Relationship between Motives for Gaming and Playing Gacha among University Students

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ABSTRACT
This study aimed to investigate the relationship between college students' motives for using games in their daily lives and playing gachas, and to obtain basic knowledge for understanding their motives for playing gachas and essential knowledge for developing games involving gachas. We surveyed 264 university students enrolled in information-related faculties on the "game uses and gratifications" and "motives for doing gacha" items and examined the relationship between the two using correlation and canonical correlation analysis. The results revealed a tendency for users to have strong motives for messing around.

Keywords
gacha, motives for doing gacha, loot box, motives for using games, gambling.

INTRODUCTION

Research Backgrounds
With the extensive expansion of smartphones in recent years, the game market has undergone a fundamental transformation. In the past, the mainstream of games was to purchase and play game software; however, nowadays, many smartphone games can be played without buying the game, and items can be purchased in the game as needed.

Purchasing items as needed is one of the game billing methods, called item billing. There are five types of game billing methods: "package sales," "download sales," "time-based billing," "item-based billing," and "a combination of these billing methods" (Japan Online Game Association n.d.). Obtaining items by charging in-game is generally called "gacha." Gacha is a "random item provision method: a method in which characters, items, etc. (hereafter, items, etc.) that can be used in an online game with characters, pictures, signs, etc. displayed electromagnetically are provided by a

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method in which the type of items, etc. is determined by using chance" (Computer Entertainment Supplier's Association 2016).

According to Koeder et al. (2017), gacha derives from a real, small capsule-shaped toy lottery machine, the "Gacha Gacha" or gachapon. The sound of turning the lever is like "Gacha Gatha," whereas the sound of opening a capsule is similar to "Pon." Generally, the "Gacha Gatha" toy is not sold in a store with a price tag. Therefore, people who want a "Gacha Gatha" toy should try their luck by turning the "Gacha Gacha" machine lever to pay real money. In particular, charging to play gacha is known as "pay-to-play gacha." Gacha has been adopted as a game system in mobile and social games and is one game design that generates enormous profits in the game market.

The closest equivalent to a gacha is a loot box, in which players receive a random chance to receive an item they can use in some way. According to Bhandari (n.d.), there is a difference between loot boxes and gacha, as gacha games represent a collection of cards, toys, and characters used to earn points. Loot box is a game in which certain items with surprise elements can be obtained upon reaching a certain level in the game. Telfers (2017) states that gacha can be regarded as a spectrum, whereas the loot box can be defined as a weak and robust gacha. In this study, to focus mainly on gacha charges found in smartphone applications, we defined gacha charges as the behavior of charging in smartphone games and did not delve deeply into the differences between gacha charges and loot boxes.

Gacha is a system in which items are purchased by lottery. Although it offers a particular way to enjoy games, it has been pointed out that it is addictive, as evidenced by the "heavy charges" and "wasteful charges" that result in enormous amounts of money being charged, and the "kompu gacha" service that has been called into question (Consumer Affairs Agency 2016). There are also countries where loot boxes are illegal (Gartenberg 2018), and excessive charges, gachas, and loot boxes with no explicit probabilities are considered problematic.

Arai (2013) states that playing games on the Internet is often perceived negatively. However, while negative aspects of playing games are often discussed, including charging money, it is not the charging money to play games that is a problem in itself, but, rather excessive and uncontrollable charging. Yamaguchi (2013), for example, argues that the problem is not that people play games by paying too much, but instead that they spend too much or cannot control themselves. Yamaguchi (2013) claims that smartphone games, including gacha, fuel the gambling spirit and users who prefer risk tend to increase their monthly billing. Specifically, excessive gambling is a problem, but not a critical problem, when it is within an appropriate range and under one's control. Excessive investment in any hobby can be a problem, which is not limited to gambling. This is not a problem for gambling in particular, but is related to the problematic behavior observed in other addictions. Knowing how to interact with games appropriately and one's attitude toward gacha is expected to prevent dependence on gacha and help people enjoy playing games and enrich their lives.

As described above, it is essential to conduct research to promote the appropriate use of gacha charges in the future. Accordingly, it would be helpful to examine the construction of attitudes toward gacha and proper distance from gacha and the relationship with the game usage motive and psychological factors of users who pay for gacha. In terms of reasons for using games, it is assumed that some students pay because they want items that will help them clear the game, but also those who pay because they want their favorite characters or to change the appearance of game characters, and users whose motives are intertwined with other reasons. Thus, it is

expected that there is a relationship between the motive for using games and the motive for playing gacha.

