Systematic Analysis of In-game Purchases and Social Features of Mobile Social Games in Japan[1]

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ABSTRACT

The mobile social game market is expanding rapidly. Thirty-one popular mobile social games selected by young people (N = 2,660) in Japan during November 2013 were analyzed. The results showed that players could make additional in-game purchases after starting to play 30 of the 31 games. Moreover, limited-time events allowing additional in-game purchases were available in 90% of the games. Results also indicated that not only competitive but also cooperative features are prevalent in social games, and connections to social networking services are recommended in more than 80% of the games.

Keywords

Smartphones, Social Features, In-game Purchases, Social Games, Systematic Analysis, Mobile Device

INTRODUCTION

The market for mobile social games is growing rapidly in Asia. In Japan as of 2013, the size of the market for mobile social games was 711 billion yen (approximately 7.1 billion USD[2]); this includes the market for smartphone game apps, which was 316 billion yen (Computer Entertainment Supplier's Association, CESA, 2014). Mobile social games often adapt the freemium, or free-to-play model, in which players can start playing games free of charge and then are provided chances to obtain useful game items through monetary purchases. Such in-game purchases are not new to the game industry (e.g., Nojima, 2008; Paavilainen et al., 2013); however, the rapid expansion of mobile phones and smartphones, as well as mobile social games among teenagers has caused social problems in Japan (Inoue, 2012ab; Shin, 2012)..

One reason for the rapid expansion of these social games is the mobility feature, which makes it possible for players to play such games even for short time periods while

engaging in other activities such as multitasking, riding on a train, eating lunch, watching TV, or getting ready for bed. This type of ubiquitous availability can lead individuals to play these games more frequently. On the other hand, players can shorten their playing time if they choose not to pay additional money. Some studies have focused on players' motivations in playing social games, and have examined business models of social games (e.g., Arai, 2013; Teramoto, Shibuya, & Akimoto, 2014; Yamamoto, 2014). However, little research has been conducted on the monetary context and social features of these games. Therefore, this study empirically investigated the monetary context and social features of mobile social games.

Characteristics of Mobile Social Games in Japan

Social games in the Japanese setting have been narrowly defined as games played within a social networking service (SNS), such as GREE, Mobage (SNS operated by DeNA), Ameba (SNS operated by Cyber Agent) and Facebook. This narrow definition of social games usually refers to games based on web browsers that are found in SNSs (CESA, 2014). However, with the recent rapid development of game applications (apps), social games and game apps in smartphones are also often regarded as "social game apps" (Enterbain, 2014), or "*soshage*" (a shortened combination of the Japanese pronunciation of the words 'social' and 'game'). The term "online games" has previously been used in terms of network games played on PC. However, partly due to the rapid growth of the mobile market, the definition of online games has expanded to include mobile online games. Therefore, the division between social games and online games has become blurred. In this study, social games refer to mobile social games, including game apps and native apps in mobile phones and smartphones.

The game experience has been discussed in terms of player perspectives regarding uses and gratification, motivation, and flow (e.g., Greenberg et al., 2010; Sherry, 2004; Yee, 2006). Other research has used content analyses, focusing on the violent content and gender representations in some games (e.g., Smith et al., 2003; Williams et al., 2009). However, traditional methods of content analysis do not necessarily reflect interactive and online features of game experience (Schmierbach, 2009). As a result, there is a need for such studies to reflect the possibility that the content of games can vary according to players as well as when and how long a game is played.

Recently, Elson et al. (2014) explained the game experience using three components: narrative, mechanics, and context. The present study focuses on elements of the mechanics, which can be seen as rules of play. Social features of game mechanics affect the real and online social contexts of game players, and vice versa. Mobile social games are usually based on online services and their content can change based upon the amount of time the game is played and the choices made by players. Moreover, the mechanics of online services are subject to change by game publishers and developers.

A project team consisting of industry and academic leaders in Japan has summarized social game mechanics as a business model with the following features: (1) Games are basically free of charge, (2) They are easy to play at outset (e.g., gaming skills are not usually required), (3) Players can expand play by making in-game purchases, (4) Retention and satisfaction of players is expected through creation of a community or social networking, (4) Game publishers can keep players active by planning events, (5) Game publishers can analyze player data to improve satisfaction and retention (Mitsubishi Research Institute, 2013). Nojima (2011) also described three stages of social game services: *hook* (providing a chance to play), *retention* (keeping players playing

continuously) and *monetization*, (motivating players to pay for game features). Among these features of social games, we focused on monetary features, especially in-game purchases, the "*gacha*" system, event features, and social features.

