



Segmenting online gamers by motivation

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ABSTRACT

Online games are becoming one of the most profitable online entertainment businesses. Nevertheless, online game players may have diverse motivations for playing online games, which in turn influence their behaviors and preferences in playing online games. Through factor analysis for dimensionality reduction, this study identifies two underlying motivational factors: (1) the need for exploration, and (2) the need for aggression. From these two factors, this study clusters online gamers into three segments: (1) the aggressive gamers, (2) the social gamers, and (3) the inactive gamers. The aggressive gamers score highest on both factors. The social gamers score high on the first factor, but score lowest on the second factor. The inactive gamers score lowest on the first factor, and score in the middle on the second factor. Significant differences exist in consumer behaviors across different segments of online gamers. Theoretical supports for the two motivational factors are discussed, and managerial implications for online game service firms are provided.

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1. Introduction

With the advancement of multimedia technologies and the wide access of broadband Internet, online games are becoming one important online entertainment business (Koo, 2009; Nojima, 2007; Williams, Yee, & Caplan, 2008). Actually, the worldwide market size of online games reached US\$ 8.6 billion in 2007, and it is predicted that, in the future 4–5 years, the global market of online games will keep on a double-digit growth and it will hit US\$19.1 billion by 2011 (Zhao, 2008). At the same time, online game service firms have developed two major revenue models (Lin & Sun, 2007; Nojima, 2007): (1) subscription fees: gamers have to pay (monthly) subscription fees to the game service provider for playing online games, and (2) the sale of virtual items: gamers do not have to pay subscription fees. The revenue mainly comes from the selling of virtual assets or equipments to gamers.

As more and more people play online games, their motivations for playing online games are becoming more diverse. Being able to articulate these motives provides the foundation to investigate how different segments of online gamers are motivated differently, and how these motivations are correlated with usage pattern in playing online games.

Although previous research has extensively studied online gamers' motivations and proposed various frameworks for the motivations for playing online games (e.g., Chou & Ting, 2003; Hsu & Lu, 2007; Wan & Chiou, 2006; Yee, 2006a, 2006b), the focus was on individual levels rather than on market segments. To fill in this

void of knowledge, this study groups online gamers based on their motivations with an aim to investigate the differences among different motivational segments in usage patterns and responses to marketing offerings in online games. Thus, the research results will become more actionable for online game service providers to take different strategies for different market segments.

2. Online gamers' motivations for playing online games

Basing on interviews with online gamers and related literature (Chou & Ting, 2003; Wan & Chiou, 2006; Yee, 2006a, 2006b), a questionnaire was developed for an online survey. The questionnaire contains 15 items on the motivations for playing online games, with response on a scale ranging from 1 (strongly disagree) to 7 (strongly agree), and 14 items on demographic data and behaviors concerning online games with categorical scale. This study collected 228 valid responses from online gamer in Taiwan. Among these 228 participants, 57.9% were male, and 132 (57.39%) are females. 138 (60.5%) are aged between 20 and 30. 129 (56.6%) gamers have collegiate degrees or higher.

Exploratory factor analysis (EFA) (Hair, Black, Babin, Anderson, & Tatham, 2006) was conducted on the 15 items regarding motivations for playing online games. This serves two purposes. First, it can be used for dimensionality reduction (Han & Kamber, 2006). With factor analysis, the 15 items (dimensions) can be reduced to a smaller number of factors. Second, it can uncover the latent (unobservable) motivational factors. That is, these 15 items are directly observable indicators for the unobservable factors (Sharma, 1996). Using an eigenvalue greater than 1.0 as a selection criterion, two factors emerged as shown in Table 1. These two factors are:

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Table 1
Factors analysis of the motivations for playing online games.

Factors	Motive items	Factor loadings
Factor 1: the need for exploration (Eigenvalue = 7.729) (Cronbach's α = 0.963) (Cumulative percent of variance = 51.52%)	(4) I wish my character amassed a lot of money or items in online games	.904
	(2) It is important to enhance the power of my character in the game	.892
	(1) It is important that my character looks different from other characters	.868
	(3) It is important that my character is as optimized as supported by the game	.857
	(7) I enjoy solve missions that are unknown to most gamers	.824
	(5) I enjoy exploring locations that are unknown to most gamers	.819
	(6) I enjoy experiencing quests that most gamers do not know about	.815
	(8) I enjoy chatting with other gamers	.797
	(9) I would rather be grouped than soloing in the game	.763
	(10) In online games, the most important thing is getting to know other gamers	.737
	(11) I am glad to cooperate with others in a group	.731
Factor 2: the need for aggression (Eigenvalue = 3.810) (Cronbach's α = 0.935) (Cumulative percent of variance = 76.92%)	(13) It makes me delighted to kill other gamers' characters	.932
	(14) In online games, the most important thing is to conquer other gamers	.930
	(15) It makes me happy to see other gamers' failures	.921
	(12) It makes me excited to see the killings in the game	.715

- (1) The need for exploration: exploring the extremes of the games, exploring new maps or frontiers in the games, explore different identities and future selves for new friendship in the games.
- (2) The need for aggression: killing the characters of other gamers, winning over other gamers, and so on.

