Examining Social Needs Satisfaction and Gamer Loyalty in the Massively Multiplayer Online Role-playing Game (MMORPGs) Context: From the Perspective of Social Capital

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Abstract

Massively Multiplayer Online Role-playing Games (MMORPGs) are popular, team-oriented online games. Such games provide gamers opportunities to immerse themselves in a virtual social world. The social side of gaming is an important incentive for gamers to engage in. Gamers get together to form a gaming community, which could develop into strong friendships and social ties. Because social capital is a substantial resource in establishing a community (Lin & Lu, 2011), this study aims to explore the social capital that develops within gamers in the MMORPG context. Based on the empirical analysis of the data from 619 MMORPG gamers of Taiwan, the results revealed that social capital (including social ties, social trust, and shared goals) can significantly affect social needs satisfaction; also, social needs satisfaction was found to influence gamer loyalty. Moreover, team norms play a moderating role between social needs satisfaction and gamer loyalty. The research framework and the findings of this study could be applied to team-based online games, teamwork, and team norms phenomenon.

Keywords: MMORPGs, social capital, social needs satisfaction, gamer loyalty, team norms

1. Introduction

In recent years, the online game market of the Asia/Pacific region excluding Japan (APEJ) is growing steadily. The online game revenue in APEJ is projected to reach US $30.39 billion in 2018, and the number of online gamers is projected to increase to 150 million in 2018. China, Taiwan, and Korea are the top three markets across the APEJ region, generating 95.56% of the APEJ online game revenue (CTIMES, 2015).

In Taiwan, 41.4% of the population has played online games (Han, 2014). The number of online gamers continues to rise in Taiwan due to the government's support on the online game industry, as well as the development of information technology and Internet infrastructure. On October 12, 2012, Taipei Assassins (TPA), a Taiwanese team, won the championship title of the famous PC multiplayer game, *League of Legends World Championship Finals*, defeating teams from the USA, Europe, and Southeast Asia; the team took home US $1 million as prize money (Benedetti, 2012). This good news roused Taiwan's online game industry and the community's interest in world online game competitions. Some companies begun to sponsor and train potential teams. Further, a lot of young individuals formed teams and devoted their time in online game training in order to pursue their dream of becoming the best team in the world and eventually winning the world championship title. The *League of Legends* has become the most played PC game in Taiwan and in the world in the past few years (Statista, 2015).

Online games in Massively Multiplayer Online Role-playing Games (MMORPGs), such as *League of Legends*, are continuing to expand and grow in popularity. MMORPGs enable numbers of gamers to simultaneously play together in a specific virtual game world. The gamers can play MMORPGs over network-capable platforms such as gaming consoles, personal computers, and other mobile devices. MMORPGs are team-based games, wherein several teams compete with each other, with the goal of destroying the opponent's base. A team is composed of several players assuming the role of their chosen characters, each with distinct abilities. To form a competitive team, players should discuss and formulate their real-time strategy and playstyle as a group, and designate necessary roles and responsibilities for the game. Each gamer has to consider the needs of the team and has to choose a character that will complement other members' characters to benefit the team as a whole and create an efficient team composition (Nagygyörgy et al., 2013; League of Legends, 2015). Each gamer has to accomplish character-based activities, as well as the team's large-scale activities; therefore, team members have to interact and communicate with each other, and work together to complete the tasks of the game (MMO Worlds, 2015).

Because MMORPGs are team-based games, gamers usually join a gaming community where they cultivate their ambition to defeat the opposing team and win. Players encounter numerous difficulties during the competition; thus, they have to cooperate with their team and support each other. To improve the team's skill level and become a coordinated team, the members usually get together and devote a lot of time and effort to train and accumulate experience and capabilities. Through this, team members gradually form affection and friendship, and build strong attachments with each other; thus, their social needs are satisfied through team participation (Ommundsen et al., 2005; Yee, 2006). Online games offer a place for gamers to meet other people, and develop social relationships within the community where they can seek support, companionship, and belongingness from others (Chiu et al., 2011). Since gamers have to administrate and coordinate team activities, these experiences facilitate social interactions and form social capital for the team. Hau and Kim (2011) found that social capital (including social ties, social trust, and shared goals) could reinforce online gamers' free sharing of innovation-conducive knowledge in the online game community.

Trepte et al. (2012) found that online games could result in strong social ties. The physical and social proximity as well as familiarity among gamers could foster the formation of online bridging social capital and bonding social capital, which could then generate offline social support. Cole and Griffiths (2007) indicated that MMORPGs provide highly social interactive environments in which gamers may create emotional relationships and close friendships. Social interactions are essential in MMORPGs because these games entail teamwork and require team players to depend on each other to complete the different challenges of the game. Such social interactions may occur both within and outside of MMORPGs, and prompt gamers to make both online and real-life friends. Therefore, online games have become popular leisure time activities. The social interaction that occurs in online games is an important motivator for players to participate in the games (Trepte et al., 2012). Because social capital is a substantial resource in establishing a community (Lin & Lu, 2011), this study aims to explore the social capital that develop within gamers in the MMORPGs context. Teng and Chen (2014) indicated that social interactions and social needs fulfillment are critical for online gamers to repeatedly play a specific game and generate gamer loyalty; therefore, the purpose of this study is to investigate the relationship between social needs satisfaction and gamer loyalty.

The MMORPG gamers frequently get together to play a specific game, and these

gamers generally have a constant group of partners. Winning an online gaming competition does not only involve the efforts of the individual gamer, but it is the result of the team's joint efforts. In order to win, gamers have to offer constructive advice, share ideas, and exhibit gaming-related knowledge and task-solving skills with other teammates in order to design effective game strategies. They also need to provide necessary assistance for others to defeat their opponents. That is, each gamer not only pursues personal benefits but may also need to comply with the team's norms and goals. The members of the team are governed by the rules and regulations of the team's norms. Team norms guide the member's behavior, reduce role confusion, and increase team cohesiveness (Teng & Chen, 2014). Such a norm-oriented gaming community induces gamers' civic behavior.

As gamers contribute to the team, they receive social satisfaction from each other. This may lead to enduring relationships and create loyalty towards a specific game. Typically, most members cooperate and obey the team's norms; however, some members contribute little to the team's output (Fehr & Fischbacher, 2004). Those gamers who cooperate and contribute highly to the team generally receive more reciprocal feedback and social interactions from other members, satisfying their social needs and making them more willing to play the same game in the future. Such effects, in contrast, would not be significant for low contributors.

