Computers in Human Behavior 27 (2011) 2372–2379

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Mediating roles of self-presentation desire in online game community commitment and trust behavior of Massive Multiplayer Online Role-Playing Games

Seung-bae Park [a], Namho Chung [b,*]

[a] School of Business Administration, Sungkyunkwan University, 53 Meongnyun-Dong 3-Ga, Jongno-Gu, Seoul 110-745, Republic of Korea
[b] College of Hotel & Tourism Management, Kyung Hee University, 1 Hoegi-dong, Dongdaemun-gu, Seoul 130-701, Republic of Korea

ARTICLE INFO

Article history:
Available online 9 August 2011

Keywords:
Self-presentation desire
Design quality
Interactivity
Personal innovativeness
Trust
Community commitment

ABSTRACT

Massive Multiplayer Online Role-Playing Games (MMORPGs), which allow simultaneous participation of several gamers, have attracted a great deal of attention recently. Since MMORPGs can be categorized as a type of online community, the behavior of MMORPGs users needs to be considered as the general behavior in online communities. However, previous studies of online communities did not pay enough attention to MMORPGs, in which users can express themselves by interacting actively through games and game avatars. Understanding the characteristics of MMORPGs as online game communities where users communicate and interact will allow games to be vitalized and users to be immersed in games in a more positive way. Hence, using self-presentation theory and social identity theory, this study examined the factors influencing self-presentation desire and the mediating role of self-presentation desire examined in terms of trust of and commitments to online game communities. The results showed that the interactivity in the spaces of MMORPGs had the biggest impacts on self-presentation desire; personal innovativeness and game design quality also was influential. The results also indicated that self-presentation desire caused trust of online games and eventually led to even stronger commitments to gamers.

1. Introduction

The advances in the internet and computer networks enable people to communicate without the constraints of physical space and time. Generally speaking, people have a continuous interest in self-images, and they expect to build images in self-satisfying or socially desirable ways (Leary & Kowalski, 1990). These expectations also apply to online spaces; people expect others to see themselves as the images they want in online activities, and thus invest time, costs, and effort to form positive online images (Schau & Gilly, 2003). Superficially, self-presentation on the internet are tools people use to express themselves, but ultimately, they are also symbolic self-identification subjects. For example, people tend to symbolically identify themselves with avatars, which basically are for self-presentation (Mitchell, 1999). For this reason, online users try to make their avatars exhibit the images they desire by dressing their avatars in clothes and accessories as if they were adorning themselves. In addition, people tend to compare themselves socially with others to judge their abilities. They may compare their "mini-hompies" (mini-homepages) with those of others and try to express themselves in a different way using mini-hompy skins, background music, or other digital items. Such self-presentation desire in online spaces is a key driver that induces commitments to online communities or instills trust in online games (Bauer, Grether, & Leach, 2002; Brignall & Valey, 2007). Massive Multiplayer Online Role-Playing Games (MMORPGs), which allow simultaneous participation of several gamers, have attracted a great deal of attention recently. MMORPGs are characterized by their enabling of easy self-presentation in online spaces. Moreover, users cannot only entertain themselves playing games but also interact socially and be involved in monetary exchange activities. The cyberspaces of MMORPGs, where all relevant activities take place, endure continuously regardless of users' login status, and there are no constraints on changing the gender, age, or appearance of game participants (Yee, 2006). In other words, users can choose the spaces as they want, generate any activities or events they want, and form a story in which they play the main roles of the game characters. In short, avatars, as characters of MMORPGs, offer enjoyment and fulfill self-presentation desire at the same time.

However, most previous studies did not consider MMORPGs as a type of online community where self-presentation and interactivity take place using the game as a communication tool, but rather as one of many types of online games. Considering the characteristic of MMORPGs as enabling multilateral social activities, the behavior of game users needs to be examined in relation to that of online community users in general.

* Corresponding author. Tel.: +82 2 961 2353; fax: +82 2 964 2537.
E-mail addresses: sbpark@skku.edu (S.-b. Park), nhchung@khu.ac.kr (N. Chung).

0747-5632/$ - see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.chb.2011.07.016

People are willing to be involved in MMORPGs because they believe the games offer common values to individuals, "guilds," and "clans." Playing games provides their players with many benefits—fun, which is a direct reward—and self-contentment and fame, which are a reward for self-presentation, and other benefits such as sharing information about the games or participating in relevant game communities (Hall & Graham, 2004). With respect to these benefits, the most important component of MMORGP is a "guild," where users generate social values by interacting with others (Kang, Ko, & Ko, 2009).

Users will be more actively involved in expressing themselves when MMORPGs are designed to display the above benefits and to allow smoother interactivity as if users were not innovative enough already (Dominick, 1999; Schau & Gilly, 2003). Those who express themselves actively in MMORPGs are likely to trust online games and be immersed in online game communities such as guilds.

To this end, this study suggests the following objectives based on self-presentation theory (Leary, 1995; Schlenker, 1975) and social identity theory (Ashforth & Mael, 1989; Tajfel & Turner, 1979). First, factors influencing self-presentation desire will be examined. Second, the mediating role of self-presentation desire will be examined in terms of trust of and commitments to online game communities. In addition, theoretical interpretations of the results and practical implications of MMORPGs providers will be suggested.

The rest of the paper is organized as follows: Section 2 presents the theoretical background. Section 3 describes the research model and hypotheses. Section 4 presents the research methodology, and Section 5 describes the analysis and findings of our research. Section 6 shows the discussion and concludes with limitations and suggestions for further research.