Several studies on gacha charges have been carried out so far. For example, Li et al. (2019) examined the relationship between the actual status of being charged for gacha in the past year and the items of Internet gaming disorder listed in DSM-5, Problem Gambling Severity Index (PGSI), and BSI-18 (Brief Symptom Inventory 18, a questionnaire asking symptoms of somatization, depression, and anxiety). The results showed that gamers who were charged for gambling had significantly lower results in problematic video game behavior, problem gambling severity, and BSI-18 than gamers who were not charged for gambling. Moreover, the authors found direct effects on problematic video game behavior and problem gambling severity and indirect impact on the BSI-18. Zendle et al. (2019) surveyed gamers who usually play games and are charged for gacha and examined the problem of gambling severity. The results revealed that charged gamers had higher gambling severity problems than uncharged gamers. Hiramatsu (2019) also investigated users' attitudes toward paying for gacha and found that users' motivations for both playing games and pulling gacha were divided into two types: those who focused on the comparison with other players, which is a characteristic of social games, and those who concentrated on collecting characters, with the character-oriented type being more common. The results also showed that paying and non-paying users' attitudes differed considerably. Thus, while several other studies on each-charging can be found (e.g., Brooks and Clark 2019), most studies have examined the relationship between each-charging and dependence. The position of gacha in game design has also been studied (e.g., Koeder et al., 2018), and gacha charges are of interest to game developers as well.

In the current situation, it is essential to identify the kind of users that are playing gachas to develop games that include gachas. It is also necessary to understand the tendency of users who play gachas in education. The aforementioned studies focus on identifying the kind of users that play gachas. However, focusing on psychological factors, such as how users play games, is also necessary. Focusing on psychological factors, such as how users play games, is necessary from this perspective. One such psychological factor in how users play games is their motive for using games. By understanding the relationship between users' motives for using games and playing gachas, we can obtain a clearer picture of their propensity to play gachas; however, no such study exists to our knowledge.

Therefore, this study aimed to obtain detailed information on users' propensity for doing gacha, and provide suggestions for developing games that include gachas, as well as knowledge for the appropriate use of games that have gachas.

METHODOLOGY

Survey Targets and Procedures

An online survey was conducted in December 2022. The subjects were 27 first-year students, 213 second-year students, 21 third-year students, and 3 fourth-year students at a private university in a department of game development, with a mean age of 19.68 years (SD 0.85). In total, 168 (66.67%) of the 264 students had ever paid for gacha (27 first-year students, 132 second-year students, 16 third-year students, and 1 fourth-year student). The user base for playing Gacha is diverse, but in this study, we conducted a survey of college students, who are more likely to be game users than the general public and who may be involved in game development in the future. The survey took approximately 10 minutes to complete, and no questions were asked regarding names, e-mail addresses, student ID numbers, gender, or other personally identifiable information. Before administering the survey, we presented a request form with an

outline of the survey and explained that the survey would be administered only if the respondents agreed with the content of the form, and that their agreement would be deemed as consent upon response.

Survey Items

First, we asked questions about whether the user had ever actually paid for gacha and excluded users who had not played any gacha smartphone games. Next, 27 items from the "game uses and gratifications" scale (Iguchi 2013, Table 1) and items related to the "motives for doing gacha" (Hiramatsu 2017, Table 2) were prepared to determine the motive for doing gacha and the motive for using the digital games. All items were answered on a five-point Likert scale ranging from "5: Very much applies" to "1: Doesn't apply at all."

Although, depending on the game, only some of Hiramatsu's (2017) items were included—for example, "I want to clear dungeons"—it is difficult to say that they comprehensively assess all motives for doing gacha. Nonetheless, they are sufficient as the present study was designed to obtain basic information using Hiramatsu's items.

	Items
F1: Fantasy	
1	Because games allow you to have fun in a world that is different from reality
2	Because I can do things that I can't do in real life
3	Because it is fun to play as a game character
4	Because I am interested in the world where the game takes place
5	Because the story is interesting
F2: Recognition	
6	Because I like to feel respected by others when I do well in the game
7	Because I want to show off by winning the game faster than others
8	Because I want to be the best player among my friends
9	I don't want to be beaten in a competitive game
10	Because I enjoy beating my opponents in competitive games
11	Because the game is popular
F3: Preference	
12	Because my favorite illustrator draws the game
13	Because my favorite voice actor appears in the game
14	Because my favorite characters appear in the game
15	Because the pictures and images are beautiful
16	Because I like the sound and music
F4: Achievement	
17	Because I enjoy completing the tasks in the game
18	Because I enjoy overcoming difficult situations
19	Because it's fun to improve as you play
F5: Friendship	
20	I enjoy playing games with my friends
21	Because I sometimes invite or am invited to play games with my friends
22	Because I sometimes talk about games with my friends
F6: Study	
23	Because I can understand difficult things through games
24	Because it helps me learn
25	Because I can gain knowledge from playing games
F7: Diversion	

26	Because it helps me pass the time
27	Because there is nothing else to do

Table 1: Game Uses and Gratifications Scale (Iguchi 2013)

	Item
1	I want a new character
2	I want strong characters
3	I like the design of the character
4	I like the voice actor of the character
5	I want to clear events
6	I want to clear dungeons
7	I want to be superior in the game
8	I want to get a high rank in the game
9	I want to be high in the ranking
10	I want to beat others
11	I want to be stronger than others
12	I want to show off my skills to others
13	Gacha chance UP event
14	New gacha and packages

Table 2: Motives for Doing Gacha (Hiramatsu 2017)

Analysis Procedure

First, descriptive statistics were obtained for each item, and correlation analyses were conducted between each factor of game uses and gratifications, and each item of motive for turning in the gacha. In addition, a canonical correlation analysis was conducted to comprehensively examine the relationship between the game uses and gratifications scales and the motive for doing gacha. IBM SPSS Statistics 28 was used for the analysis.