Gamers usually get tired of old and present games, and get fascinated by new and novel ones; therefore, gamer loyalty seems to be a critical factor for the online game providers to retain their customers. Prior studies mentioned above have investigated the social capital of online games on various dimensions; however, no study has constructed a framework to examine the relationships among social capital, social needs satisfaction, and gamer loyalty. Further, prior studies have ignored the effect of team norms; thus, this study aims to fill these research gaps. The objectives of this study are as follows:

1. To identify how the social capital theory can be applied in the MMORPGs context.
2. To explore how the social capital among MMORPGs gamers could enhance gamers' social needs satisfaction.
3. To investigate the relationship between social needs satisfaction and gamer loyalty.
4. To understand how team norms could mediate the relationship between social needs satisfaction and gamer loyalty.

2. Literature Review and Hypotheses Development

2.1 Social Capital

Social capital is established, developed and strengthened through members' social interactions; and it can facilitate mutual benefits for the group or network members (Riedl et al., 2013). Nahapiet and Ghoshal (1998) defined social capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (p. 243). They suggested that social capital includes structural, relational, and cognitive dimensions. The structural dimension is described as the actors' overall pattern of connections; the relational dimension is defined as the personal relationships developed through long-term interactions; and the cognitive dimension is referred to as the actors' resources of shared representation, interpretations, and meaningful systems.

Prior studies have applied social capital theory into several online games contexts. Tseng et al. (2015) found that social capital could form significant switching cost for gamers; thus, gamers can have greater continuance intention toward their online game communities. Molyneux et al. (2015) indicated that when gamers develop gaming social capital in multiplayer video games, they are more likely to develop face-to-face social ties with other gamers in real-world

communities. Trepte et al. (2012) found that in e-sports clans, physical proximity, social proximity, and familiarity could foster gamers' clan bridging social capital and clan bonding social capital. In addition, online game activities could facilitate gamers in engaging with other clan members off line; through this, gamers receive additional offline social support from others. Following the above study, Reer and Krämer (2014) indicated that physical proximity, social proximity, and familiarity could lead gamers to communicate more with their fellow players, and to show self-disclosure behavior toward their fellow players. Consequently, bridging social capital and bonding social capital are developed within the gaming-communities. As mentioned above, social capital plays a critical role for online game players….

In MMORPGs, gamers share the same interests, needs, and goals when playing games. Most gamers arrange a steady group of partners for team activities and establish lasting relationships and friendships with them; therefore, social capital is accumulated and jointly owned by the members of a team. This study follows Nahapiet and Ghoshal (1998) in classifying social capital in three dimensions namely, structural, relational, and cognitive. Furthermore, this study adopts Hau and Kim's (2011) manifestations of each dimensions which include social ties (structural dimension), social trust (relational dimension), and shared goal (cognitive dimension), because their research background also focused on MMORPGs context. The hypotheses of this study are based on these three dimensions of social capital.

2.2 Social Ties

Nahapiet and Ghoshal (1998) indicated that the fundamental facets of the structural dimension are the network ties among individuals. Strong and symmetrical ties could induce individuals to develop emotional relationships among each other; such relationships could further reinforce individuals' social interactions. Social ties refer to a set of social interactions between individuals (Wang & Chang, 2013), including the amount of time spent, the communication frequency, the affective intensity, and the reciprocal feedback among individuals (Chiu et al., 2006; Granovetter, 1973). Blanchard and Markus (2004) suggested that social ties play an important role in generating a favorable attitude and attachment to a certain online community.

Since MMORPGs are team-based, gamers get together to build their own group to contest with other teams. During competitions, cooperation among team members is vital while participating in heavy battles to defeat their opponents. Under such intense interactions, the gamers may feel a strong sense of belongingness, forming strong social ties and establishing intimate friendships with each member of the team. These positive feelings make playing online games enjoyable for gamers, satisfying their social needs and generating positive reinforcement for further participation (Teng & Chen, 2014). Therefore, this study proposes the following hypothesis:

H1: Social ties positively influence gamers' social needs satisfaction.

2.3 Social Trust

Trust refers to the perception of trustworthiness of the exchange partners, and is generally comprised of particular beliefs such as honesty, integrity, reliability, credibility, and competence (Kim et al., 2012). People are more likely to engage in cooperative interactions and social exchanges under trusting relationships. Moreover, gamers believing in their partners' competence, capability, reliability, and openness signify their confidence in them (Nahapiet & Ghoshal, 1998). Nonaka (1994) mentioned that inter-personal trust plays an important role in teams, and that trust is a critical foundation for collaboration (Ward & Smith, 2004). Furthermore, a trusting environment could make individuals more satisfied (Hsu et al., 2015).

While playing MMORPGs, each gamer serves a specific role and responsibility. They are also expected to cooperate closely and provide assistance to their team-

mates; therefore, social trust among members is necessary for the team. When teammates trust each other, this means that they believe in each other's support and capability in completing collective tasks. A trusting atmosphere is helpful for gamers to join forces during the game to resist an invasion. Because every gamer has to be accompanied by another gamer of the team during competitions, this create emotional interactions which are likely to fulfill gamers' social needs. Based on these arguments, this study proposes the following hypothesis:

H2: Social trust positively influences gamers' social needs satisfaction.

2.4 Shared Goals

Shared goals are not to be held individually; they are generally possessed in a common group and must be achieved with others (Fowers, 2004). Interpersonal relationships could supply social support to facilitate and assure goal attainment (Huang et al., 2015). When individuals are interdependent and collaborative, shared goals will lead the group to persist in order to accomplish their mutual goals (Koster et al., 2007). Hau and Kim (2011) mentioned that members of online communities are bound together through shared goals, common norms, or values.

Online games are goal-directed leisure activities (Neys et al., 2014). Teng and Chen (2014) suggested that since online gamers form teams to overcome difficult tasks, such task-focused interactions and team participation serve as positive reinforcements to satisfy gamers' social needs through gaming. While playing MMORPGs, teammates share the common goals of combating the opposing teams and winning the final victory. The members have to constantly cooperate with each other to ensure the achievement of their goals. These intense interactions lead gamers into forming strong attachments with the team; thus, satisfying their social needs. Accordingly, the following hypothesis is suggested:

H3: Shared goals positively influence gamers' social needs satisfaction.

2.5 Social Needs Satisfaction and Gamer Loyalty

Oliver (1997) defined loyalty as "a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, *despite* situational influences and marketing efforts having the potential to cause switching behavior" (p. 392). In this study's research context, loyalty means gamers expressing continued motivation to play the same game with their partners. There are numerous online games in the market, and gamers can easily switch between different games. Therefore, it is important for game providers to constantly attract gamers and attempt to make them attached to their games (Teng & Chen, 2014).