2. Theoretical backgrounds

This study is based on social identity theory (Tajfel & Turner, 1979) and self-presentation theory (Leary, 1995). Social identity theory is concerned with self-concept-ideas and images of oneself. Studies on self-concept report that it is composed of real self, ideal self, social self, and ideal social self; consumer consumption attempts to realize the ideal self (Sirgy, 1982). Self-presentation includes performing certain roles while exposing self to others (Trammell & Keshelaslwli, 2005). It is a process where people control and manage information for the purpose of delivering certain self-images to others continuously (Ellison, Heino, & Gibbs, 2006; Leary & Kowalski, 1990). In other words, self-presentation involves expressing self-image.

People tend to have attachments to those who receive their self-images, which are thus expressed effectively (Onkvisit & Shaw, 1987). Having a psychological linkage or emotional attachment toward specific others is called identification in social psychology. The emotional attachment to specific others is caused by the combination of personal identity and social identity (Long & Schiffman, 2000; Underwood, Edward, & Robert, 2001). Personal identity is generated when people discover similarities in others by reflecting a built self-consciousness. Therefore, people invest time, money, and effort to build a positive online image, expecting others to see them as the images they present (Schau & Gilly, 2003). Dressing avatars in clothes and accessories is one example of presenting self-identity. On the other hand, social identity is generated when people identify themselves with members of groups they belong to, symbolically reflecting self-consciousness, which is built by evaluating themselves and interacting with others through social comparison with others. For example, people may compare their own minihompies with those of others who express their online images better or seem to have a similar lifestyle, and form *Ilchon* (friendship) with them. People tend to behave in accordance with their own identity. Moreover, they support groups that can assist them in actualizing the identity. The sense of unity in a specific group increases according to the following factors: when the satisfaction of the group is high, distinctions between groups are many, the images and reputation of the group are favorable, interactivity within the group is positive, and the similarity and homogeneity level is high (Bhattacharya, Rao, & Glynn, 1995; Lau, 1989; Mael & Ashforth, 1992). In addition, the sense of unity that is formed within a group promotes financial commitments to the group, teamwork among the members, and reduces the rate of member transfers to other groups (Mael & Ashforth, 1992; O'Reilly and Chatman, 1986; Shamir, 1990). MMORPGs also allow people to express their self-identity through self-presentation. In addition, the identification that is built in guilds or clans generates a psychological attachment that resembles a sense of belonging and promotes commitments to the guilds or clans.

3. Research model and hypotheses

Self-presentation on the web is accomplished by a user interface, which is a communication tool and helps build a self-fulfilling presentation. Web design can promote more commitments to group web sites by enhancing rapid reaction and controls (Hoffman & Novak, 1996; Novak, Hoffman, & Yung, 2000), which may both influence the evaluation of individualized contents expressing self and serve as a foundation of active interactivity among individuals. MMORPGs, particularly, allow users to be immersed in the games since they offer spaces where many users can gather and similarities to the real in order to increase self-presentation. Moreover, online game characters like avatars enable users to reproduce new visual images and interact with others using them. These game characters include avatars that carry unique emotional images, which can serve as a self-presentation tool. Therefore, self-presentation desire may increase as the game design becomes more favorable-that is, the user interface or characters of the games are associated with users' identity.

Hypothesis 1. Online game design quality has a positive effect on the self-presentation desire of online identity.

Self-presentation involves expressing one's identity to others (Kim & Chan, 2007; Leary, 1995). Controls, mutual communication, reactivity, participation, and interactivity are essential to express one's identity in online spaces (Chen & Yen, 2004; Lee, Lee, & Yoo, 2005; Liu & Shurm, 2002; McMillan & Hwang, 2002). In other words, since self-presentation includes all goal-oriented behaviors that seek positive evaluation from others and avoid criticism from others (Baumeister, 1998; Leary & Kowalski, 1990; Schlenker, 1980), the characteristics of interactivity-simultaneity, controls, reactivity, and participation should be reflected to enable such goal-oriented behaviors. People use many types of resources to exhibit themselves in images that they want other people to see them as (Dominick, 1999; Schau & Gilly, 2003). Since such images are consistent and maintained by selectively and deliberately (Schlenker, 1975; Schneider, 1981), people try harder to improve self-presentation when they place a premium on social interactivity (Leary & Kowalski, 1990). For example, interaction frequency, activity diversity, and relational influence are required for close relation between users and avatars (Zhao, Wang, & Zhu, 2010).

Hypothesis 2. Interactivity has a positive effect on the self-presentation desire of online identity.

Personal innovativeness is a tendency to accept innovation relatively rapidly compared to other members in a social system (Rogers, 2003). Such personal innovativeness, which is an innate trait, influences various behaviors of consumers such as decisions on a new product and open attitudes toward new experiences and stimulation (Midgley & Dowling, 1978).

As information explorers who seek for information on new ideas actively, innovative consumers accept risk and uncertainty in a positive way (Rogers, 2003). In addition, consumers with higher levels of innovativeness tend to have more interest in style than in practicality (Goldsmith & Flynn, 1992) and pursue benefits from new experiences (Kim & Kang, 2005). In the case of MMORPGs, their contents rarely repeat, and it takes a considerably long time to become accustomed to them. In addition, innovative users tend to maintain positive online images that are formed by physical possession (Belk, 1988) and pursue benefits from new experiences when choosing new products or technologies (Kim & Kang, 2005). People with high innovativeness may possess and take advantage of digital items because such items play a significant role in self-presentation (Ziamou & Ratneshwar, 2003). Therefore, people with higher innovativeness may have stronger motivation to present and promote their images.

