Motivation-Behavior Relations: An empirical analysis for playing experience on social network games

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***Abstract*--This paper is aimed at analyzing the behaviors of Social Network Services (SNSs) game users in relation to community-targeting Social Network Games (SNGs), and the motivations that give rise to those behaviors. Previous research has focused on the study and utilization of game production technologies, rarely dealing with motivations of game users. Generally, this research has been limited to observations of user behavior in relation to achieving certain goals or themes of a game, such as upgrading a character's level or obtaining rewards. Rather than analyzing SNS game user behavior simply from this problem-solving perspective, this paper considers a wider variety of human motivations.**

In order to accomplish this goal, this paper first analyzes the motivation theory of SNS users and Lazzaro's 'People Fun' model. Next, experimental data collected from users playing 13 different SNGs is presented and classified by game events and functional actions. Finally, based on these results, the primary behaviors of SNG users will be generalized into 8 different types and distinct motivation–behavior patterns will be analyzed.

I. INTRODUCTION

Social Network Games (SNGs), emphasizing communities of users in virtualized world using Social Network Services (SNSs), have the purpose of providing various experiences, enjoyment, and information sharing. The increasing number of communication methods has rapidly expanded the means of player interaction and game participation [1].

Contrary to the goals of general application software, which are more focused on functional task completion, games emphasize the importance of providing users with emotional elements such as fun, accomplishment, and adventure. However, current research [2-4] on game players mainly focuses on analyzing the behavior patterns of players based on functional problem solving methods. While this type of research is useful in preparing a foundation for analysis by classifying cognitive behavior in relation to the activities of playing a game, it still stresses the sense of accomplishment from completing functional tasks, rather than focusing on the fun elements – one of key attributes of games.

Consequently, the primary goals of this study include amusement, satisfaction, and the formation of social bonding that can be achieved through mutual relations (cooperation, competition, and support) among players [5]. These interactive elements contribute to the formation of the rules of playing SNGs, and determine the behavior of players. Therefore, the intention of this study is to provide a solid basis for designing the fun elements of a SNG, by classifying the types of player behavior in building a community, which is one of the main objectives of playing a SNG. This has not been attempted in previous research.

Lazzaro categorized the fun of a game into four general areas, and explained the interactions of game play and relevant emotions incurred in each area [6]. While Lazzaro has provided a macroscopic perspective of the four areas, little has been presented in the form of empirical experiments. Hence, this study is aimed at examining through experiments the player behaviors presented in Lazzaro's 'People Fun' model, and defining the relations between motivation and behavior of SNG players based on the theory of 'user motivation' [7, 8] for social networks. While general conclusions are presented based on the experiment results, further studies are recommended to confirm and strengthen the conclusions.

II. STANDARD ELEMENTS

A. *'People Fun' Model of Lazzaro*

Lazzaro categorizes the types of fun obtained while playing a game as hard fun, easy fun, people fun, and serious fun, as shown in Figure 2-1. The behavior and attitudinal patterns have also been classified in accordance with those types [9].

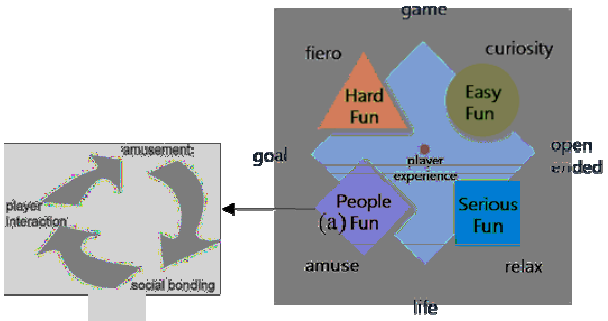

Fig. 2-1. Four types of fun on the right side and the structure of people fun according to Lazzaro is on the left.

The left side of Figure 2-1 indicates that various social interactions from playing games create various positive emotions, which in turn encourage social bonding and further interaction in a circular relationship. This sort of macroscopic structure contributes to the generation of various kinds of selective behaviors and emotions of players, as shown in Table 2-1.