The relationship between satisfaction and loyalty has been examined by a great many studies. Szymanski and Henard's (2001) meta-analysis found that satisfaction has a positive effect on customer loyalty. To match the MMORPGs research setting, this study adapted the relationship between satisfaction and customer loyalty to social needs satisfaction and gamer loyalty. Teng and Chen (2014) suggested that the social needs of online gamers include acceptance and affiliation, and that social needs satisfaction involve online gamers' needs for socialization, relationships, and teamwork which can be obtained in a gaming team or community. When gamers experience social satisfaction through playing a particular online game, such positive emotion may strengthen gamers' motivation to keep playing the same game and become loyal to it; therefore, social needs satisfaction is positively related to gamer loyalty, as observed by Teng and Chen's (2014) study results. Based on this, the following hypothesis is asserted:

H4: Social needs satisfaction positively influences gamer loyalty.

2.6 Team Norms

MMORPGs gamers take collective actions to achieve team goals and interests; thus, these gamers gradually form a steady

virtual community. The team norms work to enhance members' cooperative behavior and support efficient outcomes. Norms are socially shared beliefs and guidelines for members to express expected and accepted behavior. Moreover, norms are regular behavior patterns developed by members; therefore, these patterns are expected by members and are relatively stable (Pillutla, & Chen, 1999).

During online game competitions, each gamer is not only expected to contribute to one's own success, but also to provide complementary and necessary efforts to help partners. Collective actions such as cooperation, social support, and contribution to others could lead members in considering games as important to them (Lin, 2011). When members follow the team's norms and connect efforts to create group synergy and collective values, they experience a sense of belongingness to the team. Gamers share innovation-conductive knowledge through interactions and feedback to enhance their team's collective knowledge (Hau & Kim, 2011), as well as to develop real-time strategies to respond to evolving competitions; through this, team performance and effectiveness could improve considerably (Teng & Chen, 2014). Such interpersonal interactions could satisfy gamers' social needs, and could further serve as positive reinforcement to motivate them to repeatedly play the same game, thereby generating gamer loyalty (Teng & Chen, 2014).

Although most gamers follow team norms, express expected cooperative behavior, and contribute to the team at high levels, there are still low contributor gamers. In general, gamers ultimately decide whether or not to comply with team norms (Teng & Chen, 2014). Those who follow team norms and devote themselves to the team are more likely to enjoy collective achievements attached to a specific game. However, gamers who are not restricted by the team norms and contribute little may have weaker reinforcement to engage in team-based games. This implies that the two types of gamers may have different degrees of social satisfaction and ability to nurture different levels of loyalty towards the game; thus, compliance with team norms plays a moderate role in the relationship between social needs satisfaction and loyalty in the MMORPGs context. Based on these arguments, this study proposes the fifth hypothesis. The conceptual model of this study is shown in Figure 1.

H5: Team norms positively moderate the relationship between social needs satisfaction and gamer loyalty.

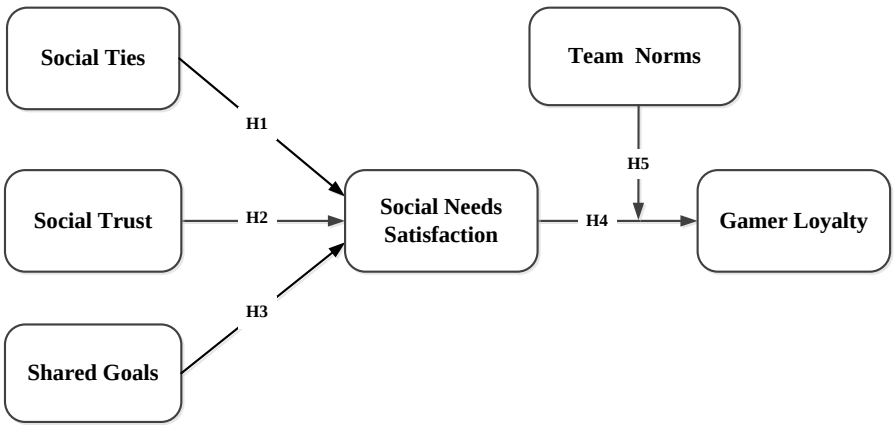


Figure 1: Conceptual Framework

3. Research Methodology

3.1 Measurement Development

This study conducted an empirical investigation for MMORPGs gamers. The questionnaire is comprised of two parts: the first part presented questions pertaining to the research model; while the second part solicited the demographic information and online game playing behavior. All the measurement items used had been validated in previous studies. Questionnaire items were adapted from previous studies as well with slight modifications to meet the MMORPG context. Items for social ties, social trust, and shared goals were adapted from Hau and Kim (2011); items for social needs satisfaction and gamer loyalty were based on Teng and Chen (2014); and items for team norms were adapted and developed from Nambisan and Baron (2009). The five-point Likert scale was utilized, with "1" being *"strongly disagree"* and "5" being *"strongly agree"*. In addition, some industry experts and online gamers were invited to revise and refine the questionnaire. The validity of the scale items were also improved through pre-testing.

3.2 Data Collection and Profiles of the Respondents

A large number of young people and students in Taiwan play online games. Many gamers prefer to get together to play MMORPGs because these games are exciting, intense, and highly interesting. The *League of Legends* is one of the most popular MMORPGs in the world, and in Taiwan; therefore, this study selected the gamers of *League of Legends* as participants for this study. They were recruited from January 28 to February 1, 2015 during the Taipei Game Show which was held in Taipei International Convention Center in Taiwan. The Taipei Game Show is the biggest game show in Taiwan and is being held annually. This show always attracts numerous gamers because it brings together several exhibitors from online game providers and computer equipment companies. Gamers who attended the show and who had played *League of Legends* were recruited to answer the study's survey questionnaire. To encourage participation, participants were offered a gift as an incentive. A total of 730 questionnaires were distributed, and a total of 619 valid responses were returned for subsequent analysis.

The majority of the respondents were males (83.0%). In Taiwan, the gender proportion of general online gamers is around 50% for males and 50% for females. However, approximately 80% of the eSports participants are males (Yahoo Kimo, 2017). Since *League of Legends* belongs to the eSports category, the gender profile of this current study resembled Taiwan's online game market. Most of the respondents were single (95.8%), and were mostly less than 20 years old (62.8%) and between 21 to 30 years old (33.1%). Nagygyörgy et al. (2013) reviewed a large number of previous studies and found that most MMORPG gamers in Asia were single males, aged 21 years and below, and were mostly students; thus, the demographic background of the current study's respondents is similar with the previous studies.

Over half of the respondents had played *League of Legends* for 1 to 3 years (34.9% for 1-2 years and 27.8% for 2-3 years). Further, 41.5% of the respondents had played this game almost every day while, 38.0% had played this game several times a week. In addition, most of the respondents had played *League of Legends* for 1 to 5 hours each time (47.7% for 1-3 hrs and 31.5% for 3-5 hrs). Further, 35.4% of the respondents reported playing this game less than 10 hours per week while, 33.8% between 11 to 20 hours per week. Meanwhile, the financial expenditure on this game was not significant; most respondents spent less than 20 USD on games monthly. The demographic characteristics and gaming-related profiles of the respondents are shown in Table 1.