Hypothesis 3. Personal innovativeness has a positive effect on the self-presentation of online identity.

In MMORPGs, there are special communities such as guilds or clans for interactivity among users (Ye & Chen, 2006). When users play MMORPGs, the activities are not independent, but are connected with those of others, and the activities and social relations created in games remain the same until the next play (Ye & Chen, 2006). In the internet environment, when an individual is given a symbolic identity, a counterpart who shares it and communicates with the individual is necessary; therefore, editing or reproduction of the counterpart may be required. In other words, the elements of self-presentation that the internet environment provides reflect symbolic identity and are based on communication with others. In particular, unique community senses are composed of membership, a sense of sharing, emotional association, desire fulfillment, and flow experience (Armstrong & Hagel, 1996; Muniz & O'Guinn, 2001). Members who encounter their usefulness through community managing activities are more influenced by the community senses-belonging, influence, and emotional association-which have positive effects on the commitments to the online community. In other words, when users find an online community that is useful to express themselves, a sense of sharing, standards and tradition, and a sense of responsibility can be created, which may lead to commitments to online games. MMORPGs offer guild chatting services and guild messenger services to promote active involvement in guild activities (Brignall & Valey, 2007). Such active participation through interactivity among members may increase commitments to online communities based on both standards and traditions and a sense of sharing and responsibility.

Hypothesis 4. Self-presentation desire of online identity has a positive effect on the commitment to an online game community.

Interpersonal skills enable people to both interact with others in consideration of others' situations and handle problems than can bring negative results in social relations (Rubin, Cathryn, & Rosemary, 1995). An increase of self-presentation through playing games may enhance one's autonomy and interactivity with others. For example, physical education classes can offer enjoyable opportunities to experience competition and improve peer relations, self-esteem, and self-value through social comparison (Roberts & Treasure, 1992). In addition, symbolic consumption induced by the motivations of self-enhancement and maintenance of self-esteem is interpreted as an activity to both express one's values and adapt to society (Shavitt, 1990). Therefore, by displaying self-concepts effectively, successful self-presentation engages consumer preferences and grater emotional fellowship and trust (Sirgy, 1982).

Hypothesis 5. Self-presentation desire of online identity has a positive effect on the trust of online games.

Trust is a key element in building a close relationship (Berry, 1995; Moorman, Zaltman, & Deshpand, 1992; Morgan & Hunt, 1994). Trust is assured goodwill in an exchange relationship (Moorman et al., 1992), and a confident perception of the reliability and honesty of the exchange partner (Morgan & Hunt, 1994). Therefore, confidence and reliability are very significant in the concept "trust." In other words, trust is confidence in the reliability and honesty of partners (Garbarino & Johnson, 1999).

Trust is an essential element in maintaining relationships of consumers and their partners and has positive effects on commitments (Bauer et al., 2002; Morgan & Hunt, 1994; Moorman et al., 1992). Trust in relationships plays the role of encouraging service providers to pursue reliable behavior, which maximizes the rewards (Macneil, 1980). Moreover, once trust is built, a long-term relation between a service provider and a user instead of pursuing opportunist behavior, which means trust influences commitments. In other words, higher trust will bring higher commitments between parties in one relation. This applies to MMORPGs; trust of

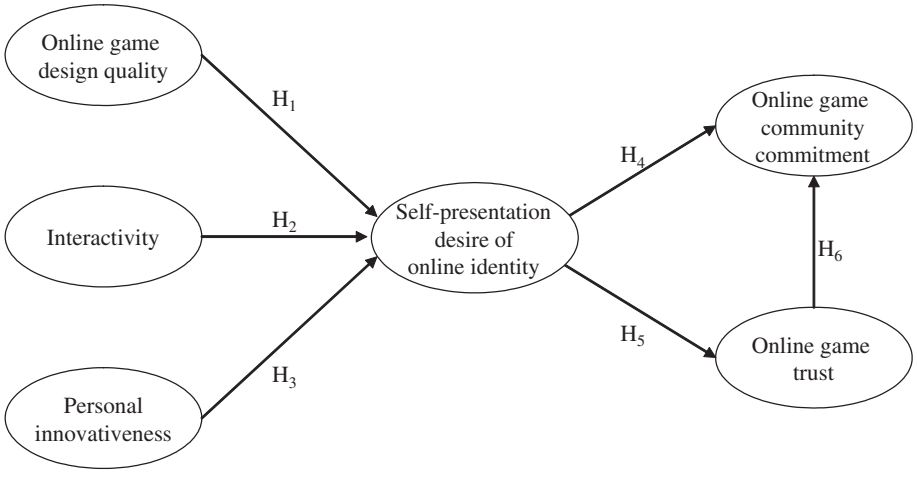

Fig. 1. Research model.

the game spaces and other gamers will bring higher commitments to the games. Therefore, a hypothesis as follows can be built.

Hypothesis 6. Online game trust has a positive effect on the commitments to an online game community.

The hypotheses can be summarized as shown in Fig. 1. This model expects that higher self-presentation desire and trust of online games will bring higher commitments of online community members to the communities. In addition, it suggests that commitments to an online community increase when a sense of unity is formed. Users encounter many types of experience through design and interactivity that fulfill their self-presentation desire, as reported by studies of Muniz and O'Guinn (2001) and Kim, Han, and Park (2001).

Table 1
Descriptive statistics of user groups.

