	27.05	0.77	0.62
	ESC02	6.06	0.91	0.80	27.70		
Enjoyment	POE01	6.11	0.81	0.86	49.82	0.92	0.70
	POE02	6.08	0.84	0.84	49.82		
	POE03	6.02	0.88	0.84	49.67		
	POE04	6.05	0.86	0.82	45.92		
	POE05	6.12	0.79	0.82	42.91		
Confirmation	CON01	5.79	0.91	0.86	54.85	0.89	0.73
	CON02	5.84	0.89	0.86	53.07		
	CON03	5.87	0.83	0.84	35.19		
Satisfaction	SAT01	5.98	0.78	0.87	50.45	0.91	0.72
	SAT02	6.09	0.80	0.84	51.33		
	SAT03	5.92	0.84	0.85	55.54		
	SAT04	6.06	0.82	0.84	52.52		
Continuance Intention to Play MMOGs	CIP01	5.99	0.92	0.87	61.41	0.91	0.78
	CIP02	5.92	0.97	0.87	64.43		
	CIP03	6.10	0.85	0.90	85.90		
<i>Notes: CR = Composite Reliability, AVE = Average Variance Extracted</i>							

Table 2. Psychometric Properties of Measures

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.77													
2	0.11	0.82												
3	0.45	0.30	0.88											
4	0.45	0.39	0.53	0.82										
5	0.40	0.36	0.45	0.62	0.80									
6	0.33	0.37	0.43	0.53	0.49	0.79								

7	0.53	0.23	0.63	0.53	0.41	0.44	0.88							
8	0.50	0.40	0.57	0.60	0.57	0.50	0.52	0.79						
9	0.56	0.15	0.62	0.50	0.40	0.47	0.73	0.51	0.84					
10	0.21	0.44	0.42	0.50	0.52	0.46	0.34	0.49	0.31	0.80				
11	0.49	0.39	0.53	0.72	0.66	0.61	0.53	0.63	0.57	0.51	0.81			
12	0.50	0.28	0.76	0.54	0.43	0.45	0.68	0.59	0.70	0.38	0.56	0.85		
13	0.39	0.38	0.59	0.61	0.57	0.51	0.52	0.60	0.45	0.82	0.65	0.54	0.85	
14	0.42	0.22	0.53	0.52	0.41	0.36	0.55	0.52	0.48	0.50	0.51	0.50	0.78	0.89

1 = Advancement; 2 = Competition; 3 = Confirmation; 4 = Customization; 5 = Discovery; 6 = Escapism; 7 = Continuance intention to play MMOGs; 8 = Mechanics; 9 = Enjoyment; 10 = Relationship; 11 = Role-playing; 12 = Satisfaction; 13 = Socializing; 14 = Teamwork

Notes: Items on the diagonal represent the square root of AVE

Table 3. Correlation Matrix

5.2. Structural Model

The sample was bootstrapped with 5000 random samples to test the significant level of the path coefficients. The obtained path coefficients and their levels of significance supported all hypotheses, with exception of H6b. Figure 2 presents the PLS results of the model.

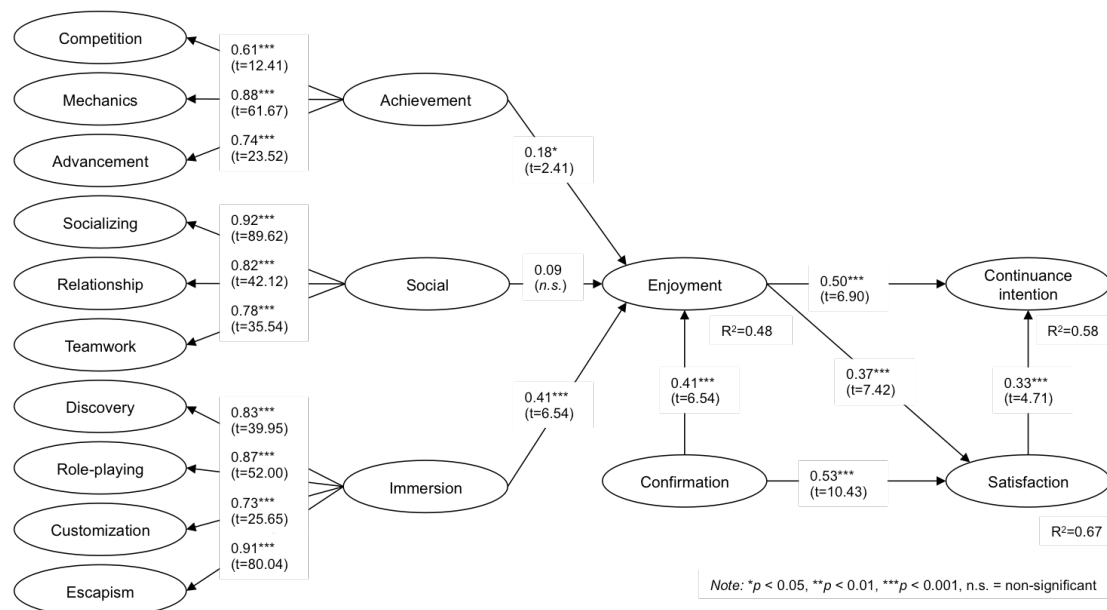


Figure 2. PLS Results of the Structural Model

Overall, the majority of the proposed hypotheses are significant, and the model explains a substantial amount of variance in the continuance intentions to play MMOGs. The model