Table 1: Demographic Profiles of the Respondents

Variables	N	%
Gender		
Male	514	83.0%
Female	105	17.0%
Marital Status		
Single	593	95.8%
Married	26	4.2%
Age		
20 and below	389	62.8%
21-30	205	33.1%
31-40	19	3.1%
41-50	3	0.5%
51 and above	3	0.5%
Experience of playing *League of Legends*		
Less than 1 year	100	16.2%
1-2 years	216	34.9%
2-3 years	172	27.8%
More than 3 years	131	21.2%
Frequency of playing *League of Legends*		
Almost every day	257	41.5%
Several times a week	235	38.0%
Several times a month	78	12.6%
Several times half one year	49	7.9%
Time spent on *League of Legends* (each time)		
Less than 1 hr	54	8.7%
1-3 hrs	295	47.7%
3-5 hrs	195	31.5%
5-10 hrs	55	8.9%
More than 10 hrs	20	3.2%
Time spent on *League of Legends* (hr/week)		
Less than 10 hrs	219	35.4%
11-20 hrs	209	33.8%
21-30 hrs	106	17.1%
31-40 hrs	51	8.2%
More than 41 hrs	34	3.2%
Monthly gaming costs[a]		
20 dollars or less	559	90.3%
21 dollars or more	60	9.7%

Note. [a] USD

3.3 Data Analysis and Results

Partial least square (PLS) can analyze the relationships among the principal constructs and their underlying items. Results of the PLS can be used to examine whether the theoretical hypothesized relationships could be empirically accepted, as well as to evaluate whether the measures are well related to their constructs (Chin, 1998; Pavlou & Chai, 2002). PLS is suitable for exploratory studies because the relationships among social capital, social needs satisfaction, gamer loyalty, and team norms have not been previously verified in the MMORPGs context. This study utilized the Smart PLS V.2 software developed by Ringle et al. (2005) to test the hypotheses (Hulland, 1999; Ainuddin et al., 2007). The two-step approach recommended by Anderson and Gerbing (1988) was performed to examine the measurement model and the structural model.

To test the structural model for the direct effects (H1, H2, H3, and H4), this study used 619 respondents as the data set. Several teams compete against each other in MMORPGs, with each team composing of several gamers. In a team, some members highly obey team norms, while others do not. Such differences not only affect team performance, but also affect team relationships. In order to examine the potential moderating effect of team norms (H5), the 619 respondents were divided into two groups (high team norms vs. low team norms) based on the mean of team norms. The moderating effect was verified by two-group comparison procedure. Team norms comprised four items; the mean for the total respondents (N=619) was 3.90 (using the five-point Likert scale). The group with high intention for compliance in team norms included 361 respondents, and the group with low intention for compliance with team norms included 258 respondents. The classification result showed significant differences in the degree of team norms between the two gamer groups as shown in Table 2.

Table 2: The Degree of Compliance to Team Norms

	High group[a]	Low group[b]	Mean difference t-value (p-value)[c]
1. I help teammates by promptly answering their gaming-related problems. [d]	4.36	3.19	20.815 (< 0.001)
2. I offer beneficial ideas and suggestions to the team. [d]	4.42	3.28	19.434 (< 0.001)
3. I try to be a responsible and contributing member of the team. [d]	4.39	3.23	18.993 (< 0.001)
4. I consistently convey gaming-related knowledge and task-solving skills to other teammates. [d]	4.35	3.19	19.545 (< 0.001)

[a] All values are means; N=361.
[b] All values are means; N=258.
[c] Two tailed t-test for independent samples.
[d] Five-point rating scale: 1 strongly disagree; 5 strongly agree.

3.4 Measurement Model for Total Group

The internal reliability of the measurement items was assessed through Cronbach's α using SPSS software. All Cronbach's α values ranged from 0.827 to 0.891, which indicate that the items have good internal validity. Consequently, confirmatory factor analysis was conducted to examine the measurement model by determining the convergent validity and the discriminant validity of the measurement items. According to the study by Hau and Kim (2011), the following three criteria must be satisfied in order to have a good convergent validity: (1) the composite reliability (CR) should exceed 0.7 (Chin, 1988); (2) the average variance extracted (AVE) should exceed 0.5 (Chin, 1988; Fornell and Larcker, 1981); and (3) the t-value should exceed 1.96 (Gefen & Staub, 2005). Based on the results, the CRs ranged from 0.884 to 0.925, AVEs ranged from 0.626 to 0.755, and t-values ranged from 21.645 to 64.373. As shown in Table 3, the convergent validity was verified because the criteria for CRs, AVEs, and t-values were all satisfied.

The discriminant validity was analyzed by examining whether the square roots of the AVEs from the constructs were greater than other correlation coefficients in the research model (Fornell & Larcker, 1981). Table 4 shows that each construct's square roots of the AVEs along the diagonal line was greater than other correlation coefficients in the lower triangle area; thus, the scale has good discriminant validity. Overall, these statistics show that the measurement constructs were appropriate for subsequent structural model estimation.

Table 3: Internal Reliability and Convergent Validity – Total Group

Construct	Cronbach's α	Composite reliability (CR)	Average variance extracted (AVE)	Item	Loading	Mean	Standard error	t-value
Social ties	0.827	0.884	0.656	Tie1	0.818	3.96	0.037	40.320
				Tie1	0.853	3.72	0.039	52.933
				Tie1	0.746	3.99	0.035	21.933
				Tie1	0.819	3.77	0.038	32.653
Social trust	0.868	0.905	0.655	Trust1	0.796	3.84	0.038	27.442
				Trust2	0.844	3.86	0.037	44.372
				Trust3	0.759	3.50	0.043	24.796
				Trust4	0.839	3.53	0.042	43.661
				Trust5	0.806	3.48	0.043	33.702
Shared goals	0.852	0.900	0.693	Goal1	0.822	3.86	0.037	39.361
				Goal2	0.830	3.91	0.036	35.768
				Goal3	0.860	3.79	0.036	49.096
				Goal4	0.816	3.82	0.035	33.745
Social needs satisfaction	0.891	0.925	0.755	Satisfaction1	0.881	3.66	0.039	64.373
				Satisfaction2	0.899	3.75	0.037	58.332
				Satisfaction3	0.885	3.78	0.038	70.167
				Satisfaction4	0.808	3.90	0.034	32.445
Gamer loyalty	0.850	0.893	0.626	Loyalty 1	0.754	3.83	0.040	26.008
				Loyalty 2	0.784	4.01	0.034	23.720
				Loyalty 3	0.793	4.06	0.030	27.660
				Loyalty 4	0.863	4.02	0.033	58.757
				Loyalty 5	0.758	3.78	0.038	21.645