Demographics		n = 340	%
Gender	Male	306	90
	Female	34	10
Age	Less than 20	34	10
	20–less than 30	292	85.9
	More than 30	14	4.1
Education: level completed	High school	19	5.6
	(2 years) College	283	83.2
	Bachelor's degree	37	10.9
	Master's degree	1	0.3
Online game usage time (daily average)	Less than 30 min	26	7.6
	30 min–less than 1 h	97	28.5
	1 h–less than 2 h	132	38.8
	2 h–less than 3 h	48	14.1
	3 h–less than 4 h	15	4.4
	4 h–less than 5 h	17	5.0
	More than 5 h	5	1.5
Online game usage cost[a] (monthly average)	Less than 5000 Won	99	29.1
	5000 Won–less than 10,000 Won	45	13.2
	10,000 Won–less than 20,000 Won	30	8.8
	20,000 Won–less than 30,000 Won	46	13.5
	30,000 Won–less than 40,000 Won	16	4.7
	More than 40,000 Won	9	2.6
	Non-response	95	27.9

[a] 1 $ (USD) = 1100 Won.

4. Research methodology

4.1. Data collection

To verify the model and hypotheses derived previously, relevant data was collected through an online survey using a questionnaire on variables. This study conducted a preliminary research on the characteristics of online gamers' attitudes toward online game communities through an offline focus group interview and then, based on the results of the preliminary research, carried out the main research online. The questionnaire was composed in the form of a web page. The survey was advertised using web banners on the first pages of online game websites and hyperlinks on several college websites. The respondents were asked to select their favorite MMORPGs among Maple Story, Linegy, Legend of Mir, Mu, the Land of the Wind, World of Warcraft, Wow, Dungeon and Fighter, Talesweaver, and Ion. They were also asked to answer the questions regarding game design quality, interactivity, commitments to game communities, trust, innovativeness, and self-presentation desire.

A total of 340 respondents participated. The characteristics of the respondents are as follows in Table 1. The sample consists of more males (90%) than females (10%), most (85.9%) are between the ages of 20 and 29, and the majority have a university or lower level of education (94.1%), implying that people with lower education are more likely to use online game. The highest online game usage time per day is 1 h ~ less than 2 h (38.8%), followed by 2 h ~ less than 3 h (14.1%). Finally, the highest online game usage cost per month is 20,000 Won ~ less than 30,000 Won (13.5%), followed by 5000 Won ~ less than 10,000 Won (13.2%).

Table 2
Measurement model resulting from confirmatory factor analysis.[a]

Constructs and variables	Standardized factor loadings	CCR[b]	AVE[c]
Community commitment		0.933	0.823
I have a sense of belonging toward the online game communities	0.948		
I have emotional attachment to other members of the online game communities	0.908		
I participate in the online game communities enthusiastically	0.863		
Trust		0.826	0.622
I think this online game can offer fun to me when I need it	0.587		
This online game is reliable	0.946		
This online game is honest	0.790		
Self-presentation desire of online identity		0.802	0.579
I want to enhance my online image in this online game	0.707		
I want to establish an online image for myself in this online game	0.921		
I think this online game is essential to express myself	0.659		
Design quality		0.769	0.535
I am allowed to select the avatars (characters) of this online game according to my taste	0.518		
I am allowed to select the background images of this online game according to my taste	0.855		
I am allowed to select the sounds of this online game according to my taste	0.779		
I think the character graphics of this online game are great[d]	–		
Interactivity		0.831	0.624
I exchange opinions on common interests with other gamers through this online game	0.703		
I have attachment to other gamers who participate in this online game community or guild	0.875		
I think the gamers who participate in this online game community or guild help one another	0.782		
Personal innovativeness		0.816	0.600
If I heard about a new online game, I would look for ways to experiment with it	0.669		
Among my peers, I am usually the first to try out new online game	0.911		
In general, I am hesitant to try out new online game	0.723		
I like to experiment with new online game[d]	-		

[a] χ^2 = 295.470, df = 120 (χ^2/df = 2.462), p = 0.000, GFI = 0.912, AGFI = 0.875, RMSEA = 0.066, NFI = 0.910, CFI = 0.944.
[b] Composite construct reliability.
[c] Average variance extracted.
[d] The item was deleted after confirmatory factor analysis.

Table 3
Construct intercorrelations, mean, and standard deviation.

	1	2	3	4	5	Mean	SD
1. Community commitment	1					3.736	1.234
2. Trust	0.194**	1				4.230	1.367
3. Self presentation	0.429**	0.210**	1			3.689	1.347
4. Design quality	0.317**	0.128**	0.329**	1		3.329	1.420
5. Interactivity	0.439**	0.321**	0.393**	0.302**	1	3.075	1.554
6. Personal innovativeness	0.395**	0.051	0.376**	0.381**	0.282**	4.512	1.084

** $p < 0.01$.

4.2. Instrument development

The instruments in this study are based on previous studies and reworded to suit the context of MMORPGs (see Table 2) (Kim & Chan, 2007). The scale items are measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The original English-language questionnaire was administered in Korean. To avoid cross-cultural methodology issues, back-translation (with the material translated from English into Korean and then back into English, the versions compared, and discrepancies resolved) is used to ensure consistency between the survey versions (Mullen, 1995; Singh, 1995).

Online game design quality is measured by four items adopted from Brakus, Schmitt, & Zarantonello (2009) and Zarantonello, Schmitt, & Brakus (2007). The coefficient alpha is 0.750. Interactivity is measured using a scale of three items revised from Liu and Shurm (2002), McMillan and Hwang (2002) and Chen and Yen (2004). The coefficient alpha is 0.827. Personal innovativeness is measured using a four item scale adopted from Rogers (2003) and Goldsmith and Flynn (1992). The coefficient alpha is 0.808.