Monetary Features of Games

Mobile social games often use the freemium model, a term coined by Anderson (2009) that combines the words "free" and "premium." Unlike packaged games, players can start playing these games free of charge. However, players are given chances to purchase items useful for continued play such as stamina-restoring drinks, powerful weapons, and attractive costumes, using real money (or coins used in SNSs, which correspond to real money).

Players can also use *gacha*, which are similar in screen appearance to vending machines that dispense children's toys, and lucky players can win valuable gaming items this way. *Gacha* is onomatopoeia that imitates the sound of a crank on a toy vending machine. *Gacha* can be played for free, however, extremely rare and/or valuable gaming items can also be obtained through monetary purchases of online *gacha* products. Unlike gambling, players cannot obtain real money as a reward within the context of games. However, the perception of obtaining rare and special items, such as strong weapons or cards from *gacha* can be similar to that of gaining large monetary rewards in gambling. Moreover, it is possible for players to seek the sensation of a "big win" by paying increasingly greater amounts of money. Therefore, *gacha* can be similar to gambling or roulette as it represents a lottery within the context of the game, and it is often referred as simulated-gambling. We use the phrase *gacha* throughout this study because *gacha* (or *gachagacha*, *gachapon*) are common in Japan in places such as toy stores and supermarkets, and children use real money, usually 100 to 500 yen, to get toys from these *gacha* machines.

The so-called "*kompu gacha*," (an abbreviation of "complete *gacha*,") is a type of *gacha* in which players are provided chances to obtain especially rare and valuable items by collecting complete sets of cards, items with different marks, or numbers. *Kompu gacha* was seen as a source of social problems and have been criticized in media reports and by the Consumer Affairs Agency in 2012, in part because the activity was seen as similar to gambling and in part because some players earned real money by trading valuable cards (Consumer Affairs Agency, Government of Japan, 2012; Inoue, 2012a; Shin, 2012). As a result of the criticism by the Consumer Affairs Agency, major social game platforms and developers decided to restrict *kompu gacha*. The mobile game industry in Japan also started to set monetary limits less than or equal to 5,000 yen (approximately 50 USD) that could be spent by players aged 15 or younger, and 10,000 yen (approximately 100 USD) for players aged 18 or younger. Mobile console companies and consumer agencies also recommended that parents discuss the game system with their children, set passwords, and not link any credit cards or phone bills to the games (Inoue, 2012b; National Consumer Affairs Center of Japan, NCAC, 2013, 2014).

In addition to the in-game purchases and *gacha* discussed above, this study also focused on features of limited-time events. These types of events are of interest because they can motivate players to pay large amounts of money during the limited time frames in order to obtain rare and valuable items or cards ("Men who continue," 2013; Inoue, 2012ab). For example, *Puzzle and Dragons* (Gunho Online Entertainment, 2012), one of the most popular mobile games in Japan, has several different *gacha*, including special *gacha* (e.g., a rare egg machine) in which special stones, called Magic Stones, are required. In this game, for limited-times (e.g., during GodFes), players can obtain rare, valuable characters.

Although players can collect Magic Stones through other means (e.g., logging in the game every day, or completing a series of adventures), players are able to continue playing *gacha* until they obtain the characters they want through monetary purchases (Gunho Online Entertainment, 2013; Puzzle & Dragons Ultimate Strategy DB, 2012). This game also set monetary limits for minors up to 20,000 yen per month or 5,000 yen for 15 years old or younger, and also requests that minors obtain permission of parents or guardians. This type of limited-time *gacha* has frequently been found in other games, and the degree of its availability and psychological effects remain unknown.