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Lazzaro explained that the emotions generated in the people fun model develop from various kinds of behavior in social interactions. Lazzaro presented sixteen types of selective behavior and thirteen kinds of emotions generated from these behaviors. In order to validate this model, evidence must be obtained from case studies of users playing actual SNGs.

TABLE 2-1. PLAYER EXPERIENCE PROFILE OF PEOPLE FUN MODEL.

Behaviors	Emotions
-cooperate -compete -communicate -mentor -lead -perform -spectacle -characters -personalize -open expression -jokes -house rules -secret meanings -pets -endorsements -chat	-amusement -social bonding -schadenfreude -naches -envy -love -gratitude -generosity -elevation -inspire -excite -ridicule -embarrass

B. Motivation Theory about SNS

The key fun element of a SNG is that it is built upon a social network. While it is true that some social networking functions has been utilized in other game genres, such as MMORPGs, in those cases it is hardly a key element of the game. Therefore, the fun function of social networks is very distinct from the sense of achievement obtained by simply completing missions assigned within the scope of a game. In other words, the concept of motivations, such as those relating to the social structure of the real world, has to be applied, and identifying player behaviors based on specific motivations is required in designing a SNG.

With respect to research on social networks, Yochai Benkler (2006) defined four elements that motivate people to use a social medium: social connectedness, psychological well-being, gratification, and material gain [8]. In addition, Peter Kollock (1999) outlined the four motivations people have in contributing to and participating in an online community: reciprocity, reputation, increased sense of efficacy, and attachment to and need of a group [7]. These motivations have become a device that encourages certain behaviors in people participating in a social network. In this study, the motivations presented by Yochai Benkler will be defined as the primary motivations with respect to 'accessibility' that can be the starting point of using a medium. The motivations explained by Peter Kollock will be utilized as secondary motivations that are more focused on the 'outcomes' from playing specific games. Figure 2-2 shows some example connection patterns between the primary and secondary motivations for each behavior; experimental results will be used to determine actual connections.

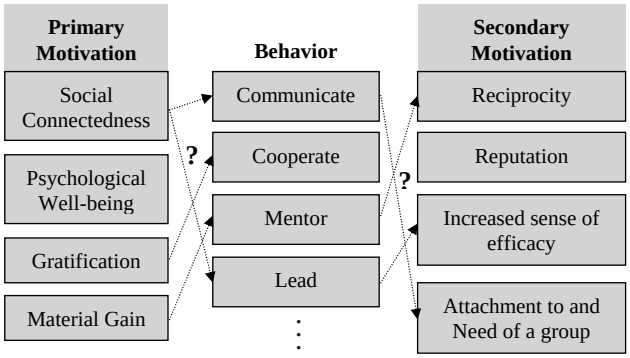


Fig. 2-2. Motivation theory and SNG players' behavior structure

III. ANALYSIS OF THE BEHAVIORAL STRUCTURE OF SNG PLAYERS

With the primary motivations representing the accessibility of players to carry out certain events, the interactions among players represents the selected behaviors in this analysis. In turn, the behaviors cause the generation of the secondary motivations and the emotions caused by a specific event at the same time. Therefore, this study will analyze the relationship between the motivations and behaviors of SNG players through case studies.

Thirteen games presented by 'Facebook', which has the largest number of SNG players in the world, were selected as the objects of analysis. Each has more than ten million monthly active users [10].

A total of ten undergraduate students, all studying games at university and experienced in playing SNGs, were requested to play the thirteen games for one month, and then asked to submit two reports. These reports were be used to classify the behaviors and analyze the structure of the associative relations of the subjects, presented below. In this experiment, the retrospective protocol was adopted because a certain level of game experience was required, to be accurate higher than 10 levels. The first reports were used to construct common selective behaviors, by examining the types and contents of behaviors actually found in the thirteen object games based on the sixteen types of Lazzaro's selective behaviors. Next, the second reports were used to generate data by mapping the associative relationship with the player motivations (according to the selective behavior types found in the first report), in order to discover the patterns of each motivation and behavior structure.