Self-presentation desire is measured by a three-item scale based on Dominick (1999) and Jung, Youn, and McClung (2007). The coefficient alpha is 0.789. Trust is measured using three items based on Chaudruri and Holbrook (2001), Moorman et al. (1992), and Morgan and Hunt (1994). The coefficient alpha is 0.810. Finally, three community commitment items are adopted from Garbarino and Johnson (1999) and Gruen, Summers, and Acito (2000) with a coefficient alpha of 0.931.

5. Analysis and results

For the analysis of statistics, AMOS 18, a maximum likelihood-based structural equation modeling (SEM) software, was used. AMOS is a covariance-based approach, in which the covariance structure, derived from the observed data, is used to simultaneously fit the measurement and structural equations specified in the model.

5.1. Measurement model

Self-reported data on two or more variables collected from the same source has the potential to lead to common method variance. Therefore, Harman's single-factor test is used to test for such bias (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). It assumes that if a high level of common method variance is present, then when all of the variables are entered together they will load on one factor accounting for a majority of the variance. In this study, an exploratory factor analysis results in eight factors with eigenvalues greater than one, with the first factor accounting for 11.632% of the variance in the items. The results did not indicate a single factor structure accounts for most of the variances, suggesting that common method bias is not a concern in the data.

Overall measurement quality is assessed using confirmatory factor analysis (Anderson & Gerbing, 1992). Although measurement quality is sometimes assessed factor by factor, in the current study each multiple-item indicator is considered simultaneously to provide for the fullest test of convergent and discriminant validity. As shown in Table 2, two items with low factor loadings (below 0.50) are dropped from further analysis (Anderson & Gerbing, 1992; Babin & Boles, 1998).

All loadings exceed 0.50, and each indicator t-value exceeds 11.028 ($p < 0.001$). The χ^2 fit statistics show 295.470 with 120° of freedom ($\chi^2/df = 2.462$) ($p < 0.001$). The root mean square error of approximation (RMSEA) is 0.066; the comparative fit index (CFI) is 0.944; the adjusted goodness-of-fit index (AGFI) is 0.875; and the normed fit index (NFI) is 0.910. All statistics support the overall measurement quality given the number of indicators (Anderson & Gerbing, 1992).

Furthermore, evidence of discriminant validity exists when the proportion of variance extracted in each construct exceeds the square of the Φ coefficients representing its correlation with other factors (Fornell & Larcker, 1981). One pair of scales with a high correlation between them is interactivity and community commitment ($\Phi = 0.439$, $\Phi^2 = 0.192$) (see Table 3). The variance extracted estimates are 0.624 and 0.823, indicating adequate discriminant validity. To allay concern about the discriminant validity of self-presentation and community commitment, the correlation between self-presentation and community commitment is 0.429 ($\Phi^2 = 0.184$). The variance extracted estimates for these scales are 0.579 and 0.823, respectively. Thus, according to this assessment, the measures appear to have acceptable levels of validity.

5.2. Overall model results

Table 4 presents the maximum-likelihood estimates for the various overall fit parameters. The χ^2 statistic suggests that the data do not fit the model ($\chi^2 = 364.711$, $df = 126$, $p < 0.000$). However,

Table 4
Analysis of structural model.

Hypotheses	Path	Estimates (t-value)
H_1	Game design quality → self presentation	0.202 (3.018)
H_2	Interactivity → self presentation	0.322 (5.020)
H_3	Personal innovativeness → self presentation	0.283 (4.237)
H_4	Self-presentation → community commitment	0.490 (7.693)
H_5	Self-presentation → trust	0.257 (4.055)
H_6	Trust → community commitment	0.100 (1.851)
	R^2	
	Self presentation	0.378
	Trust	0.066
	Community Commitment	0.276

$\chi^2 = 364.711$, $df = 126$, $p = 0.000$, GFI = 0.893, AGFI = 0.855, RMSEA = 0.075, NFI = 0.889, CFI = 0.924.

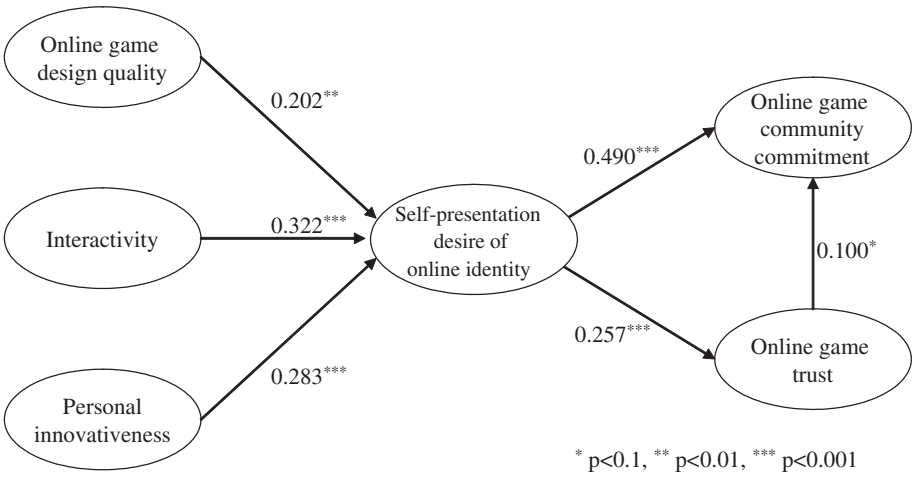

Fig. 2. Results of SEM analysis of the proposed model.

because of the sensitivity of the χ^2 statistic to sample size it is not always an appropriate measure of the goodness-of-fit of the model. Therefore, multiple fit indices assess the overall evaluation of fit (Bagozzi & Yi, 1988; Bollen, 1989; Hair, Black, Babin, Anderson, & Tatham, 2006). The goodness-of-fit index (GFI) is 0.893; the Bentler and Bonett (1980) normed fit index (NFI) is 0.889, respectively. Moreover, RMSEA is 0.075 and CFI is 0.924. These multiple indicators suggest that the model has good fit, justifying further interpretation.