After the problems related to social games in 2012 and subsequent criticism, the number of consulting cases regarding these games has decreased, but the number of consulting cases involving minors has not declined, partly because of the expansion of smartphones and the attraction of social games for young individuals (NCAC, 2013, 2014). According to a survey conducted by CESA in 2013, teenagers, aged 15-19 were the most frequent mobile social game players among all age groups (CESA, 2014). The limits imposed on the amount of money that can be used by minors have helped to minimize problems related to in-game purchases. Nevertheless, the freemium model has remained opaque; it is improperly understood and has not gained acceptance in society in general, and it is even less accepted within the game industry and among players. Therefore, empirical studies that specify the mechanics of in-game purchases are necessary.

Social Features of Games

This study also focused on social features of games. In social games, players have easy access to other players through SNSs or social apps. In some game apps it is often recommended that players connect to social apps such as Twitter and LINE. Players can also become members of groups, such as guilds, and can act as helpers to other players.

The presence of social interactions with real or online friends can lead to positive as well as negative consequences (e.g., increase in social skills, decrease in loneliness, game addiction). For example, players can receive points as a reward when they send greetings, post text messages, and invite friends to play games. The reward system may motivate players to become more sociable. In social games, gratitude from other players can also work as a reward. On the other hand, the same social relationships might motivate players to access the games more frequently and may lead some individuals to gaming addiction or spending large amounts of money on these games.

In mobile social games, players are not only competing but also cooperating with their friends or online players via SNSs, or social apps. Players also share information and game screens. Additionally, the mechanics that promote social interactions are built into the apps, and these social features may attract new game players (*hook*), entice players to continue play (*retention*), and motivate players to spend more money (*monetization*), as Nojima (2011) suggested. However, only a limited number of empirical studies have analyzed the social context of these mobile games.

In order to fulfill the need for empirical findings regarding games, we developed three major research questions based on the social background of mobile social games played in Japan.

RQ1: What kinds of in-game purchase categories are made most frequently in mobile social games played in Japan?

RQ2 (1): What kinds of limited-time events are most frequent in mobile social games played in Japan?

RQ2 (2) Are there any differences between limited-time only *gacha* and normal *gacha* in terms of availability, probability of obtaining the rarest items, and the highest costs?

RQ3 (1): What kinds of social features -- cooperation, competition, or connections to SNSs -- are most frequent in mobile social games played in Japan?

RQ3 (2): Is the ratio of accompanying rewards different for different categories of cooperation?

METHOD

Survey for Sampling Games

Participants as Game Informants

Teenagers ($n = 950$, 475 men and 475 women) and young adults ($n = 1,710$, 508 men and 1202 women) participated in the study as informants about games. They were voluntary monitors, registered with a mobile online research company, who had agreed to participate in studies such as the current study.

Survey Procedure

In order to select popular social games played by young people, we conducted a survey in November 2013, with game informants described above. They were asked whether they played social games, including game apps such as "*Puzzle and Dragons* (Gunho Online Entertainment, 2012)," or "*LINE POP* (LINE, 2012)," in which players are able to cooperate or compete with other players by using mobile devices, such as cell phones, smartphones, or mobile terminals (excluding game consoles) within the last month. Participants who responded "yes" to the above question, and who were between 15 and 29 years old, were requested to continue to respond to the subsequent questionnaires.

One of the final purposes of this study was to investigate the effects of monetary features of games on the psychological characteristics of users. Therefore, we used a quota system, and assigned a greater number of players that paid additional money during social games to participate in the survey. As shown in Table 1, there were 570 non-paying (NPPs) and 380 paying teenage players (PPs). In the young adult group, there were 1,140 PPs, which was double the number of NPPs.

Table 1: Survey participants, who selected mobile social games

	Non-paying players (NPPs)	**Paying players (PPs)**	**Total**
Teenagers (age 15-19)	570	380 [a]	950
Young adults (age 20-29)	570	1,140	1,710
Total	1,140	1,520	2,660

Note : [a] The ideal number of this cell was 1,140, but the number of game players that made in-game purchases was limited to those under 20 years of age.

The ethical committee of the first author's university approved this survey. The informed consent of participants was considered unnecessary, as they had volunteered to participate in such studies. They were free to withdraw from the study at any time. The anonymity of all participants was assured in this study.

Sampling Popular Games.

All game informants were asked to list up to three games that they had played most frequently within the last month. Table 2 lists the 30 most popular social games played by young people. Two games tied as the 30th most popular game, and therefore, a total of 31 games representing (at the time of the study) the most popular social games in Japan were analyzed.