explains 48% of the variance in enjoyment, 67% of the variance in satisfaction and 58% of the variance in the continuance intention to play MMOGs. Enjoyment and satisfaction are significant predictors to gamers' continuance intention to play MMOGs.

6. DISCUSSION

6.1. Results

This paper sought to explore the continuance intention to play MMOGs, a post-adoption behavior in hedonic IS use. The current model extends the IS continuance model [Bhattacharjee, 2001] by incorporating with the motivations of playing MMOGs [Yee, 2006]. Results of study are strongly supportive to the extended IS continuance model, with the majority of the hypotheses being corroborated. Enjoyment ($\beta = 0.50, p < 0.001$) and satisfaction ($\beta = 0.33, p < 0.001$) are significant determinants of gamers' continuance intention to play MMOGs, while confirmation is significant predictor of both enjoyment ($\beta = 0.41, p < 0.001$) and satisfaction ($\beta = 0.53, p < 0.001$). In addition, the salience of enjoyment is much stronger than satisfaction in predicting the continuance intention. Enjoyment is suggested to be a significant predictor for hedonic IS use. The current results highlight the importance of enjoyable gaming experience in retaining gamers.

In addition, the results also reveal strong relationships between motivations of playing MMOGs and enjoyment. As expected, achievement ($\beta = 0.18, p < 0.05$) and immersion ($\beta = 0.27, p < 0.001$) are positively related to enjoyment. To our surprise, social motivation has no significant relationship with enjoyment. This can be attributed to the background setting of our selected MMOGs, WoW. WoW encourages competitions for resources among gamers. At the beginning of the game, gamers must choose between the opposing factions of the Alliance or the Horde. Gamers strive for advancement, play for honor and gain glory for their faction. Most of the time, competitions with other gamers are inevitable. These kinds of settings promote in-game advancement and competition, which is different from other MMOGs emphasizing more on social interactions between gamers. Although gamers may group together for certain quests or challenges, their initial goals are always about the completion of quests, instead of developing long-term and sustainable relationships. They dismiss the group when the task is completed. Thus, this kind of improvisational grouping might not able to foster social interaction and relationship building in WoW.

6.2. Theoretical Implications

The current study contributes to existing hedonic IS research in several ways. Our findings confirmed that the IS continuance model applies to the underexplored hedonic IS context, MMOGs. The extended IS continuance model provides empirical evidence to the generalizability of IS continuance model from utilitarian information systems to hedonic innovations. Moreover, our result reveals that the inclusion of motivations to play MMOGs provides a more comprehensive mechanism to understand the continuance intention in MMOGs. Our study also responds to the call from Benbasat and Zmud [2003] regarding the call for examining context specific variables in information systems research. The current study demonstrates the incorporation of MMOGs motivations and enriches our understanding of gamers' continuance intention to play MMOGs. To conclude, additional knowledge is injected to the limited research available about MMOG continuance.

6.3. Practical Implications

It is expected that the findings should be beneficial to game developers by providing insights into future MMOG development. The success of MMOGs not only counts on how many gamers are attracted at the initial stage, but also how many are retained after the trial. By introducing gamer-desired updates, gamers would derive more enjoyment and stick with the game. Game developers should pay more attention to developing achievement and immersion related updates.

6.4. Limitations

This study acknowledges several limitations. First, our research model employed in this study focuses only on the user side, the research model accounts for 58 percent of the variance in the continuance intention to play MMOGs, suggesting that certain aspect of predictors might have been omitted, such service quality variables from the service provider side (e.g., server quality, network stability) and social influences (e.g., social norms, social presence). Future studies may attempt to investigate gamers' continuance intention by incorporating the aforementioned variables to yield a more comprehensive picture. Apart from the user focus, our respondents were the gamers of WoW. The sample represents only a specific group of gamers in MMOGs. Future study can investigate other MMOGs or extend to other hedonic IS contexts.

7. CONCLUSION

The current study introduced an extended IS continuance model with the inclusion of motivations of playing MMOGs. Empirical test of the conceptual model revealed that most of the hypotheses are significantly supported, suggesting that the IS continuance model is capable of extending to the context of hedonic IS. With the incorporation of motivations to play MMOGs, gamers' continuance intention is better understood. Our study sheds light on the possibility in extending the IS continuance model, and that future studies are encouraged to take into account additional perspectives of MMOGs to examine gamers' post-adoption behaviors thoroughly.

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