Canonical correlation analysis is based on correlation analysis and can evaluate significance. Cluster analysis can calculate numerical values, such as the mean of each cluster, but is more complex than canonical correlation analysis to observe overall trends and examine significance. Covariance structure analysis involves formulating a model based on a hypothesis of association and questioning the model's validity. However, as this study aimed to understand the overall trend, canonical correlation analysis was used.

RESULTS

Descriptive Statistics

Tables 3 and 4 show the descriptive statistics for game uses and gratifications, and the motive to play gacha, respectively. Ceiling effects were observed for "fantasy," "achievement," "friendship," "I want a new character," "I want strong characters," and "I like the design of the character." In this study, the subjects were students at the department of game development, and their approach to games was assumed to be higher than that of general students; thus, a ceiling effect was observed. Therefore, because the purpose of this study was to conduct a survey using the items of the previous studies and determine the actual status of the students, the factors and items in which a ceiling effect was observed were made the object of analysis. Besides, Cronbach's alpha coefficients for each factor of game uses and gratifications ranged from 0.66 to 0.84, indicating that there were no problems with game use.

Factor	Mean	SD	α

Fantasy	4.38	0.64	0.77
Recognition	3.31	0.99	0.83
Preference	3.85	0.78	0.73
Achievement	4.21	0.80	0.82
Friendship	4.36	0.87	0.82
Study	3.77	1.02	0.84
Diversion	3.35	1.09	0.66

(n = 168)

Table 3: Descriptive Statistics of Game Uses and Gratifications

Item	Mean	SD
I want a new character	4.08	1.28
I want strong characters	4.05	1.21
I like the design of the character	4.34	1.07
I like the voice actor of the character	3.49	1.45
I want to clear events	3.26	1.44
I want to clear dungeons	3.20	1.39
I want to be superior in the game	3.24	1.45
I want to get a high rank in the game	3.05	1.49
I want to be high in the ranking	2.71	1.51
I want to beat others	2.89	1.45
I want to be stronger than others	2.95	1.46
I want to show off my skills to others	2.97	1.43
Gacha chance UP event	3.60	1.37
New gacha and packages	3.27	1.46

(n = 168)

Table 4: Descriptive Statistics of Motivations for Doing Gacha

Result of Correlation Analysis of all Factors and Items

Pearson's product-rate correlation coefficients were obtained to understand the relationship between each item of the motive to play the gacha and each factor of the game uses and gratifications scale. The results are shown in Table 5, Appendix. In Table 5, the motivation items for doing gacha are set as GM1, ..., GM14.

The factors of the game uses and gratifications scale that had some positive correlations with the motive for doing gacha were fantasy, recognition, preference, achievement, and friendship. In contrast, study and diversion showed little relationship with the motive for doing gacha.

Result of Canonical Correlation Analysis

In the former section, we used correlation analysis to examine the relationship between game uses and gratifications measures and the motive for turning in the gacha. However, possibly, the motives for game use are composite. For example, people want to win because they want to be recognized by others (recognition and achievement positively influence the motive to play gacha), and people want to collect items for their own satisfaction even if they are not recognized by others (preferences positively influence the motive to play gacha, whereas recognition negatively influences the motive to play gacha). To comprehensively examine the relationship between the motive to play gacha and the motive to use games, we conducted a canonical correlation analysis using five variables (fantasy, recognition, preference, achievement, and friendship) as the first group and 14 variables of motive to play gacha as the second group, which were found to be related to several items of the motive to play gacha.

The results of the canonical correlation coefficients are shown in Table 6 and those of the canonical loadings in Table 7. Of the five canonical correlation coefficients calculated, λ_1, λ_2, and λ_3 were significant at 5 percent level. Besides, λ_4 was $p < .10$, indicating a significant trend at 10 percent level. The graphs also show the canonical loadings for each of the canonical variables from Figure 1 to Figure 4, Appendix.

For the first canonical variable, in the first group, the coefficients were larger in the order of preference and achievement, with positive values for achievement and negative values for preference. In the second group, the coefficients were larger in the order of "I like the voice actor of the character," "I like the design of the character," "I want to show off my skills to others," "I want to be high in the ranking," and "I want a new character," with positive values for "I want to show off my skills to others" and "I want to be high in the ranking," and negative values for "I like the voice actor of the character," "I like the design of the character," and "I want a new character."

For the second canonical variable, in the first group, the coefficients were larger in the order of achievement and preference, with negative values for each factor. In the second group, the coefficients were larger in the order of "I want to show off my skills to others," "I want to beat others," "I want to get a high rank in the game," "I want to be high in the ranking," "I want to be superior in the game," "I want to be stronger than others," "I like the voice actor of the character," "I want strong characters," "I want a new character", "I want to clear dungeons," "New gacha and packages," "I want to clear events," and "Gacha chance UP event," with negative values for all factors.