Coding Procedure of Game Analysis

Participants as Game Coders.

Coders ($N = 11$) with experience in playing social games (8 male university students and 3 male graduate students) were recruited for this study in February and March 2014.

Coding process.

First, we held training sessions for all coders and explained the game coding procedures, operational definitions, and coding categories. Then, we asked coders to analyze one game after watching the play screen and made sure that they understood the coding categories accurately. After the training sessions, we randomly assigned three coders to each of the 31 games (mean number of games analyzed by each coder was 2.81 games). Since the coders needed to understand the game mechanism (Schmierbah, 2009), the coders played the social games while recording the play screens for 30 minutes per day over three days. Each coder was asked to fill out a coding sheet after playing each game. All game play and analyses were conducted in the first author's laboratory.

The 31 games included apps obtained from Google Play and App Store. We used two Android OS terminals and two iPhone terminals, a total of four smartphones, and we signed service contracts for these four phones with a mobile phone service provider. In order to keep the social features active among the coders, four new accounts (e.g., GREE, Mobage, LINE, Twitter, and Google+) were created for each terminal.[3] All four accounts were registered as friends or followers. Coders were asked to write comments, or "tweet," when these actions were requested by an app. While playing, coders were asked to make in-game purchases for up to 1,000 yen when it was required for accurate coding. Prepaid cards funded by this research project were used to pay for the in-game purchases.

Four digital video camera recorders mounted on four tripods recorded the play screens. Each coder checked his play screen while they filled out the coding sheets. The coders completed a total of two sets of coding sheets, one for the first day and the other for the second and third days, based on the operational definitions and coding categories of the study. The unit of analyses was each social game.

Operational Definitions and Coding Categories

In-game purchases.

In order to answer RQ1, in-game purchases were operationally defined as "Purchasing costumes, weapons, items for restoring-stamina, and for proceeding with the story, and.

Table 2: Samples of Social Games Analyzed

Rank	Game Title	Frequency	Platform[a]	Publisher/Developer
1	Puzzle and dragons	910	Google[b]	Gunho[c]
2	LINE pop	325	LINE	LINE
3	LINE pokopan	313	LINE	LINE
4	LINE bubble	202	LINE	LINE
5	Quiz RPG: the world of mystic Wiz	128	Google	COLOPL/Kuma the Bear
6	LINE windrunner	124	LINE	LINE
7	Puyopuyo! quest	73	App Store	SEGA
8	Idol m@ster Cinderella girls	60	Mobage	DeNA
9	Love live! school idol festival	59	App Store	Bushiroad/Klab
10	Princess punt sweets	54	Google	Gunho
11	Rage of Bahamut	50	Mobage	Cygames
12	Girl friend (beta)	48	Ameba	Cyber Agent
12	Dragon collection	48	GREE	Konami[d]
14	Clash of clans	40	App Store	Supercell
15	Chain chronicle	38	Google	SEGA
16	Hay day	37	App Store	Supercell
16	Battle cats	37	App Store	PONOS
18	Sengoku collection	36	Mobage	Konami
19	AKB stage fighter	35	GREE	Ateam
20	Hakoniwa [miniature garden][e]	31	GREE	GREE
22	Candy crush Saga	30	Google	King[f]
22	Gundam card collection	30	Mobage	Bandai Namco[g]
23	Nouen hokkorina [cozy farm] [e]	29	Mobage	DeNA
24	Divine gate	27	Google	Gunho/Acquire
24	Tanken [adventure] [e] driland	27	GREE	GREE
26	Moba pro [mobile online pro baseball game] [e]	27	Mobcast	Mobcast
26	Animal boyfriend	27	GREE	Ambition
28	Fairy doll	24	GREE	Ambition
29	Solitaire	23	Google	Mobility Ware
30	One Piece grand collection	21	Mobage	Bandai Namco
30	My forged wedding	21	GREE	Voltage

Note. [a]Platform: Most frequently cited platform in the survey. Certain games can be obtained in multiple platforms. [b]Google: Google Play. [c]Gunho: Gunho Online Entertainment. [d]Konami: Konami Digital Entertainment. [e]English translation or explanation was added by the first author in [   ]. [f]King: King Digital Entertainment. [g]Bandai Namco: Bandai Namco Entertainment.