Table 4: Square Roots of AVE and Correlation Matrix – Total Group

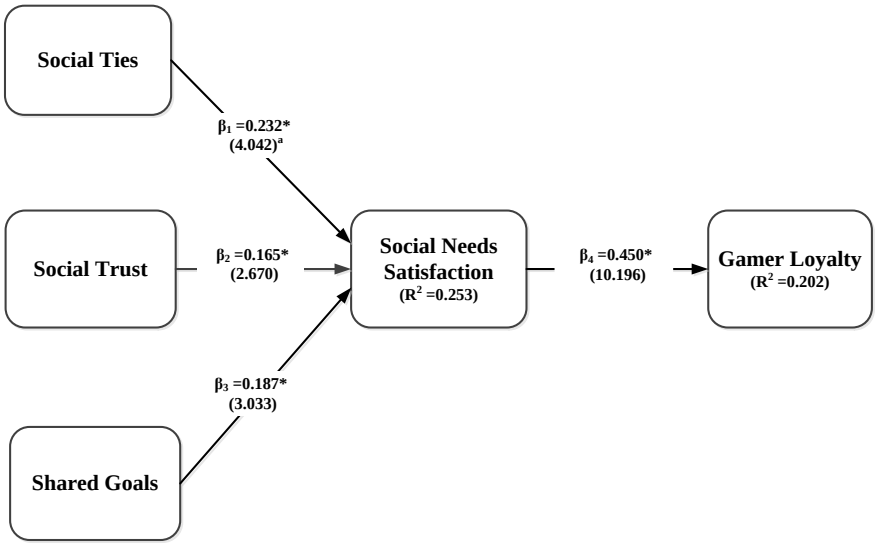
Construct	Social ties	Social trust	Shared goals	Social needs satisfaction	Gamer loyalty
Social ties	**0.810**				
Social trust	0.632	**0.809**			
Shared goals	0.644	0.537	**0.832**		
Social needs satisfaction	0.456	0.442	0.414	**0.869**	
Gamer loyalty	0.167	0.083	0.537	0.450	**0.791**

Note. Diagonal elements in bold are the square roots of the average variances extracted (AVE)

3.5 Structural Model for Total Group

The results of the test for the structural model for the direct effects (H1, H2, H3, and H4) using the overall sample size (N=619) are presented in this section. Based on the bootstrapping method, this study employed a resampling technique to test the structural model. The bootstrapping procedure was set at 500 random samples repeatedly drawn from the data (Gefen et al., 2000).

Figure 2 shows the statistical results of the PLS model. H1 to H3 described the relationship between MMORPG gamers' social capital and social needs satisfaction while, H4 described the relationship between social needs satisfaction and gamer loyalty. This study included three components for social capital namely social ties, social trust, and shared goals. The results showed that social ties, social trust, and shared goals could significantly affect social needs satisfaction ($\beta_1 = 0.232$, $t = 4.042$, $p < 0.001$; $\beta_2 = 0.165$, $t = 2.670$, $p < 0.001$; $\beta_3 = 0.187$, $t = 3.033$, $p < 0.001$). Furthermore, social needs satisfaction could significantly affect gamer loyalty ($\beta_4 = 0.450$, $t = 10.196$, $p < 0.001$). As expected, the results supported H1, H2, H3, and H4.



Note. [a] Path coefficient with its t-value in parenthesis; *The coefficient is significant at the level of 0.001; R^2 is the amount of variance explained.

Figure 2: Results of the PLS Path Scheme – Total Group

3.6 Measurement Models for Subgroups

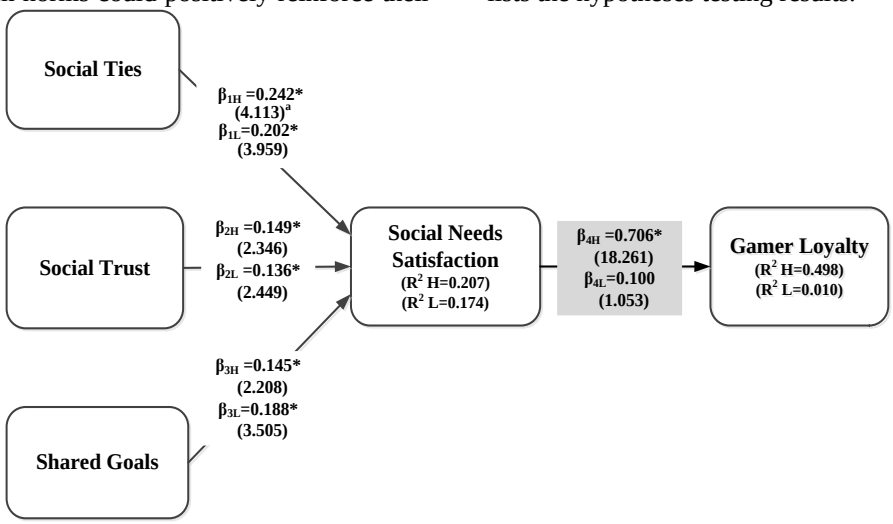
The previous analysis procedures and the same criteria were utilized to test the measurement models for the two subgroups for team norms. For the group with high intention for compliance in team norms (N=361), all Cronbach's α values ranged from 0.797 to 0.911, CRs ranged from 0.865 to 0.938, AVEs ranged from 0.610 to 0.791, and t-values ranged from 13.424 to 83.146; all of which exceeded the recommended levels. In addition, the statistics revealed good discriminant validity. Consequently, for the group with low intention for compliance in team norms (N=258), all Cronbach's α values ranged from 0.761 to -0.832, CRs ranged from 0.843 to 0.882, AVEs ranged from 0.537 to 0.653, and t-values ranged from 2.117 to 53.371; correspondingly, all of which exceeded the recommended levels. Also, the results showed good discriminant validity. Based on this, the measurement constructs of the two subgroups were considered appropriate for further structural model estimation.

3.7 Structural Model for Subgroups

To examine whether team norms could moderate the relationship between social needs satisfaction and gamer loyalty (H5), the structural model was tested based on the data of the 361 gamers with high intention for compliance in team norms, and the 258 gamers with low intention for compliance in team norms. The results were derived from the bootstrapping procedures. For the group with high intention towards team norms (N=361), the results indicate that social ties, social trust, and shared goals, could significantly affect social needs satisfaction (β_{1H} = 0.242, t = 4.113, $p < 0.001$; β_{2H} = 0.149, t = 2.346, $p < 0.05$; β_{3H} = 0.145, t = 2.208, $p < 0.05$). In addition, the results showed that social needs satisfaction could significantly affect gamer loyalty (β_{4H} = 0.706, t = 18.261, $p < 0.001$). For the group with high intention for compliance in team norms, all hypotheses were supported.