A. Classification of the players' behaviors in each analyzed game

The result of the first report (Table 3-1) indicates that the types of player behaviors in each game genre are similar. This table provides the number of behavior types and the kinds of behavior that are common for all titles in each genre.

TABLE 3-1 THE TYPE OF BEHAVIORS OF SUBJECTS TOWARD THE ANALYZED OBJECTS

Genre	Titles	Number of Behavior Types	Common Behaviors
Manage / Simulation	FarmVille	9	perform lead compete pets cooperate spectacle
	FrontierVille	8	
	Café World	8	
	Treasure Isle	8	
	Zoo World	8	
	Restaurant City	10	
Arcade	Texas HoldEm Poker	6	lead compete communicate cooperate
	MindJolt Games	4	
	Bejeweled Blitz	6	
Cultivability	PetVille	7	characters perform lead pets cooperate spectacle
	Pet Society	7	
	Happy Aquarium	8	
Role Playing	Mafia Wars	7	characters perform lead compete spectacle communicate cooperate

B. Motivation – behavior structure of SNG players

In order to map the associative relationship between the players and motivations based on the eight common behaviors indicated in Table 3-1, the data of the motivation–behavior structure of ten subjects were collected through the second report. The leading motivation–behavior patterns of the eight behaviors have been summarized below (See Fig. 3-1 ~ 3-8).

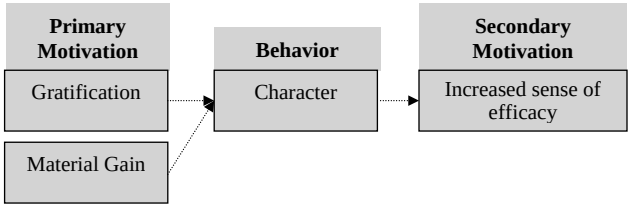


Fig. 3-1 Character: motivation-behavior pattern (a)

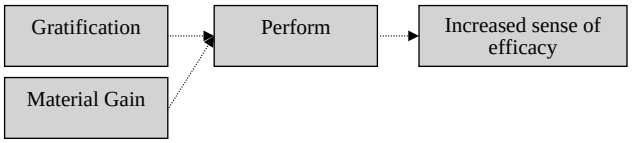


Fig. 3-2 Perform: motivation-behavior pattern (b)

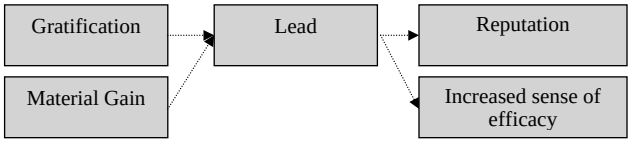


Fig. 3-3 Lead: motivation-behavior pattern (c)

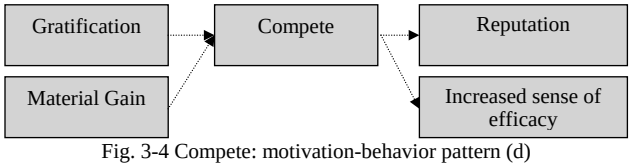


Fig. 3-4 Compete: motivation-behavior pattern (d)

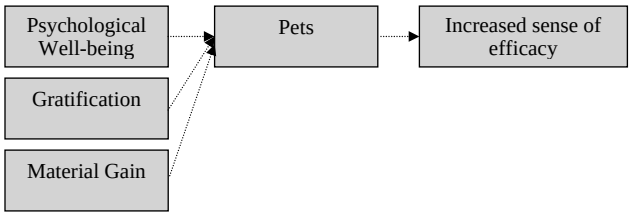


Fig. 3-5 Pets: motivation-behavior pattern (e)