further battle time1. Purchases also include multi-purpose items within games and apps paid for with game coins or gold, which are obtained through actual monetary payments. Additionally, in-game purchases included obtaining paid *gacha*, which could involve playing roulette or a lottery or using game coins or gold obtained through monetary payment." The presence or absence of nine categories among the in-game purchase features was coded according to the following factors: (1) Restoring stamina or health, and proceeding with the story, or a adventure[4]; (2) Continuing battles with other players; (3) Re-continuing with the game by starting the game again at the final status after game was over (e.g., continue?); (4) Increasing the number of items that players owned; (5) Increasing the number of friends; (6) Purchasing other items, such as weapons, costumes, and tools; (7) Watching a special story; (8) Obtaining rare cards or other items through *gacha*, roulette, or a lottery; and (9) Purchasing multi-purpose items that could be used for more than three among the purposes (1)-(8) above.

In addition, when in-game purchases were possible, a questionnaire was used to inquire (a) whether players were asked to report their ages when paying money, and (b) whether players were asked to obtain permission from their parents or guardians when paying money. Moreover, when *gacha* was present, coders were requested to provide information about (c) the availability of information about probability of obtaining the rarest items, (d) the probability that players could obtain the rarest items, and (e) the highest cost for playing *gacha*.

Limited-time Events
To answer RQ 2, we requested the following information about limited-time events. (1) The availability of limited-time events in general (e.g., one-hour open adventures, limited-time *gacha*, battles, rankings and discounts); (2) The availability of limited-time only *gacha*; Any additional information for available limited-time *gacha* about (a) the availability of information about its probability, (b) the probability that players could obtain the rarest items, (c) the highest prices for using *gacha*, and (d) the presence of step-up *gacha*, in which players are able to increase the probability of obtaining rare items by paying more (e.g., when the number of items to draw is limited, or when all players can obtain specific rare items or cards by playing paid *gacha* continuously for 10 times); (3) The availability of limited-time only rankings in which top-ranking players are able to obtain rare items; And finally (4) availability to purchase limited-time only discounts.

Social features
For RQ3, social features were operationally defined as "Cooperating, or competing with other players and connecting or introducing other players through SNSs or social apps." The degree of cooperation was assessed by the presence, or absence of the following eight categories: (1) Going on an adventure or fighting with a strong enemy (e.g., a boss battle) cooperatively with other players (e.g., usually with an individual friend), (2) Cooperating with another player (e.g., usually with an individual friend) to engage in battles with other players, (3) Sending greetings, or messages, including simple fixed messages to other players, (4) Writing text messages to other players, (5) Sending requests to other players to become "friends," (6) Sending gifts to other players, (7) Exchanging items, and buying and selling items, and (8) Engaging in battles with a strong enemy (e.g., a boss) as a group or team, or competing with other groups or teams for

Figure 1: Frequencies of in-game purchases

points. In addition, we also assessed the presence or absence of rewards for each category of cooperation.

Competition was assessed by the presence or absence of the following five categories: (1) battles with other players, (2) battles with other groups (e.g., guilds), (3) competition with other players for scores, (4) competition with other groups for points, and (5) competition with real friends for scores (e.g., LINE or Facebook). For (1)-(2), (a) gain or loss of items as results of battles and (b) the presence of point ranking were also assessed.

Connections to SNSs were assessed by requests for connections or comments made on SNSs and/or social apps. Moreover, the names of SNSs were categorized. In the SNS, the presence of recommendations for the following three categories was also assessed: (1) introducing friends to the game, (2) commenting about the game, including reviews in Google +, "Likes" on Facebook, and comments in LINE timelines, and (3) Sending gifts related to the games.