Moreover, for gamers with low intention towards compliance in team norms (N=258), the results indicate that social ties, social trust, and shared goals could significantly influence social needs satisfaction

(β_{1L} = 0.202, t = 3.959, p < 0.001; β_{2L} = 0.136, t = 2.449, p < 0.01; β_{3L} = 0.188, t = 3.505, p < 0.001). However, social needs satisfaction does not have any influence on gamer loyalty (β_{4L} = 0.100, t = 1.053, p > 0.1). In summary, the results showed that social capital (social ties, social trust, and shared goals) for both groups could significantly affect social needs satisfaction. Furthermore, social needs satisfaction of gamers with high intention for compliance in team norms could positively reinforce their game loyalty; however, this effect was not significant for gamers with low intention for compliance in team norms. The findings indicate that team norms could indeed moderate the relationship between social needs satisfaction and gamer loyalty especially for gamers with high compliance; thus, H5 is verified. Figure 3 summarizes and compares the results of testing for the structural model for groups with high and low intention for compliance with team norms, and Table 5 lists the hypotheses testing results.



Note. [a] Path coefficient with its t-value in parenthesis; * the coefficient is significant at the level of 0.01; R^2 is the amount of variance explained; H represents group of gamers with high intention for compliance in team norms; L represents the group of gamers with low intention for compliance in team norms.

Figure 3: Results of the PLS Path Scheme – Comparison of High and Low Groups

Table 5: Summary of Hypotheses Test Results

Hypothesized path	Hypothesized direction	Result direction	Path coefficient
H1: Social ties → Social needs satisfaction (total group, N=619)	+	+	5rt6
H2: Social trust → Social needs satisfaction (total group, N=619)	+	+	0.165*
H3: Shared goals → Social needs satisfaction (total group, N=619)	+	+	0.187*
H4: Social needs satisfaction → Gamer loyalty (total group, N=619)	+	+	0.450*
H5: the mediating effect of team norms			
Social needs satisfaction → Gamer loyalty (high group, N=361)	+	+	0.706*
Social needs satisfaction → Gamer loyalty (low group, N=258)	+	+	0.100

* Denotes p < 0.001.

4. Discussion

Massively Multiplayer Online Role-playing Games (MMORPGs) are popular, team-oriented online games. Such games provide gamers opportunities to immerse themselves in a social world (MacManus, 2012). The social side of gaming seems to be an important incentive for gamers to engage in (Trepte et al., 2012). Gamers get together to form a gaming community, which may gradually develop into strong friendships and social ties. This study examined the relationship between gamers' social needs satisfaction and loyalty in MMORPG gamers by utilizing social capital as the theoretical foundation. It is argued that social capital, which is developed by team members, is likely to satisfy members' social needs, which could further result in loyalty towards a specific game. Since teamwork is governed by team norms, and team norms could influence members' behavior and psychology, this study also investigated the moderating effect of team norms on the relationship between social needs satisfaction and loyalty. The research framework and the findings of this study could be applied to team-based online games, teamwork, and team norms phenomenon.

There are various types of online games; one possible reason why people choose to play MMORPGs is because these are team-oriented games which offer social opportunities for gamers to meet other people. While playing, gamers will not feel alone because they are a part of a group of people with similar interests and goals. Because of this, gamers receive emotional support from each other, and feel a sense of belongingness, which may gradually develop into close and stable friendships. Such social needs for intimate relationships and sense of belongingness are important factors for gamers to continuously participate in games, and for team-oriented games to bond individual gamers tightly. Furthermore, social capital indicates the value of social relations within a social network, which could facilitate members to produce individual and collective benefits (Riedl et al., 2013). Because social capital is accumulated through members' interactions, this study proposed social capital as the antecedent factor for online gamers' social needs satisfaction. The results of this study revealed that all three sub-dimensions of social capital (social ties, social trust, and shared goals) have a positive and significant influence on social needs satisfaction; therefore, H1, H2, and H3 are supported.

At present, most people spend a significant portion of their time online every day. Some people also allot a certain amount of time for playing online games, which now has become a popular activity during leisure time (Trepte et al., 2012). There are numerous novel and interesting online games on the markets. Individuals get easily attracted by various online games and they can effortlessly transfer to different online games with a little switch cost. This study therefore, examined the factors that could induce gamers to remain loyal to a specific online game. The empirical findings verified that gamers' social needs satisfaction could positively influence gamers' loyalty towards the same game, thereby supporting H4.

Online game communities are informal networks formed by a group of gamers; thus, team norms play a critical role in governing the members of a team. This study proposed that compared to gamers with lower intention towards team norms, gamers who highly comply with team norms could perceive higher level of social needs satisfaction, which could consequently result in a higher degree of game loyalty. The empirical findings of this study demonstrated the moderating effect of team norms; therefore, H5 is supported.

5. Conclusions

The online game industry has developed rapidly, resulting in stronger market competition. Online game providers both need to continuously improve their online games to attract new customers, and to design strategies to satisfy and retain their current customers. The findings of this research

shed light on several areas that could be of advantage to online game providers. For instance, because teamwork is an essential characteristic of MMORPGs (Teng & Chen, 2014), MMORPG providers should design teamwork mechanisms that would enhance opportunities for gamers to communicate, interact, share information, cooperate, and create collective goals. Through this, gamers could develop intimate social networks and create social capital.

MMORPGs offer platforms for numerous gamers concurrently playing the same games. Under the teamwork mechanism, team members have to work together and design team strategies to defeat the opposing team. Increasing the degree and level of interaction and cooperation opportunities could strengthen social ties among members of the team. Since the empirical findings of this study have shown that social ties could positively influence social needs satisfaction, online game providers should design a more large-scale team tasks for collective activities. Furthermore, Trepte et al. (2012) indicated that online games could foster strong social ties for gamers; also, social capital formed by gamers in online contexts could be transferred to offline settings for offline social support and offline friendships. Therefore, online game providers should not only design online activities to enhance gamers' virtual social ties, but also include offline activities for gamers to strengthen real life social ties. The synergy of virtual and real-life social ties is likely to greatly satisfy gamers' social needs, which could strengthen game loyalty.

Inter-personal trust is important for team collaboration. When an individual gamer of a team playing MMORPGs believe that group members are competent and reliable, and are willing to provide necessary assistance, all members may want to devote themselves to the team resolutely and work together to win the game. The empirical findings of this study suggested that social trust could positively affect social needs satisfaction. To cultivate a trusting climate in the virtual gaming environment, the online game providers should build sufficient communication channels for gamers to communicate instantly and efficiently. When gamers can share their ideas for gaming strategies, offer beneficial suggestions and information, and provide instant feedback for teammates through one-to-one, team-wide, or in-game public communication channels, misunderstanding and mistrust among members could be avoided; therefore, multiple communication channels are helpful for cultivating a trusting atmosphere, further satisfying gamers' social needs.

