Pachinko/Pachislot Playing Participation in Japan: Results From a National Survey

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Abstract

To understand individuals' *pachinko/pachislot* playing behaviour, one of the major games in Japan, we conducted a national study of Japanese residents who were between 18 and 79 years old. From resident records, in which all Japanese citizens are registered, 9,000 individuals were chosen by the two-stage stratified random sampling method. A total of 5,060 individuals submitted valid responses (response rate: 56.2%). Results indicated that 582 (11.5%) played pachinko/pachislot in the last 12 months ("past-year players"). Compared with "non-players" (those who never played pachinko/pachislot before or did not play in the last 12 months), past-year players had higher 12-month participation rates in all 10 gambling activities other than pachinko/pachislot. To compare demographic variables between the past-year players and non-players, we performed chi-square tests. Past-year players were more likely to be men in their 30s, junior high school graduates, and earning a similar annual household income to the median value for all respondents. Demographic variables were compared for each participation level and significant differences between age groups were found: Participants in their 60s and 70s visited pachinko/pachislot parlours more frequently than did those in their 20s to 40s. This is the first study to reveal the details of pachinko/pachislot playing behaviour in Japan.

Résumé

Une enquête nationale a été menée auprès de résidents japonais âgés de 18 à 79 ans dans le but d'étudier le comportement des joueurs de pachinko/pachislot, l'un des principaux jeux pratiqués au Japon. À partir du registre de déclaration de résidence, auquel tous les citoyens du pays sont inscrits, 9000 personnes ont été sélectionnées en suivant la méthode d'échantillonnage aléatoire stratifié en deux étapes. Sur ce nombre, 5060 ont donné des réponses valides (taux de réponse : 56,2 %). Selon les résultats, 582 (11,5 %) ont joué au pachinko/pachislot dans les 12 derniers mois («joueurs de l'année précédente»). Comparativement aux «non-joueurs» (à savoir ceux qui n'ont jamais pratiqué ce jeu dans le passé ou au cours des 12 derniers mois), les joueurs de l'année précédente affichent sur 12 mois des taux de participation plus élevés à 10 autres activités de jeux de hasard outre le pachinko/pachislot. Des tests de chi-square ont été réalisés en vue de comparer les variables démographiques entre les joueurs de l'année précédente et les non-joueurs. Les premiers étaient plus susceptibles d'être des hommes dans la trentaine et des diplômés des écoles intermédiaires, dont le revenu familial annuel se rapprochait de la valeur médiane pour l'ensemble des répondants. Les variables démographiques ont été comparées pour chaque niveau de participation, faisant apparaître des différences notables entre les groupes d'âge : les sexagénaires et les septuagénaires fréquentaient les maisons de pachinko/pachislot plus souvent que les générations de la vingtaine à la quarantaine. Cette étude est la toute première à révéler des détails sur les habitudes de jeux de pachinko/pachislot au Japon.

Introduction

Although gambling is illegal in Japan, six exceptions—horse races, bicycle racing, powerboat racing, Auto Race, *Takarakuji* (literally means "lottery"), and the Sports Promotion Lottery (toto)—are legally permitted. Aside from these types of activities, there are games resembling gambling games, although they are not public, called *pachinko* and *pachislot* (Hirano & Takahashi, 2003). They are different from gambling games in the sense that no money is directly bet, but because of how they work, they resemble gambling games. In pachinko and pachislot, players can exchange their winnings—balls and medals, respectively—for prizes of equal value inside the parlour. One of these prizes is a special prize, which can be taken to a local exchange centre outside the parlour and exchanged for cash. In fact, almost 90% to 95% of players choose to exchange their balls or medals for a special prize

(Kaji, 2007). There is thus a mechanism that allows individuals to win cash indirectly by playing pachinko or pachislot, and these games seem to resemble gambling games.

To play pachislot, players first pay money to borrow medals. They put the medals in a machine and press the knob down. The knob movement triggers a lucky draw inside the machine. If players win the lucky draw, they can press the buttons to try to match pictures on reels. They receive different numbers of medals depending on which pictures are matched. Although a pachislot machine differs from an electronic gaming machine (EGM) in that it is equipped with buttons to stop the reels, the two machines are similar because both involve the matching of pictures (Figure 1).

Players pay money to borrow small balls to play pachinko. A pachinko machine looks like a vertical pinball machine. Players pour the balls into the machine and turn a handle to shoot the balls up into the board. Balls fall from the top while running through a maze of pins. Players try to put as many balls as possible in a gate that activates a slot machine. Although players can receive balls if they are successful, a machine opens an even larger gate at a set time that players can take advantage of to win more balls (Brooks et al., 2008; Figure 2).

Although pachinko and pachislot have different machine mechanisms and playing methods, they are similar in that they are machine games and not table games. They are electronically controlled, and the price of balls and medals is legally decided. Many parlours have both pachinko and pachislot machines, and players can play both games in these venues. Furthermore, according to Ziolkowski (2018), pachinko and pachislot machines are defined as gaming machines because of two characteristics: They are designed entirely or partially as chance-based games that require skill in some areas, and they are designed for games that involve payment of money or tokens or that record rights to an equivalent amount of money.

Figure 1
An example of a Pachislot gaming machine at a Pachinko parlour in Japan.

Figure 2
An example of a Pachinko gaming machine at a Pachinko parlour in Japan.