Reliability

For all 31 games, reliability coefficients of six results (two coding sheets x three coders) were calculated by using the multiple coder version of Scot's pi (Scott, 1955; Wilson et al., 1997) for 47 categories. Nearly all the median reliability coefficients were above .86. For two variables, the median coefficients were less than .80. These were "limited-time only discounts (.56)," and "competition with other players for points (.56)." Since these features are often found as limited-time events and were only available for certain players, all categories were considered to have acceptable validity for conducting a systematic analysis of online services and interactive media.[5]

RESULTS

In-game purchases

In-game purchases were possible in 30 (97%) of the 31 games. Two types of payment were shown to be most frequent: one was for *gacha*, including payments for playing roulette or lotteries, which were found in 27 games (87%), and the other was "payments for restoring stamina or health, or for proceeding with the story," which were found in 27 games (87%). As shown in Figure 1, "purchasing other items", and "purchasing multi-purpose items" were also frequent.

The average cost of the most expensive *gacha* was 430 yen (approximately 4 USD), ranging in price between 40 yen and 1,200 yen. Among the 30 games facilitating in-game purchases, five games featured inquires as to the age of players. In four of these five games, minors were requested to obtain the permission of parents or guardians before making purchases. In only one game, children under 13 years were not permitted to make in-game purchases.[6] For normal *gacha*, information on the probability of obtaining rare items was observed in 14 games; the mean probability was 2.85% (SD=3.07%), and this probability ranged between 0.05 % and 8.33%, depending on the game.

Limited-time Events

Limited-time events were found in 28 games (90%) and limited-time *gacha* was the most common in this category, found in 26 games (84%). "Limited-time only discounts" were the second (65%, 20 games), whereas "limited-time ranking" was found in less than half of the games, 48% (15 games). Among games featuring "limited-time only *gacha*," the most expensive *gacha* (M=911, SD=1,096) cost significantly more than normal *gacha*, $t(24)=2.15$, $p=.042$. The mean cost of limited time only *gacha* in each game ranged from 40 to 4,883 yen. Information on the probability of obtaining the rarest items in limited-time only *gacha* was given in 17 games. Although the probability of obtaining the rarest items (M=5.15%, SD=8.88%) was higher than it was in normal *gacha*, this number was not statistically significant $t(13)=1.05$, $p=.315$. The average probability of gaining items from limited time only *gacha* in each game ranged from .05 to 36.67%. Finally, step-up *gacha*, in which the probability of obtaining rare items increases through higher payments, was found in 17 games.

Social features

Social features were found in all 31 games. Cooperation was a feature of 29 games (94%). As shown in Figure 2, the most frequent categories of social features were "sending greetings or messages" (24 games), "friend request" (23 games), and "writing text messages" (21 games). The reward ratio was highest in teamplay (89%, eight of nine games), and other common categories were "cooperating in adventures" (62%, eight of 13 games), and "sending greetings or messages (58%, 14 of 24 games)."

Competition was possible in 27 games (87%) and as shown in Figure 3, the most frequent categories of competition were "competition with other players for high scores" (20 games) and "battles with other players" (14 games). Among the 14 games in which players battled with others, the players were able to gain or lose items after battle results in seven games (50%,), rankings were shown in six games (43%), both items and ranking were shown in two games (14%), and either items or ranking was found in 11 games (79%). Similarly, among the four games featuring "battle with other groups," players were able to gain or lose items after the battles in two games (50%) and rankings were shown in three games (75%).