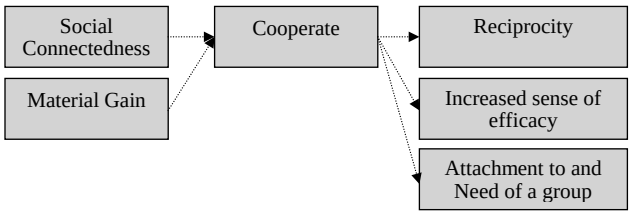
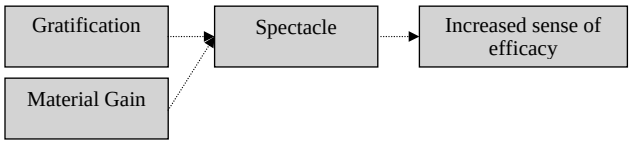
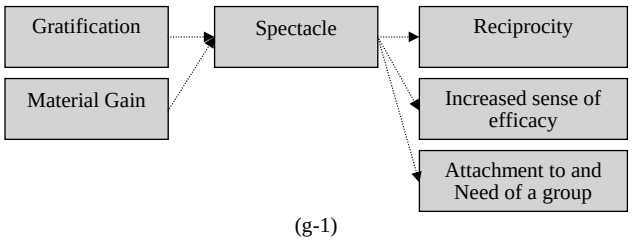


Fig. 3-6 Cooperate: motivation-behavior pattern (f)

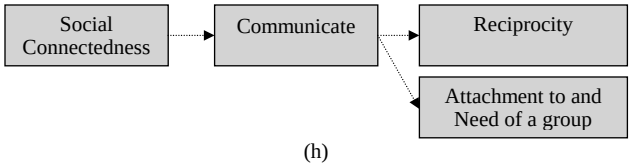


(g)

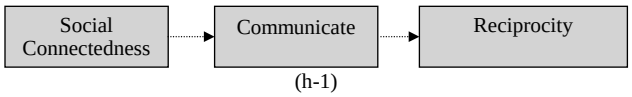


(g-1)

Fig. 3-7 Spectacle: motivation-behavior pattern



(h)



(h-1)

Fig. 3-8 Communicate: motivation-behavior pattern

As shown in Table 3-2, the motivation–behavior patterns have been divided into mainstream and non-mainstream based on the most common motivation–behavior patterns in each genre. According to the result of this analysis, first, when both character and perform behaviors existed in analytic games, every player revealed the mainstream motivation–behavior pattern (a, b), and both patterns are equivalent. In particular, the character behavior is considered to be the main behavior in business management, nurturing, and RPG genres, but not the

arcade genre. Secondly, in case of the competitive behavior, there was one mainstream pattern (d), and three non-mainstream patterns (d', d'', d'''). The non-mainstream patterns were found in the arcade game genre only. From this, it was determined that even the same behavior can give rise to different motivations for users, depending on the features of the particular genre. Thirdly, the spectacle and communicate behaviors showed two mainstream patterns (g, g-1, h and h-1). For both behaviors, non-mainstream patterns appeared only in the nurturing game genre. The non-mainstream patterns in the nurturing game genre were found in mini-games (g' and g'') that a player played alone, and in competition with other players for the purpose of achieving physical benefits (h').

TABLE 3-2 CLASSIFICATION OF MOTIVATION – BEHAVIOR PATTERNS OF SNG PLAYERS

Motivation-Behavior Patterns		Manage / Simulation	Arcade	Culti-vability	Role Playing	Proportion (%)
Main Pattern	a	50/50	0/0	30/30	10/10	100
	b	60/60	20/20	30/30	10/10	100
	c	57/60	24/30	28/30	9/10	91
	d	60/60	6/30	20/20	10/10	80
	e	48/50	2/10	27/30	0/0	86
	f	52/60	12/30	27/30	2/10	72
	g	43/60	2/10	0/30	4/10	45
	g-1	17/60	8/10	7/30	6/10	34
	h	7/10	18/30	8/20	2/10	50
	h-1	3/10	12/30	0/20	8/10	33
Non-Main Pattern	c'	3/60	6/30	2/30	1/10	9
	d'	0/60	9/30	0/20	0/10	8
	d''	0/60	8/30	0/20	0/10	7
	d'''	0/60	7/30	0/20	0/10	5
	e'	2/50	8/10	3/30	0/0	14
	f'	8/60	18/30	3/30	8/10	28
	g'	0/60	0/10	11/30	0/10	10
	g''	0/60	0/10	12/30	0/10	11
	h'	0/10	0/30	12/20	0/10	17

IV. CONCLUSION

The goal of this study was to produce the experimental results to analyze:

- what types of motivation influence the behaviors of the players of community-building SNGs, and
- the relationship between these motivations and behaviors based on people fun theory and the motivation theory based on users of SNSs.