Compared to gamers who play single-player games for personal enjoyment, gamers who play MMORPGs immediately become part of a team and of a virtual community. Since MMORPGs are meant to be social, gamers become one with the team, sharing with them the ultimate goal of defeating the opposing team. When gamers share the same goals, they are likely to adhere to team norms and are willing to cooperate and help each other in game battles. The empirical results of this study indicated that shared goals could positively influence social needs satisfaction. In order to induce gamers to pursue the team's shared goals, online game providers could improve their teamwork-related reward systems. When precious artifacts or gems can only be obtained through specific teamwork performances, gamers will have a stronger incentive to accomplish common goals. Such teamwork-related reward systems enhance the value of shared goals among team members, further satisfying their social needs.

In playing single-player games, gamers enjoy greater freedom and take on fewer social burdens. On the contrary, although playing MMORPGs and joining a specific team could allow gamers to form intimate social ties with other members, the gamers have to comply with other members' schedules or preferences, as well as adhere to certain team regulations and display cooperative behavior. Because team members are connected and governed by team norms, gamers are restrained with certain limits and

must fulfill their responsibilities to play specific roles in the team. The empirical findings of the present study revealed that gamers who adhere to team norms could perceive higher social needs satisfaction and have stronger intention to engage in the same game, which generates game loyalty. Because the gaming teams are not formal organizations, most of the team norms are informal, invisible, and unwritten. The online game providers could offer a bulletin board platform for gaming teams to announce team regulations and important information. Such function could make team norms more tangible and could facilitate gamers to easily understand the requirements of the team and their individual responsibilities. This could increase the likelihood of gamers' compliance in team norms thus, improving team interaction and collaboration.

6. Directions for Future Research

Since social capital is critical for MMORPGs gamers, future research could explore the antecedent factors that may reinforce social capital. Firstly, social support involves the exchange of verbal or non-verbal messages between individuals, expressing information, referral, or emotion to decrease others' stress or uncertainty (Lin & Bhattacherjee, 2009). Social support could be actual, perceived instrumental, or indicative provisions provided by the social network, communities, or trusted partners (Lin, 1986; Li et al., 2015). Song et al. (2011) suggested that social support is highly related to social capital. To successfully compete in team-oriented gaming, the gamers have to supply necessary social support to help members defeat their opponents. Such support can help maintain intimate social networks and further foster social capital. Social support includes various aspects such as emotional support, information support, instrument support, and socializing support (Lin & Bhattacherjee, 2009). In additional, since social capital includes multiple dimensions (social ties, social trust, and shared goals), future research could propose a framework to clarify the complex relationships between social support and social capital.

Secondly, one of the common goals of MMORPGs gamers is the ongoing quest to level-up and see their characters progress through game play and interaction. When gamers possess higher skill levels, they obtain the abilities to engage in more difficult game activities. Higher skill levels also mean that gamers could contribute more to the team, as well as help team members attain shared goals (MacManus, 2012); therefore, self-efficacy vital in role-play and team-based games. Self-efficacy refers to one's belief in his or her own capabilities to perform a target behavior to accomplish a goal (Bandura, 1977; Hau & Kim, 2011; Kim et al., 2011). When gamers have greater self-efficacy for game play, they are likely to have greater confidence and abilities to participate in team activities and help other members to achieve the team goals, thereby strengthening the team's social capital. Consequently, self-efficacy may function as a determinant of social capital; hence, future research could the effect of self-efficacy on social capital.

The results of this present study have revealed that social capital could directly affect gamers' social needs satisfaction, which could further motivate gamers to remain loyal to a specific game. Moreover, gamers who express higher intention to comply in team norms also have greater game loyalty. It is hoped that the theoretical model and the practical results of this study may lead to a better understanding of the effects of social capital in the MMORPG context. Future research may consider additional predictors and extend the research framework of this study.

References

Ainuddin, R. A., Beamish, P. W., Hulland, J. S., & Rouse, M. J. (2007). Resource attributes and firm performance in international joint ventures. *Journal of World Business*, *42*(1), 47-60.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*(3), 411-423.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215.

Benedetti, (2012). *NBC News*. Retrieved September 2015 from, http://uschina.usc.edu/w_usct/showarticle.aspx?articleID=18392andAspxAutoDetectCookieSupport=1.

Blanchard, A. L., & Markus, M. L. (2004). The experienced sense of a virtual community: Characteristics and processes. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, *35*(1), 64-79.

Chin, W. W. (1988). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern Methods for Business Research* (pp. 295-337). Mahwah: Lawrence Erlbaul Associates.

Chin, W. W. (1998). Issues and opinion on structural equation modeling. *MIS Quarterly*, *22*(1), 7-16.

Chiu, C. M., Hsu, M. H., & Wang, E. T. (2006). Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems*, *42*(3), 1872-1888.

Chiu, C. M., Wang, E. T., Shih, F. J., & Fan, Y. W. (2011). Understanding knowledge sharing in virtual communities. *Online Information Review*, *35*(1), 134-153.

Cole, H., & Griffiths, M. D. (2007). Social interactions in massively multiplayer online role-playing gamers. *CyberPsychology and Behavior*, *10*(4), 575-583.

CTIMES (2015). *Asia Pacific Online Gaming Revenue will Reach $30B in 2018*. Retrieved December 2015 from, http://en.ctimes.com.tw/DispNews.asp?O=HJZ1C8L39IGSAA00NW.

Fehr, E., & Fischbacher, U. (2004). Social norms and human cooperation. *Trends in Cognitive Sciences*, *8*(4), 185-190.

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

Fowers, B. J. (2004). Theorizing marital quality: An examination of shared and internal goods. National Council on Family Relations Theory Construction and Research Methodology Conference, Orlando, FL.

Gefen, D., & Staub, D. (2005). A practical guide to factorial validity using PLS-graph: Tutorial and annotated example. *Communications of the Association for Information Systems*, *16*, 91-109.

Gefen, D., Straub, D.W., & Boudreau, M.C. (2000). Structural equation models and regression: Guidelines for research practice. *Communications of the Association for Information Systems*, *4*(7), 1-79.

Granovetter, M. S. (1973). The Strength of Weak Ties. *The American Journal of Sociology*, *78*(6), 1360-1380.

Han, C. C. (2014). Retrieved June 2014 from, http://www.find.org.tw/find/home.aspx?page=many&id=386

Hau, Y. S., & Kim, Y. G. (2011). Why would online gamers share their innovation-conducive knowledge in the online game user community? Integrating individual motivations and social capital perspectives. *Computers in Human Behavior*, *27*(2), 956-970.

Hsu, C. P., Chiang, C. Y., Chang, C. W., Huang, H. C., & Chen, C. C. (2015). Enhancing the commitment of nurses to the organization by means of trust and monetary reward. *Journal of Nursing Management*, *23*(5), 567-576.