Connecting to a SNS was recommended in 26 games (84%) and as shown in Figure 4, the most frequently recommended SNSs were LINE (17 games), facebook (15 games), and Twitter (12 games). Among these 26 games, players were recommended to "invite SNS friends to the games" in 23 games (88%), "comment about the games" in 13 games (50%), and "send gifts to SNS friends" in only six games (23%).
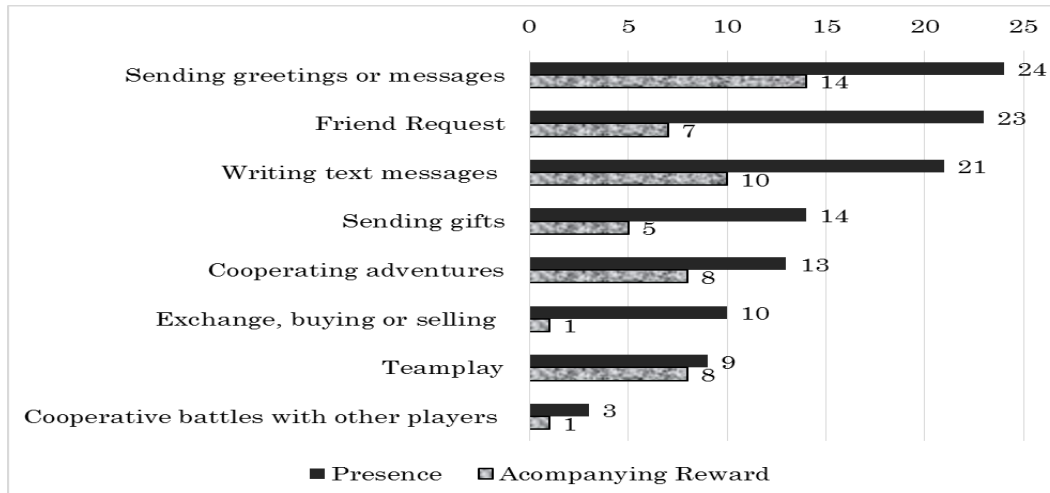
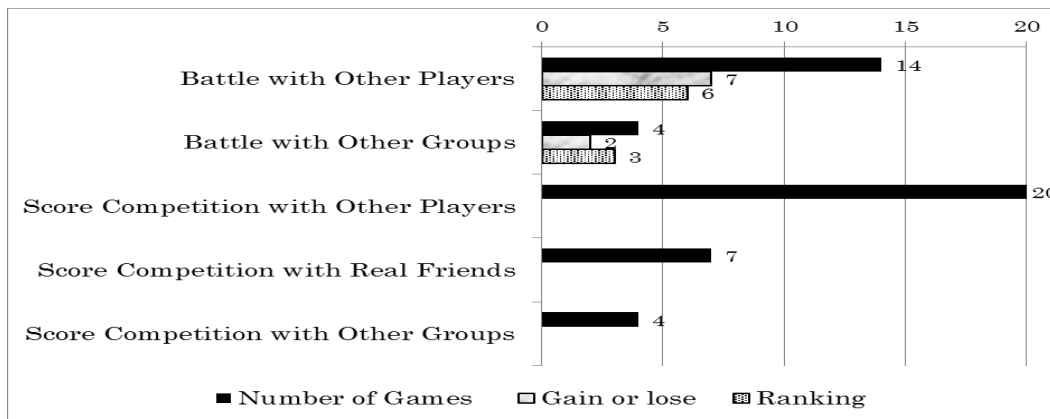**Figure 2**: Frequencies of cooperation

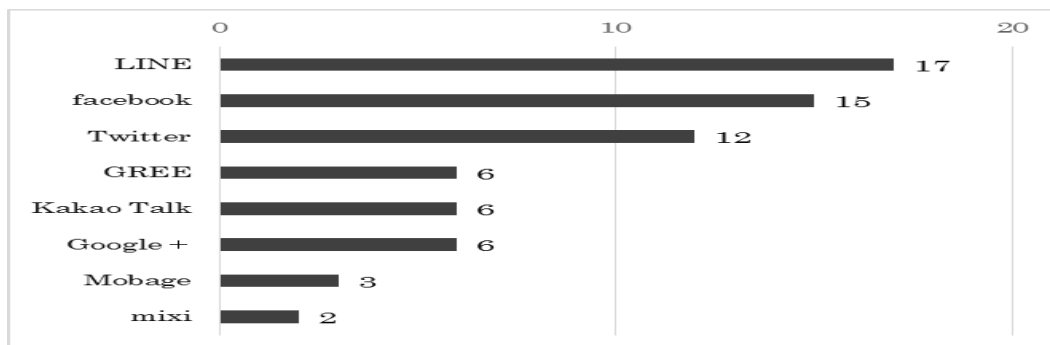
Figure 3: Frequencies of competition

Figure 4: Frequencies of connections to SNS or social apps

DISCUSSION

This study systematically analyzed the contexts of in-game purchases and social features in mobile social games. The study found that *gacha*, and "stamina-restoring or proceeding with the story" were the most frequently found categories that required in-game purchases. Teramoto et al. (2014) found that players who use *gacha* spent more money on mobile social games. Therefore, the results of the current study suggested that

the presence of *gacha* helps to monetize these games, and that heavy use of *gacha* could lead to players spending greater amounts of money.