For the third canonical variable, in the first group, the coefficients were larger in the order of achievement and recognition with negative values for each factor. In the second group, the coefficients were larger in the order of "I want to be stronger than others," "I want to beat others," "I want to get a high rank in the game," "I want to clear dungeons," and "New gacha and packages," with negative values for all factors.

For the fourth canonical variable, in the first group, the coefficients were larger in the order of friendship and achievement, with positive values for achievement and negative values for preference. In the second group, the coefficients were larger in the order of "Gacha chance UP event," "I want a new character," and "I want to clear dungeons" with positive values for "I want a new character" and "I want to clear dungeons," and negative values for "Gacha chance UP event."

	λ	*df*	χ^2	*p*
λ_1	.665	70	211.833	.000
λ_2	.583	52	120.257	.000
λ_3	.377	36	55.109	.022
λ_4	.338	22	30.978	.097
λ_5	.270	10	11.878	.293

Table 6: Canonical Correlation Coefficients of Game Uses and Gratifications (Fantasy, Recognition, Preference, Achievement, Friendship) and Motivation for Doing Gacha

1st grp	λ_1	λ_2	λ_3	λ_4
Fantasy	-.029	-.397	.216	.206

Recognition	.431	-.803	-.399	.098
Preference	-.746	-.642	.007	-.175
Achievement	-.190	-.173	-.646	.662
Friendship	.078	-.443	.232	.831
2nd grp	λ_1	λ_2	λ_3	λ_4
I want a new character	-.326	-.414	-.188	.435
I want strong characters	-.138	-.513	-.092	.120
I like the design of the character	-.449	-.242	.071	-.201
I like the voice actor of the character	-.738	-.530	.032	-.211
I want to clear events	-.212	-.338	-.231	.269
I want to clear dungeons	.023	-.369	-.396	.370
I want to be superior in the game	.184	-.611	-.297	.086
I want to get a high rank in the game	.197	-.665	-.416	-.010
I want to be high in the ranking	.366	-.647	-.086	-.075
I want to beat others	.248	-.689	-.490	-.007
I want to be stronger than others	.273	-.590	-.523	-.041
I want to show off my skills to others	.389	-.713	.086	.175
Gacha chance UP event	-.009	-.304	-.211	-.496
New gacha and packages	-.019	-.358	-.364	-.218

Table 7: Canonical Loadings of Game Uses and Gratifications (Fantasy, Recognition, Preference, Achievement, Friendship) and Motivation for Doing Gacha

DISCUSSIONS

Based on the above results, the following discussion is provided.

Table 5 shows that the game uses and gratifications scale factors that had several positive correlations with the motives for turning the gacha were fantasy, recognition, preference, achievement, and friends. This indicates a particular relationship between the user's desire to play games to satisfy the user's desire to enjoy a different world from reality, to be recognized by others, to acquire visual and auditory information that matches the user's preference, to feel growth by completing tasks, and to play games with friends, and the motivation to turn to the gacha. In addition, gacha is generally used in games. In addition, because gacha is usually used to gain satisfaction from games, users who value fantasy, recognition, preference, achievement, and friends as motives in games may have higher motives to play gacha than those who value study and diversion.

One factor not found to be associated with the motive concerning the study factor may be that the motives for playing the game are different in the first place. As for the other factors, the motive for playing games is mainly entertainment. In other words, the evaluation of satisfaction obtained from games is done for entertainment. Meanwhile, the study factor on the satisfaction scale is based on the degree to which the study effect is realized when the game is used as a part of the study. Considering the difference between the study factor and the other factors, the gacha system is possibly not necessarily related to playing games for study. Hence, the gacha system may increase the satisfaction of playing games for entertainment, which may be highly associated with the motivation to play gacha.

Furthermore, the diversion factor may be related to a passive motive of playing games as neither entertainment nor study but rather to kill time. Users who play games as a diversion may have less of a sense of purpose such as entertainment and may not be

attracted to gacha as a system that enhances the entertainment appeal of games. Consequently, may have less of an association with the motive to play gacha. In general game design, gachas require users to pay the price in the form of fees and complete in-game missions, which users perceive as burdensome. Therefore, users who use gacha as a diversion may feel that the satisfaction they get from gacha is not worth the burden they have to pay for it.

Next, we examined the relationship between the user image of games mainly for entertainment purposes and the motive to play gachas, based on the results of a canonical correlation analysis of the factors of fantasy, recognition, preference, achievement, and friends, which were found to be potentially related to the motive to play gachas. The items with an absolute value of 0.3 or more in the canonical loadings are interpreted as having a certain degree of association.