Huang, S. C., Broniarczyk, S. M., Zhang, Y., & Beruchashvili, M. (2015). From close to distant: The dynamics of interpersonal relationships in shared

goal pursuit. *Journal of Consumer Research*, *41*(5), 1252-1266.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, *20*(2), 195-204.

Kim, H. W., Xu, Y., & Gupta, S. (2012). Which is more important in Internet shopping, perceived price or trust? *Electronic Commerce Research and Applications*, *11*(3), 241-252.

Kim, K. K., Shin, H. K., & Kim, B. (2011). The role of psychological traits and social factors in using new mobile communication services. *Electronic Commerce Research and Applications*, *10*(4), 408-417.

Koster, F., Stokman, F., Hodson, R., & Sanders, K. (2007). Solidarity through networks: The effects of task and informal interdependence on cooperation within teams. *Employee Relations*, *29*(2), 117-137.

League of Legends (2015). Retrieved December 2015 from, https://play.na.leagueoflegends.com/en_US?utm_expid=.l7BlzK2nQxKj5pW4bvoI6g.0&utm_referrer=https%3A%2F%2Fna.leagueoflegends.com%2Fen%2F

Li, X., Chen, W., & Popiel, P. (2015). What happens on Facebook stays on Facebook? The implications of Facebook interaction for perceived, receiving, and giving social support. *Computers in Human Behavior*, *51*, 106-113.

Lin, C. P. (2011). Assessing the mediating role of online social capital between social support and instant messaging usage. *Electronic Commerce Research and Applications*, *10*(1), 105-114.

Lin, C. P., & Bhattacherjee, A. (2009). Understanding online social support and its antecedents: A socio-cognitive model. *The Social Science Journal*, *46*(4), 724-737.

Lin, K. Y., & Lu, H. P. (2011). Intention to continue using Facebook fan pages from the perspective of social capital theory. *Cyberpsychology, Behavior, and Social Networking*, *14*(10), 565-570.

Lin, N. (1986). Conceptualizing social support. In N. Lin, A. Dean, and W. Ensel (Eds.), *Social Support, Life Events, and Depression* (pp. 17-30). New York: Academic Press.

MacManus, C. (2012). *League of Legends the world's 'most played video game'.* Retrieved October 2015 from, http://www.cnet.com/news/league-of-legends-the-worlds-most-played-video-game/#!

MMO Worlds (2015). *What is a Massively Multiplayer Online Role-Playing Game*? Retrieved December 2015 from, http://na.leagueoflegends.com/

Molyneux, L., Vasudevan, K., & Zúñiga, H. G. de (2015). Gaming social capital: Exploring civic value in multiplayer video games. *Journal of Computer-Mediated Communication*, *20*(4), 381-399.

Nagygyörgy, K., Urbán, R., Farkas, J., Griffiths, M. D., Zilahy, D., Kökönyei, G. & Demetrovics, Z. (2013). Typology and sociodemographic characteristics of massively multiplayer online game players. *International Journal of Human-Computer Interaction*, *29*(3), 192-200.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital and the organizational advantage. *Academy of Management Review*, *23*(2), 242-266.

Nambisan, S., & Baron, R. A. (2009). Virtual customer environments: Testing a model of voluntary participation in value co-creation activities. *Journal of Product Innovation Management*, *26*(4), 388-406.

Neys, J. L., Jansz, J., & Tan, E. S. (2014). Exploring persistence in gaming: The role of self-determination and social identity. *Computers in Human Behavior*, *37*, 196-209.

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, *5*(1), 14-37.

Oliver, R. L. (1997). *Satisfaction: A Behavioral Perspective on the Customer*. New York: McGraw-Hill

Ommundsen, Y., Roberts, G. C., Lemyre, P. N., & Miller, B. W. (2005). Peer relationships in adolescent competitive soccer: Associations to perceived motivational climate, achievement goals and perfectionism. *Journal of Sports Sciences*, *23*(9), 977-989.

Pavlou, P. A. & Chai, L. (2002). What drives electronic commerce across cultures? Across-cultural empirical investigation of the theory of planned behavior. *Journal of Electronic Commerce Research*, *3*(4), 240-253.

Pillutla, M. M., & Chen, X. P. (1999). Social norms and cooperation in social dilemmas: The effects of context and feedback. *Organizational Behavior and Human Decision Processes*, *78*(2), 81-103.

Reer, F. & Krämer, N. C. (2014). Underlying factors of social capital acquisition in the context of online-gaming: Comparing World of Warcraft and Counter-Strike. *Computers in Human Behavior*, *36*, 179-189.

Riedl, C., Köbler, F., Goswami, S., & Krcmar, H. (2013). Tweeting to feel connected: A model for social connectedness in online social networks. *International Journal of Human-Computer Interaction*, *29*(10), 670-687.

Ringle, C. M., Wende, S., & Will, A. (2005). *SmartPLS 2.0 M3 (beta)*. Hamburg: ww.smartpls.de

Song, L., Son, J., & Lin, N. (2011). Social support. In J. Scott and P. J. Carrington (Eds.), *The SAGE Handbook of Social Network Analyses* (pp. 116-128). London, UK: SAGE Publications Ltd.

Statista (2015). *Most played PC games on gaming platform Raptr in May 2015, by share of playing time*. Retrieved December 2015 from, http://www.statista.com/statistics/251222/most-played-pc-games/.

Szymanski, D. M., & Henard, D. H. (2001). Customer satisfaction: A meta-analysis of the empirical evidence. *Journal of the Academy of Marketing Science*, *29*(1), 16-35.

Teng, C. I., & Chen, W. W. (2014). Team participation and online gamer loyalty. *Electronic Commerce Research and Applications*, *13*(1), 24-31.

Trepte, S., Reinecke, L., & Juechems, K. (2012). The social side of gaming: How playing online computer games creates online and offline social support. *Computers in Human Behavior*, *28*(3), 832-839.

Tseng, F. C., Huang, H. C. & Teng, C. I. (2015). How do online game communities retain gamers? Social presence and social capital perspectives. *Journal of Computer-Mediated Communication*, *20*(6), 601-614.

Wang, J. C., & Chang, C. H. (2013). How online social ties and product-related risks influence purchase intentions: A Facebook experiment. *Electronic Commerce Research and Applications*, *12*(5), 337-346.

Ward, A., & Smith, J. (2004). *Trust and Mistrust: Radical risk strategies in business relationships*. John Wiley and Sons.

Yahoo Kimo (2017). 2017 Yahoo Kimo computer game survey – the profile of Taiwan gamers. Retrieved December 2018 from, https://drive.google.com/file/d/0BwlKufznZS4IZzU1cElXVXAwLXc/view

Yee, N. (2006). Motivations for play in online games. *CyberPsychology and Behavior*, *9*(6), 772-775.

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