"Stamina-restoring and proceeding with the story" was found as often as *gacha*.. By continuing to buy and use items, players can continue playing the game for longer times. Therefore, exposure to this feature should be focused on when analyzing the time and money spent on game play. However, Teramoto et al. (2014) found weaker positive correlations between the "stamina-restoring and proceeding with the story" feature and the amount of money that players spent monthly on games. This type of feature itself may not lead to increased monetary purchases. That is, there are other motivations or contexts (e.g., obtaining extremely rare items in limited-time events, being motivated to advance in a story quickly in limited-time events) that may lead players to buy items to restore stamina and/or proceed with a story.

During limited-time events, limited-time *gacha* was offered in a number of games and the average probability of obtaining the rarest items was somewhat higher than that for normal *gacha*, although the maximum cost of this type of *gacha* was higher than for normal *gacha*. Teramoto et al. (2014) also found that players who frequently use this limited-time *gacha* spent more money on mobile social games. Therefore these types of limited-time events may motive some players to use *gacha* more frequently than usual because players might assume that "it is an ideal time to make in-game purchases!"

More interestingly, this study also found that the limited-time events were *not* limited to a certain time period in a literal sense because the reliability of event-related categories, except for limited-time discounts, was consistent among coders. If the limited-time events were rare, and truly available only for a limited time, their reliability would be low. Although coders found different events at a different time, the results of this study indicated that game publishers created events on a near constant basis in order to keep players active (Mitsubishi Research Institute, 2013).

In a majority of games, there were competitive, as well as cooperative social features, such as exchanging greetings and messages and sending friend requests. Previous content analyses of video games have suggested that competition was more frequent than cooperation (Shibuya and Sakamoto, 2005), but the results of this study suggested that these trends have changed. In addition, this study also found that ratios of reward were likely to be higher in both cooperative "teamplay" and group competition (Figures 2 and 3). Currently, players are more likely to play social games at their own pace and when they have free time; they are not obligated to play together at the same time. In other words, individualistic play style and individualistic cooperation is possible in mobile social games. Therefore, "teamplay" may require greater patience yet have more rewards than individualistic cooperation and competition. It is possible that further investigations could reveal positive effects of certain cooperative features in relation to the presence or absence of rewards or consequences.

There are several limitations to this study. First, the results of this study were based on a playing period of only three days on a social game for each coder. Some games require several weeks of play before a player can gain friends and reach competitive ranking. This is also true for conducting team play in which players continue to play and reach certain levels. The study did not reflect information on rewards of such social features, unless this information had been provided in advance. Second, although this study found many games included *gacha*, step-up *gacha*, and limited-time only *gacha*, these features

did not always lead players to spend additional money. It is suggested that further empirical studies should be conducted about the interactions between game mechanics and the personalities, motivations, and psychological characteristics of players.

In spite of these limitations, this study highlighted the context of in-game purchases and social features of mobile social games in Japan. Results showed that the contexts of these purchases and features vary among games. This research should help build mobile game literacy for children and adolescents that in turn can provide socially acceptable gaming experiences in mobile social games.

Endnotes

1 A major part of this study was first presented in Japanese at the Summer Research Conference of Digital Games Research Association Japan (DiGRA JAPAN) at the Tokyo University of Technology on 24th August, 2014.

2 The average exchange rate of 1 US dollar (USD) was taken as 98.65 Japanese yen (JYN: Mitsubishi UFJ research and consulting, 2014).

3 We ensured that creating multiple accounts for this study did not cause problems or violate the rules and guidelines of SNS, and social apps, and we obtained oral or written permissions from certain SNS when it was considered necessary.

4 Originally, "restoring stamina or health" and "proceeding with the story" were coded separately. They were combined later because players could restore stamina and health when proceeding with the story or in adventure modes of some social games.

5 The reliability of "limited-time only discount sale" and "score competition with other players" was .56. The former was available only for one day for certain players, and the latter was available for only a limited-time event, or appeared only when another friend played the game within the week.

6 For game apps obtained through Google Play and App Store, players or their parents, or guardians, could set passwords for making additional payments. In other browser games in certain SNSs, such as GREE and Mobage, the social game industry set the maximum amount of payments that could be made by minors (e.g., 5,000 yen or less for a month for those under 16 years of age).

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