The squared multiple correlations (SMCs; R^2) for the structural equations for self presentation, trust, and community commitment are high, as shown in Fig. 2. More than quarter of the variance (SMC = 0.276) in community commitment is explained by the direct effects of self-presentation and trust.

For trust (SMC = 0.066), an even lesser amount of the variance is explained by the direct effects of self presentation. For self-presentation (SMC = 0.378), the variance is explained by the direct effects of game design quality, interactivity and personal innovativeness. Table 4 presents the standardized parameter estimates.

Hypotheses H_1–H_3 address the structural relationships among design quality, interactivity, personal innovativeness and self presentation. Design quality has a positive effect on self-presentation ($\gamma_{11} = 0.202$, t-value = 3.018, $p < 0.01$), and is statistically significant at the $p < 0.01$ level, supporting H_1.

Also, H_2 is supported by the significant positive impact of interactivity on self-presentation ($\gamma_{12} = 0.322$, t-value = 5.020, $p < 0.001$). Personal innovativeness also has a positive impact on self-presentation ($\gamma_{13} = 0.283$, t-value = 4.237, $p < 0.01$), thus supporting H_3.

H_4 states that self-presentation is associated with online game community commitment. Self-presentation has a significant positive effect on community commitment ($\beta_{31} = 0.490$, t-value = 7.693, $p < 0.001$), so H_4 is supported as well.

H_5 is supported by a significant positive impact of self-presentation on trust ($\beta_{12} = 0.257$, t-value = 4.055, $p < 0.001$). Finally, trust is associated with community commitment ($\beta_{32} = 0.100$, t-value = 1.851, $p < 0.1$), supporting H_6.

6. Discussion and implication

There are several interesting findings in this study. In self-presentation in MMORPGs, interactivity plays a more crucial role than the design quality of games or personal innovativeness do. In other words, as games that enable better self-presentation satisfy gamers, interactivity rather than fancy design is required to satisfy gamers. This corresponds to the results of the study by Zhao et al. (2010). In addition, even gamers with personal innovativeness and challenging and adventurous spirit prefer games with high interactivity. Considering the argument in the study by Szmigin, Canning, and Reppel (2005) that bond concepts are very significant in online communities, interactivity serving as an essential element supports the hypothesis of this study that MMORPGs are not mere games but have the characteristics of online communities. Accordingly, this study suggests the importance of online game communities in online games and, furthermore, the significance of support for self-presentation environments (Kim & Chan, 2007).

This research offers several implications for theory and practice. From a theoretical perspective, this study highlighted online identity and self-presentation in MMORPGs. Online identity has been studied in other fields (Ashforth & Mael, 1989; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), and self-presentation has been applied to the online community field in a study (Kim & Chan, 2007). Nevertheless, this study examined the two elements in the online game field for the first time, which is one of the contributions this study made.

From a practical perspective, this study suggested specific ways to vitalize MMORPGs. Companies that operate MMORPGs will create high profits through an increase in intention to reuse and loyalty to games when many gamers participate in and are satisfied with the games (Kim & Chan, 2007). This study provides practical guidelines for the establishment of proper environments supporting gamers' self-presentation and the inducement of interactivity. In addition, as gamers' trust and commitment arise from self-presentation, it is very important to develop various items, characters, and avatars that help self-presentation in terms of the vitalization of games and creation of profits.

7. Conclusions

This study aimed to build a study model to explain the behavior of users in online game community spaces such as MMORPGs and verify it empirically. Like previous studies, this study proved that users of spaces like MMORPGs had high self-presentation desire, and made commitments to the spaces through this desire. In addition, the results showed that high game design quality and spaces enabling active interactivity were essential to increase the self-presentation desire of users. Moreover, people with higher personal innovativeness were proved to be more competent in self-presentation.

The study results indicate that MMORPGs are not simply games, but are online communities where people express themselves and communicate with others. Therefore, it is very important to design and plan games that allow users to interact more actively with others, which eventually will vitalize MMORPGs. Recently, prevalent social games such as Tweeter and Facebook have received attention. Crucial for such social games is the promotion of the self-presentation of users.

Aside from the implications mentioned previously regarding MMORPGs and social games, this study has a few limitations and suggestions for future studies. First, two online game websites and one online game community were used for the data collection, but most of the respondents were college students in their twenties, which disturbed the generalization of the results to all gamers. Therefore, some additional efforts need to be made for generalizing future study results.

Second, future studies need to consider parameters and moderating variables that are not examined in this study. The unique sensibility of online communities is composed of membership, a sense of sharing, emotional association, desire fulfillment, and flow experience (Armstrong & Hagel, 1996; Muniz & O'Guinn, 2001). In this respect, the moderating variables affecting social identification such as need for affiliation and group standards are thought to serve as parameters or moderating influences in the relation between self-presentation and commitments to online communities.

Third, additional studies on the characteristics of MMORPGs are required. Members of online communities who have a great deal of knowledge of MMORPGs are expected to serve as core opinion leaders in the communities. Interactivity between such opinion leaders and community members may directly influence participation in and commitments to online communities. In addition, the role of online communities is more crucial for the MMORPGs that require complex skills and strategies than those that can be played simply for fun. Therefore, studies that examine guilds and clans of MMORPGs considering the characteristics of MMORPGs communities are required.