This analysis used data collected from reports containing the experiences of ten subjects who played thirteen SNGs. A total of eight types of common user behaviors among the sixteen types of user behaviors presented by Lazzaro and motivation–behavior patterns (ten mainstream and nine non-mainstream kinds) were identified by the experiment. In short, both the conceptual idea of Lazzaro, and the behaviors and contents that have actually been applied to SNGs, have been evidenced through the experiment.

The mainstream patterns revealed by this experiment will be useful information in the initial stage of designing a SNG. In addition, it can be verified that the mainstream and non-mainstream patterns of motivation–behavior structure are different according to the characteristics of the game genre concerned. Accordingly, since the same behaviors can nevertheless result from different motivations depending on game genre, the fun elements given to users can be varied. These results can be utilized to determine whether or not a specific motivation–behavior pattern will be used, and how much is applicable to a specific game genre.

Since the conclusions in this study are based on a limited sample experiment, further studies are recommended with larger, more diverse groups of SNG players. In addition, the scope of this study is limited to the positive results of behavior in the experiment. Future studies will cover modeling SNG players for their motivation–behavior–emotions, i.e. including the emotional elements of users in the results of behaviors. These studies can provide the basis for designing gameplay with community features.

REFERENCES

[1] Kim, Taegyu, Rye, Seucho, “Study on Social Function Factor in SNG-reward of Run Away”, Journal of Korean Society for Computer Games, Vol. 21, No. 1, pp. 185-191, 2010.

[2] Kavakli & Thorne, “A Cognitive Modelling Approach to Capturing the Context of Complex Behavior in Gameplay”, proceeding of the first international conference on Information Technology & Applications (ICITA), 2002.

[3] M. Kavakli and J. S. Gero, “Macroscopic Analysis of Design Processes based on a Scheme for Coding Designer’s Cognitive Actions” Design Studies, Vol. 19, No. 4, pp.455-483, 2002.

[4] Song, Seunkeun, Kim, Mijin, “The Protocol Anlaysis for Gameplay Behavior Pattern in MMO Game”, Journal of Korean Society of Design Science, Vol.79, No.5, 2008.

[5] Aki Järvinen, "Game Design for Social Networks: Interaction Design for Playful Dispositions", IT University of Copenhagen, Denmark, retrieved by http://mygamestudies.com

[6] Lazzaro, N., “Why We Play Games: Four Keys to More Emotion in Player Experiences”, proceedings of GDC, 2005.

[7] Kollock, Peter, "The Economies of Online Cooperation: Gifts and Public Goods in Cyberspace," in Communities in Cyberspace. Marc Smith and Peter Kollock (editors). London: Routledge, 1999.

[8] Benkler, Y., "The Wealth of Networks", Yale University Press, 2006.

[9] Katherine Isbister, Noah Schaffer,"GAME USABILITY: Advice form the Experts for Advancing the Player Experience", Morgan Kaufmann Publishers, 338-343, 2008.

[10] AppData, Facebook Application Leader Board , retrieved by http://www.appdata.com

[11] Van Someren, et al., The Think Aloud Method: A practical guide to modelling cognitive processes, Academic Press, 1994.

[12] Zynga, Zynga Games, http://www.zynga.com

[13] MindJolt, MindJolt Games, http://www.mindjolt.com

[14] Electronic Arts, EA Games, http://www.ea.com

[15] Popcap Games, http://www.popcap.com

[16] CrowdStar, http://www.crowdstar.com

[17] RockYou, http://www.rockyou.com