First, looking at the first canonical variable, high recognition and low preference positively affect “I want to show off my skills to others” and “I want to be high in the ranking. “I like the voice actor of the character,” “I like the design of the character,” and “I want a new character” are negatively affected. More precisely, gamers who have a strong desire to be recognized by others and who are not interested in factors such as characters and music that are not directly related to competition with others (hereafter referred to as “competitor type”) may be motivated to play gacha for reasons such as beating their opponents, becoming more potent than their opponents, and becoming better than their opponents. This is assumed to be the reason for their desire to beat their opponents, become stronger than their opponents, and become better. Competitor-type users have a stronger desire to be recognized by others. They are assumed to play games and play gacha to be recognized by others based on their superiority or inferiority in various game indices. Specifically, competitive users are likely to prefer game designs in which the main objective is to determine worth or inferiority over others, such as versus, ranking, and leaderboards, and in which the elements obtained through gachas are advantageous in competition with others.

Furthermore, the first canonical variable indicates that low recognition and high preference are associated with “I like the voice actor of the character,” “I like the design of the character,” and “I want a new character,” and are negatively associated with “I want to show off my skills to others” and “I want to be high in the ranking.” Users who do not want to be recognized by others but are interested in the characters and music (hereafter referred to as “collector type”) are likely to be motivated to play the gacha not because of competition with other users, but because their favorite characters or voice actors are in the game. The game design preferred by the collector type is different from that of the competitor type in that the primary purpose is not to compete with others but to establish enhanced communication with characters acquired through gacha, such as simulated conversations, and to be able to freely look at the costumes of characters developed through gacha and items and ornaments that can be placed in the virtual space. The primary purpose of this type of game is not a competition with other players but rather to enhance communication, such as simulated conversations with characters acquired through gacha.

Next, the second canonical variable shows that higher levels of fantasy, recognition, preference, and friendship (especially recognition and preference) are associated with “I want to show off my skills to others,” “I want to beat others,” “I want to get a high rank in the game,” “I want to be high in the ranking,” “I want to be superior in the

game," "I want to be stronger than others," "I like the voice actor of the character, "I like the voice actor of the character," "I want strong characters," "I want a new character," "I want to clear dungeons," "New gacha and packages," "I want to clear events," and "Gacha chance UP event." In other words, users who play games from composite motives centering on the consciousness of wanting to be recognized by others and the motive that their favorite character or voice actor is in the game (hereinafter referred to as "composite type") are motivated to play gachas by obtaining various elements to enjoy the game comprehensively rather than by a specific desire. The game design preferred by composite-type users is centered on a hybrid motivation. Such game design includes elements that respond to various user desires, such as competition with others and a collection of characters and items. The gacha can have multiple features beneficial for competition with others and elements that can satisfy the desire for display. It can also have ingredients that combine both. The gacha may have multiple parts that are useful for competition with others and can satisfy the desire for collection, or it may have elements that can benefit both.

Looking at the third canonical variable, higher achievement and recognition indicate "I want to be stronger than others," "I want to get a high rank in the game," "I want to beat others," "I want to clear dungeons," "New gacha and packages," and "I want to be superior in the game." Thus, considering users with a strong desire to be recognized by others and gain a sense of accomplishment by completing tasks in the game (hereafter referred to as "challenger type"), the desire to beat their opponents, become more potent than their opponents, and clear the game are thought to motivate them to play the gacha. The game design preferred by the challenger-type users is centered on repeated challenges against the computer (PvE, Player versus Environment/Enemy) with a clear mission to accomplish. It includes some player versus player (PvP, Player versus Player) elements. As for the gacha, it is possible to acquire items that strengthen characters and assist in achieving goals (e.g., retry missions).

Looking at the fourth canonical variable, it can be interpreted that high friendship and achievement have a positive effect on "I want a new character" and "I want to clear dungeons" and a negative impact on "Gacha chance UP event." In other words, users who have a strong desire to connect with friends and others through games and gain a sense of accomplishment by completing tasks in games (cooperative users) are likely to be motivated by the desire to have new characters and finish games. While the results for the other user types showed that it was easy to find a direct relationship with the motivation to turn the gacha, it is assumed that for the cooperator type, stronger characters and items are needed to help others and cooperate with them to achieve their goals; thus, obtaining these items may be the indirect motivation for players to turn the gacha. The game design preferred by cooperator-type users is mainly PvE, as in the case of challenger-type games. Still, it is also possible to lend out the characters and items one has developed and acquired to others to face powerful boss characters with the cooperation of many users and engage in team battles in PvP. In PvP, users can fight against powerful boss characters by cooperating with many other users.

Based on the canonical correlation analysis results, we found five types of amusement game users, that is, competitor, collector, composite, challenger, and cooperator. Each type of user has a different motive for turning in gachas, as well as an additional motivation to play gachas. In recent years, many of the so-called gacha (pay-per-gacha) games have been designed so that all users can enjoy the game and want to play gacha. From the game developer's point of view, the most critical issue in developing games

with gacha-based pay-to-play models is how to obtain continuous payment from users. Based on the findings of this study, appropriate gacha elements can be estimated based on the user type ratio of users interested in the developed game.