References

Anderson, J. C., & Gerbing, D. W. (1992). Assumptions and comparative strengths of the two-step approach. *Sociological Methods & Research, 20*(3), 321–333.

Armstrong, A., & Hagel, J. III, (1996). The real value of online communities. *Harvard Business Review* (May–June), 134–141.

Ashforth, B. E., & Mael, F. (1989). Social identity theory and the organization. *Academy of Management Review, 14*(1), 20–39.

Babin, B. J., & Boles, J. S. (1998). Employee behavior in a service environment: A model and test of potential differences between men and women. *Journal of Marketing, 62*(2), 77–91.

Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science, 16*(1), 74–94.

Bauer, H. H., Grether, M., & Leach, M. (2002). Building customer relations over the internet. *Industrial Marketing Management, 31*, 155–163.

Baumeister, R. F. (1998). The self. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., pp. 680–740). New York: McGraw-Hill.

Belk, R. W. (1988). Possessions and the extended self. *Journal of Consumer Research, 15*(2), 139–168.

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588–606.

Berry, L. L. (1995). Relationship marketing of services growing interest, emerging perspectives. *Journal of the Academy of Marketing Science, 23*(3), 236–245.

Bhattacharya, C. B., Rao, H., & Glynn, M. A. (1995). Understanding the bond of identification: An investigation of its correlates among art museum members. *Journal of Marketing, 59*(4), 46–57.

Bollen, K. A. (1989). *Structural equations with latent variables*. Toronto: John Wiley and Sons.

Brakus, J. J., Schmitt, B. H., & Zarantonello, L. (2009). Brand experience : What is it? How is it measured? Does it affect loyalty? *Journal of Marketing, 73*(2), 52–68.

Brignall, T. W., & Valey, T. L. (2007). An online community as a new tribalism: The world of warcraft. Paper presented at *the Proceedings of the 40th Hawaii international conference on system science*.

Chaudruri, A., & Holbrook, M. B. (2001). The chain of effects from brand trust and brand affect to brand performance: The role of brand loyalty. *Journal of Marketing, 65*(1), 81–93.

Chen, K., & Yen, D. C. (2004). Improving the quality of online presence through interactivity. *Information and Management, 42*(1), 217–226.

Dominick, J. R. (1999). Who do you think you are? Personal home pages and self-presentation on the world wide web. *Journalism and Mass Communication Quarterly, 76*(4), 646–658.

Ellison, N., Heino, R., & Gibbs, J. (2006). Managing impressions online: Self-presentation processes in the online dating environment. *Journal of Computer-Mediated Communication*, 11(2). <http://jcmc.indiana.edu/vol11/issue2/ellison.html> (article 2).

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

Garbarino, E., & Johnson, M. S. (1999). The different roles of satisfaction, trust, and commitment in customer relationship. *Journal of Marketing, 63*(2), 70–87.

Goldsmith, R. E., & Flynn, L. R. (1992). Identifying innovators in consumer product markets. *European Journal of Marketing, 26*(4), 42–55.

Gruen, T. W., Summers, J. O., & Acito, F. (2000). Relationship marketing activities, commitment and membership behavior in professional associations. *Journal of Marketing, 64*(3), 34–49.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River (NJ): Prentice-Hall.

Hall, H., & Graham, D. (2004). Creation and recreation: Motivating collaboration to generate Knowledg Capital in online communities. *International Journal of Information Management, 24*, 235–246.

Hoffman, D., & Novak, T. P. (1996). Marketing in hypermedia computer-mediated environments: Conceptual foundations. *Journal of Marketing, 60*(July), 50–68.

Jung, T., Youn, H., & McClung, S. (2007). Motivations and self-presentation strategies on Korean-based 'Cyworld' Webblog format personal homepages. *CyberPsycholgy and Behavior, 10*(1), 24–31.

Kang, J., Ko, Y., & Ko, I. (2009). The impact of social support and psychological factors on Guld Members' flow and loyalty in MMORPG. *Asian Pacific Journal of Information Systems, 19*(3), 69–98.

Kim, C. K., Han, D., & Park, S. B. (2001). The effect of personality and brand identification on brand loyalty: Applying the theory of social identification. *Japanese Psychological Research, 43*(4), 195–206.

Kim, H. W., & Chan, H. C. (2007). Why people pay for digital items? Presentation desire of online identity. *11th Pacific-Asia Conference on Information Systems*, 214–226.

Kim, S. H., & Kang, J. Y. (2005). Effects of consumer characteristics on benefits sought and importance in attributes of durable goods: Emphasis on consumer innovativeness, social sensitivity, and consumer knowledge. *Journal of Korean Marketing Association, 20*(4), 209–226.

Lau, R. (1989). Individual and contextual influences on group identification. *Social Psychology Quarterly, 52*(3), 220–231.

Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin, 107*(1), 34–47.

Leary, M. R. (1995). *Self-presentation: Impression management and interpersonal behavior*. Boulder, CO: Westview Press.

Lee, Y. K., Lee, J. R., & Yoo, D. K. (2005). The structural relationships between interactivity, identification, relationship quality, and loyalty of e-brand in internet site. *Asia Pacific Journal of Information Systems, 15*(4), 1–26.

Liu, Y., & Shurm, L. J. (2002). What is interactivity and is it always such a good thing?: Implications of definitions, person and situation for the influence of interactivity on advertising effectiveness. *Journal of Advertising, 31*(4), 53–64.