These two motivational factors cumulatively accounted for 76.9% of the total variance, and the factor loadings for the 15 items all exceed 0.7, meaning significant correlation between these 15 items and the two factors (Hair et al., 2006). To check the reliability of the two factors, Cronbach's α coefficient for each factor was calculated. The results (0.963 and 0.935, respectively) showed that each factor scale had satisfactory consistency (Hair et al., 2006).

3. Theoretical implications

There are theoretical supports for these two factors underlying online gamers' motivations for playing online games. Regarding the first factor (i.e., the need for exploration), consumer behavior research (e.g., Menon & Kahn, 1995; Raju, 1980) has claimed the presence of Optimum Stimulation Level (OSL). When the stimuli from the environment fall under an individual's OSL, he/she will be satiated and this satiation results in a higher intrapersonal drive for novelty, complexity, variety, or change. Therefore, the need for exploration is linked to the concept of OSL. In online games, gamers can explore new maps or zones, and try to solve novel missions. Hence, online games can fulfill exploration motivation for gamers.

Researchers have identified the need for exploration in playing online games, with various terms. For example, Chou and Ting (2003) included *exploratory behavior* as one component of flow experience in playing online games. Koo, Lee, and Chang (2007) proposed *epistemic curiosity* as one of the experiential motives for playing online games. Wan and Chiou (2006) indicated the *need for excitement and challenge* (i.e., sensation seeking) is one of the reasons for online game addiction. Yee (2006a) discovered the motivational factor *discovery*, which represents the motivation to explore the virtual world in online games. In addition, Gross (2004) argued that the Internet provides a platform for adolescents to explore different identities and future selves. In online games, especially role-playing games (RPGs), gamers can explore various roles to perform various tasks and experience various interpersonal relationships. Thus online games can meet the need of identity exploration for gamers.

With respect to the second factor (i.e., the need for aggression), Murry (1938) proposed a theory of personality with a repository of 28 psychogenic needs. One of them is *the need for aggression*

(*n aggression*), which is the need to assault or injury an object. Or the needs to murder, belittle, harm, punish severely, or maliciously ridicule a person. In real world, it is hard to satisfy this need. In the virtual world of online games, however, gamers can easily satisfy this kind of need through virtual characters. In studying online gamers' motivations for playing online games, Yee (2006a) partially identified the need for aggression by proposing a motivational factor called *competition*, which represents the desire to challenge, provoke, or dominate other players. Yee (2006b) also proposed one related motivational factor called *manipulation*, and observed that gamers who score high on the manipulation factor enjoy deceiving, defrauding, taunting and dominating other gamers. Wan and Chiou (2006) also indicated one motivation for playing online games; that is, emotional coping, which included releasing stress, relaxation, discharging anger and frustration.

4. Segmenting online gamers based on the two motivational factors

K-means clustering analysis was used to segment online gamers based on the two factors of the motivations for playing online games. One important issue of K-means clustering is to determine the number of clusters. For this issue we adopted Ray and Turi's (1999) proposed solution, as described below:

Step 1: define the *intra-cluster distance* as

$$\text{intra} = \frac{1}{N} \sum_{i=1}^K \sum_{x \in C_i} \|x - z_i\|^2,$$

where N is the number of samples, K is the number of clusters, and z_i is the center of cluster C_i .

Step 2: define the *inter-cluster distance* as

$$\text{inter} = \min(\|z_i - z_j\|^2), \quad i = 1, 2, \dots, K - 1 \\ j = i + 1, \dots, K,$$

where z_i is the center of cluster C_i and z_j is the center of cluster C_j .
Step 3: define the validity of the clustering result with K clusters as

$$\text{validity} = \frac{\text{intra}}{\text{inter}}$$

Step 4: from a range of possible values for K , choose the clustering which gives a **minimum** value for the validity measure as the ideal value of K in the K-means procedure.

Following the above steps, this study tried the values of K from 2 to 7, with the results shown in Table 2.

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