Furthermore, from the user's point of view, knowing what type of user one is can make the person aware of the gacha elements likely to be absorbed into the game, thereby improving game literacy to prevent undesirable gacha-paying behavior (so-called "wasteful paying"). While gacha is often perceived as a negative issue from the perspective of users, for those involved in game development, its presence is increasing yearly as a fundamental business model with the expectation of continuous revenue. It would be beneficial for both users and game developers to clarify what elements of games lead to a sense of satisfaction and one aspect of the relationship between the game uses and gratifications factors and the motives of users who play gachas.

CONCLUSION

This study investigated the relationship between college students' motives for using games in their daily lives and playing gachas. It also sought basic knowledge for understanding their motives for playing gachas and essential knowledge for developing games involving gachas. As a result, we could understand the tendency of users with strong motives to play gachas.

The study results provide essential knowledge for developing games that include gacha and a detailed understanding of users that have gacha. It is necessary to continue research on gacha, analyze the trends of game users, including gacha, clarify the appropriate use of gacha-charged games, and accumulate knowledge to enhance education using games. These issues should be addressed in the future.

NOTE

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BIBLIOGRAPHY

Arai, N. 2013. "The Analysis of the Social Psychological Factors That Influence the Enthusiasm of Social Game." *Sophia Economic Review*, 58(1-2), 277–287. [in Japanese]

Bhandari, S. n.d. *Difference Between Gacha Game and Loot Box*. https://askanydifference.com/difference-between-gacha-game-and-loot-box/

Brooks, G. A. and Clark, L. 2019. "Associations between loot box use, problematic gaming and gambling, and gambling-related cognitions." *Addictive behaviors*, 96, 26–34.

Computer Entertainment Supplier's Association. 2016. *Guidelines for the Operation of Random Item Provision Methods in Network Games*. [in Japanese] https://www.cesa.or.jp/uploads/2016/release20160427.pdf.

Consumer Affairs Agency. 2016. *Online Game "Kompu-Gacha" and Premiums Regulations under the Law for Preventing Unjustifiable Premiums and Misleading Representations.* [in Japanese] https://www.caa.go.jp/policies/policy/representation/fair_labeling/guideline/pdf/120518premiums_1.pdf

Japan Online Game Association. n.d. *For Safe Enjoyment -Payment, Security and Crime Prevention-*. [in Japanese] https://japanonlinegame.org/campaign_onlinegameguide/safety.html

Fukui, M., Kunouchi, M., Ohdachi H. and Kuroda, M. 2021. "An exploratory study on the relationship between gacha-charging behavior of college students and their motives for using games." Research report of the 15th meeting of the "Games and Education" of the Game Amusement Society, 2021-GE-1:1–6. [in Japanese]

Hiramatsu, A. 2017. "A Survey of Social Game Users About Gacha Probability Display." *Transaction of IEEJ Electronics, Information and Systems*, (1-5・7-25), 41–44. [in Japanese]

Hiramatsu, A. 2019. "Change of User Behavior by Probability Notices on Random Type Item Providing Systems." *The 10th Conference of Transdisciplinary Federation of Science and Technology*, 10. [in Japanese] https://doi.org/10.11487/oukan.2019.0_D-3-2.

Iguchi, T. 2013. "Video Game Uses and Gratifications of University Students in Japan: Towards Establishing Game User Research." *Journal of Information and Communication Research*, 31(2), 67–76. [in Japanese] https://doi.org/10.11430/jsicr.31.2_67.

Koeder, M., Tanaka, E. and Sugai, P. 2017. "Mobile Game Price Discrimination effect on users of Freemium services– An initial outline of Game of Chance elements in Japanese F2P mobile games," *14th Asia-Pacific Regional Conference of the International Telecommunications Society (ITS)*, 1–19. https://www.econstor.eu/handle/10419/168503.

Koeder, M., Tanaka, E. and Mitomo, H. 2018. "Exploring the game-of-chance elements in F2P mobile games: Insights of player's emotions from qualitative analysis." *DHU journal*, 5, 16–28.

Li, W., Mills, D. and Nower, L. 2019. "The relationship of loot box purchases to problem," video gaming and problem gambling." *Addictive behaviors*, 97, 27－34.

Telfer, A. 2017. *How to Design a Gacha System*. https://mobilefreetoplay.com/design-gacha-system/

Gartenberg, C. 2018. *Belgium defines video game loot boxes as illegal gambling*. https://www.theverge.com/2018/4/25/17280440/belgium-video-game-loot-boxes-illegal-gambling

Yamaguchi, S. 2013. "Determinants of Payment Behavior and Dependence on Mobile Content: Empirical Analysis of Social Games and Policy Implications." *Information and Communications Policy Review*,7, E1–E23. [in Japanese]

Zendle, D., Meyer, R. and Over, H. 2019. "Adolescents and loot boxes: links with problem gambling and motivations for purchase." Royal Society open science, (66), 190049. https://doi.org/10.1098/rsos.190049