Long, M. M., & Schiffman, L. G. (2000). Consumption values and relationships: Segmenting the market for frequency programs. *Journal of Consumer Marketing, 17*(3), 214–232.

Macneil, I. (1980). *The new social contract, an inquiry into modern contractual relations*. New Haven, CT: Yale University Press.

Mael, F. B., & Ashforth, E. (1992). Alumni and their alma mater: A partial test of the reformulated model of organizational identification. *Journal of Organizational Behavior, 13*, 103–123.

McMillan, S. J., & Hwang, J. S. (2002). Measures of perceived interactivity: An exploration of the role of direction of communication, user control, and time in shaping perceptions of interactivity. *Journal of Advertising, 31*(3), 29–42.

Midgley, D., & Dowling, G. (1978). Innovativeness: The concept and its measurement. *Journal of Consumer Research, 4*(4), 229–242.

Mitchell, W. L (1999). Moving the museum onto the Internet: The use of virtual entertainments in education about ancient Egypt. In J. A. Vince, R. A. Earnshaw (Eds.), *Vitruql Worlds on the Internet* (pp. 263–278). IEEE Computer Society Press.

Moorman, C., Zaltman, G., & Deshpand, R. (1992). Relationships between providers and users of market research: The dynamics of trust within and between organizations. *Journal of Marketing Research, 29*(August), 314–328.

Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing, 58*(3), 20–39.

Mullen, M. R. (1995). Diagnosing measurement equivalence in cross-national research. *Journal of International Business Studies, 26*(3), 573–596.

Muniz, A. M., Jr., & O'guinn, T. C. (2001). Brand community. *Journal of Consumer Research, 27*, 412–432.

Novak, T. P., Hoffman, D. L., & Yung, Y. F. (2000). Measuring the customer experience in online environments: A structural modeling approach. *Marketing Science, 19*(1), 22–42.

O'Reilly, C., III, & Chatman, J. (1986). Organizational commitment and psychological attachment: The effects of compliance, identification, and internalization of pro-social behavior. *Journal of Applied Psychology, 71*, 492–499.

Onkvisit, S., & Shaw, J. (1987). Self-concept and image congruence: Some research and managerial implications. *Journal of Consumer Marketing, 9*, 13–24.
Podsakoff, P. M., Mackenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903.
Roberts, G. C., & Treasure, D. C. (1992). Children in sports. *Sport Science Review, 1*, 46–64.
Rogers, E. M. (2003). *Diffusion of Innovations* (5th ed.). Free Press.
Rubin, K. H., Cathryn, L., & Rosemary, S. L. (1995). Social relationships and social skills: A conceptual and empirical analysis. In Shmuel Shulman (Ed.), *Close relationships and socioemotional development* (pp. 63–94). Westport, CT, US: Ablex Publishing.
Schau, H. J., & Gilly, M. C. (2003). We are what we post? Self-presentation in personal web space. *Journal of Consumer Research, 30*(3), 385–404.
Schlenker, B. R. (1975). Self-presentation: Managing the impression of consistency when reality interferes with self enhancement. *Journal of Personality and Social Psychology, 32*, 1030–1037.
Schlenker, B. R. (1980). *Impression management: The self-concept, social identity, and interpersonal relations*. Monterey, CA: Brooks/Cole.
Schneider, D. J. (1981). In James T. Tedeschi (Ed.), *Tactical self-representations: Toward a broader conception, in impression management theory and social psychological research* (pp. 23–40). New York: Academic Press.
Shamir, B. (1990). Calculations, values, and identities: The sources of collectivistic work motivation. *Human Relations, 43*(4), 313–332.
Shavitt, S. (1990). The role of attitude objects in attitude functions. *Journal of Experimental Social Psychology, 26*, 124–148.
Singh, J. (1995). Measurement issues in cross national research. *Journal of International Business Studies, 26*(3), 597–619.
Sirgy, M. J. (1982). Self-concept in consumer behavior: A critical review. *Journal of Consumer Research, 9*(4), 287–300.
Szmigin, I., Canning, L., & Reppel, A. E. (2005). Online community: Enhancing the relationship marketing concept through customer bonding. *International Journal of Service Industry Management, 16*(5), 480–496.
Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–48). Monterey, CA: Brooks/Cole.
Trammell, K. D., & Keshelaslwli, A. (2005). Examining the new influence – A self-presentation study of a-list blogs. *Journalism and Mass Communication Quarterly, 82*(4), 968–982.
Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford: Blackwell.
Underwood, R., Edward, B., & Robert, B. (2001). Building service brands via social identity: Lessons from the sports marketplace. *Journal of Marketing Theory and Practice (Winter), 1*, 13.
Ye, M., & Chen, L. (2006). System-performance modeling for massively multiplyer online role-playing games. *IBM System Journal, 45*(1), 45–58.
Yee, N. (2006). The demographics, motivations and derived experiences of users of massively multi-user online graphical environment. *Teleoperaors and Virtual Environment, 15*, 309–329.
Zarantonello, L., Schmitt, B. H., & Brakus, J. J. (2007). Development of the brand experience scale. *Advances in Consumer Research, 34*, 580–582.
Zhao, Y., Wang, W., & Zhu, Y. (2010). Antecedents of the closeness of human-avatar relationships in a virtual world. *Journal of Database Management, 21*(2), 41–68.
Ziamou, P., & Ratneshwar, S. (2003). Innovations in product functionality: When and why are explicit comparisons effective? *Journal of Marketing, 67*(2), 49–61.