APPENDIX

	F1	F2	F3	F4	F5	F6	F7	GM1	GM2	GM3	GM4	GM5	GM6	GM7	GM8	GM9	GM10	GM11	GM12	GM13	GM14
F1	1.00																				
F2	0.26**	1.00																			
F3	0.24**	0.17*	1.00																		
F4	0.31**	0.38**	0.13	1.00																	
F5	0.19*	0.37**	0.08	0.40**	1.00																
F6	0.35**	0.13	0.28**	0.29**	0.19*	1.00															
F7	0.21**	0.17*	0.12	-0.07	0.10	0.03	1.00														
GM1	**0.22****	0.15	**0.29****	**0.26****	0.17*	0.08	-0.02	1.00													
GM2	0.19*	**0.22****	**0.25****	0.14	0.13	0.12	0.13	0.48**	1.00												
GM3	0.18*	-0.03	**0.32****	0.06	-0.05	0.00	0.07	0.40**	0.35**	1.00											
GM4	0.08	0.02	**0.58****	0.08	0.05	0.09	-0.10	0.35**	0.26**	0.42**	1.00										
GM5	0.06	0.14	**0.22****	0.17*	0.14	0.13	-0.03	0.37**	0.52**	0.20**	0.23**	1.00									
GM6	0.07	**0.25****	0.10	**0.21****	0.17*	0.15	0.02	0.30**	0.50**	0.09	0.16*	0.71**	1.00								
GM7	0.13	**0.39****	0.13	0.13	0.16*	0.00	0.14	0.30**	0.55**	0.08	0.16*	0.57**	0.55**	1.00							
GM8	0.13	**0.43****	0.15	0.14	0.14	0.10	0.15	0.24**	0.51**	0.08	0.07	0.57**	0.54**	0.68**	1.00						
GM9	0.13	**0.42****	0.06	0.02	0.16*	0.00	0.09	0.26**	0.37**	0.02	0.06	0.45**	0.38**	0.62**	0.74**	1.00					
GM10	0.13	**0.47****	0.13	0.16*	0.14	0.04	0.16*	0.25**	0.50**	0.02	0.10	0.53**	0.52**	0.74**	0.78**	0.72**	1.00				
GM11	0.04	**0.43****	0.09	0.13	0.12	0.03	0.06	0.20*	0.47**	-0.02	0.11	0.53**	0.56**	0.74**	0.77**	0.74**	0.85**	1.00			
GM12	0.18*	**0.44****	0.06	0.04	**0.26****	-0.11	0.08	0.31**	0.32**	0.14	0.07	0.33**	0.36**	0.50**	0.49**	0.44**	0.49**	0.44**	1.00		
GM13	0.09	0.16*	0.15	-0.01	-0.10	-0.10	0.01	0.33**	0.37**	0.22**	0.29**	0.34**	0.24**	0.36**	0.35**	0.41**	0.35**	0.35**	0.27**	1.00	
GM14	0.03	**0.21****	0.16*	0.08	0.00	-0.10	-0.03	0.44**	0.32**	0.24**	0.34**	0.35**	0.29**	0.33**	0.38**	0.41**	0.36**	0.35**	0.32**	0.60**	1.00

*$p < .05$, **$p < .01$ ($n = 168$)

Table 5: Correlations between Each Item and Factor

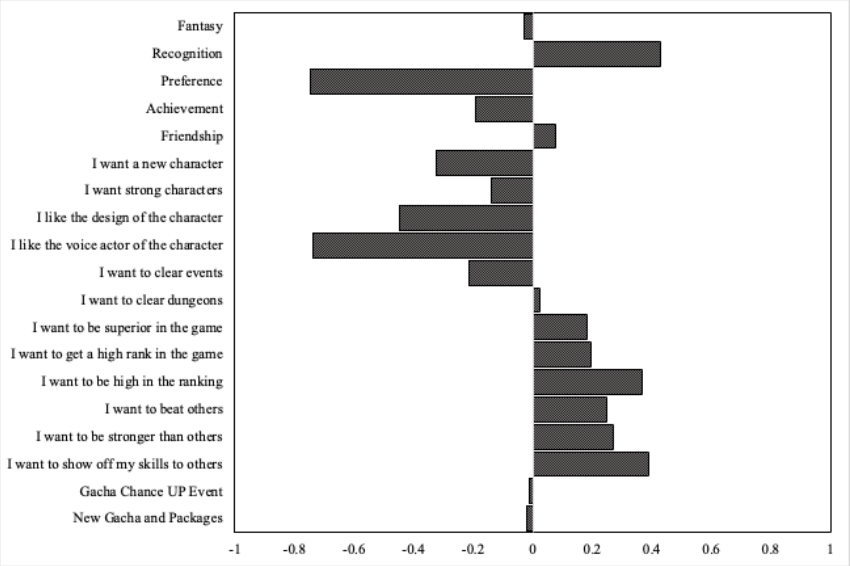

Figure 1: Structural Coefficients of First Canonical Variable λ_1

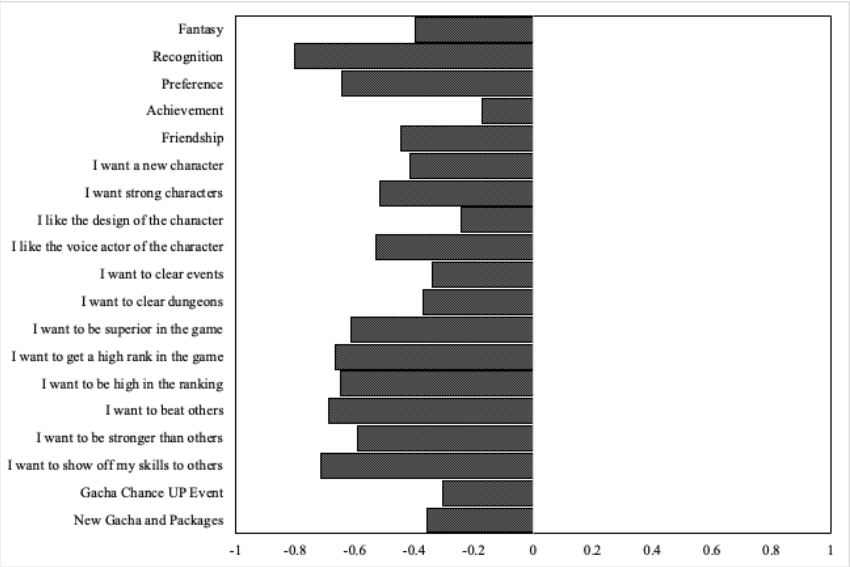

Figure 2: Structural Coefficients of Second Canonical Variable λ_2

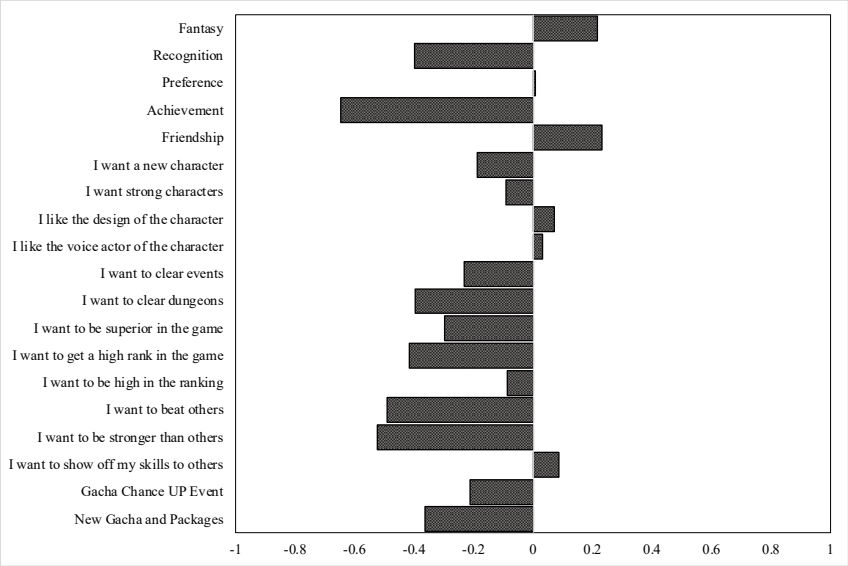

Figure 3: Structural Coefficients of Third Canonical Variable λ_3

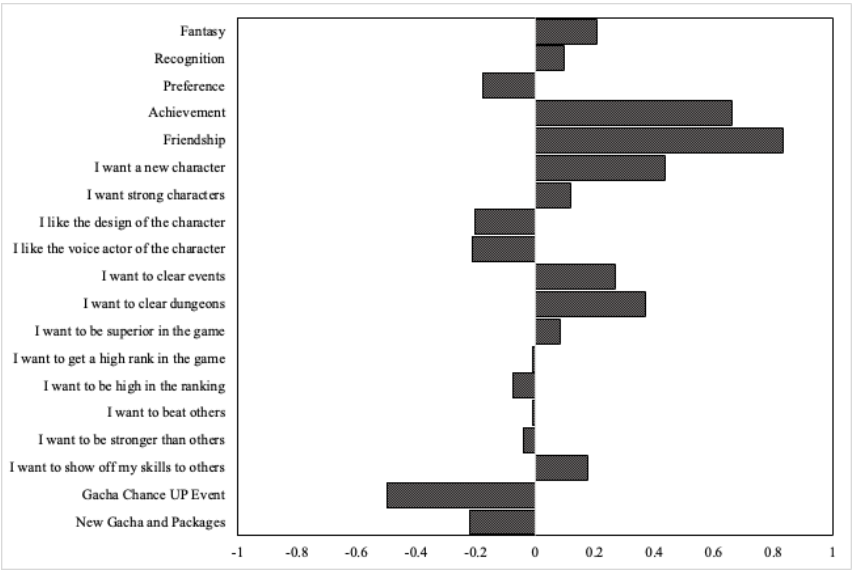

Figure 4: Structural Coefficients of Fourth Canonical Variable λ_4