According to some previous studies, however, these characteristics are likely to cause a disorder. Brooks et al. (2008) reported that pachinko is a continuous, rapid, and frequently played game with an element of skill and is more closely connected to problem gambling than are other gambling games. It provides a large number of opportunities to play in a given time period (e.g., a pachislot can play about 15 times per minute.)

Japanese surveys have also reported that individuals spent more money on pachinko or pachislot than on any other gambling games when they gambled most frequently (Cabinet Meeting on Anti-Gambling Addition Measure Promotion, 2017). Spending a lot of money on pachinko or pachislot may harm not only the players themselves, but also their family members, relatives, friends, or work relationships. The impact is serious. There are also non-financial issues. For example, an individual may visit a pachinko/pachislot parlour with his or her child and leave the child inside a car while playing pachinko or pachislot because individuals under 18 years old cannot enter the parlour. The child may suffer heatstroke, resulting in death. Such incidents occur repeatedly and have developed into social issues (Kaji, 2007, 2014).

For pachinko and pachislot that have the characteristics described earlier, only a limited number of studies have been done to clarify how individuals interact with these games. Pachinko/pachislot studies have been conducted in Japan. For example, the Japan Productivity Center publishes the *White Paper on Leisure*, which examines

leisure activities engaged in by 3,000 Japanese residents from 15 to 79 years old. A total of 108 leisure activities are studied and pachinko is one of them. For each leisure activity, the number of participants, annual average activity frequency, annual average spending, and market size are reported every year. Note, however, that the *White Paper* does not provide any further details on playing behaviour, including the amount of investment, amount of loss, or demographic variables of the individuals studied (Japan Productivity Center, 2018).

Another example is the Survey on Time Use and Leisure Activities conducted every 5 years by the Ministry of Internal Affairs and Communications. The survey defines "hobbies and entertainment" as activities that individuals engage in during their free time, not obligatory activities such as work, study, or housework. Hobbies and entertainment are divided into 34 categories, and respondents are asked whether or not they engaged in these activities in the last 12 months. These 34 categories include pachinko, and the 2016 survey reported the percentage of respondents (of 200,000 individuals across the country who were 10 years or older) who had played (Ministry of Internal Affairs and Communications, 2017a). This survey, however, does not provide detailed results on playing behaviour or survey respondents.

Another survey is conducted by an electronic device manufacturer that sells products to pachinko/pachislot parlours. The company reported various data, including the number of active units and the amount of sales (Daikoku Denki Co., Ltd., 2018) from sales data submitted by its contracting companies. Here it should be noted that this report shows the results of tabulation of sales data collected from each parlour. Although it allows estimation of sales and playing time nationwide, unclarified attributes of individuals and inadequate sampling quality pose problems because contracting companies are the only source of data.

For this reason, in the present study, we studied playing behaviour in detail, analysed demographic variables of the study participants, and conducted a national survey of participants sampled by an appropriate method. We aimed to discuss how individuals interact with pachinko/pachislot in Japan by (1) examining pachinko/pachislot playing behaviour and (2) comparing pachinko/pachislot participation in Japan and gambling participation in other countries.

Method

Participants

A total of 5,060 participants submitted valid responses (2,400 men and 2,660 women) in January to February, 2017.

Sampling

To study 9,000 individuals, we performed two-stage stratified random sampling. First, we divided the population of Japanese residents between 18 and 79 years old as

of January 2016 according to the Basic Resident Register (a municipality-based resident record collection that registers all Japanese residents) across the country into 44 strata, that is, four population strata each divided into 11 regional strata. Use of the Basic Resident Register can reduce the coverage error, which indicates a difference between the population and the sampling frame. Second, we defined "a location" as an area that can be covered by a door-to-door investigator and decided to have 25 such investigators. As a result, there were 360 locations (9,000 divided by 25). We proportionally distributed these 360 locations into the 44 strata on the basis of their population ("stratification"). Third, we randomly sampled locations in each stratum across the country. Finally, we randomly sampled 25 residents from each location by using the Basic Resident Register (two-stage stratified random sampling). This sampling method is very common in Japanese social surveys and is considered to be an excellent technique. The number of valid responses was 5,060 (56.2%).

Procedure

We first sent out postcards with a request for survey participation to the sampled individuals. A package with a hard copy questionnaire and a document about online participation was then mailed to them. After offering participants the option of responding by mail or online, door-to-door investigators visited them to request their participation. Responses could be delivered online, by returning the questionnaire by mail, or by handing the questionnaire to a door-to-door investigator. This procedure is the standard social survey method in Japan, called the "drop-off and pick-up method," but with the addition of a pre-posting step (Fukuda, 2009; Jackson-Smith et al., 2016). Respondents who submitted answers received a 1,000-yen prepaid card as a reward. This survey was performed while hiding its actual purpose—to examine gambling or pachinko/pachislot playing behaviour—in order to prevent bias regarding the rate of reporting by participants who had pachinko/pachislot experience. This study was approved in advance by the Ethics Committee of the first author's university.

Measures

Demographic Variables

Gender, age group, education, annual income, and place of residence were used in our analysis. The Basic Resident Register was used to obtain information on the gender and age of the participants. Age was stratified into age groups in 10-year increments.

Participants indicated their level of education as either *junior high school, senior high school, vocational training school or 2-year college,* and *university or graduate school*.

For annual household income, defined as the annual income made by family members, the participants selected from 14 categories from *less than a million yen* to *13 million yen or more* divided by increments of a million yen. For the purpose of

analysis, these categories were integrated into four categories: less than 3 million yen, 3 million to less than 5 million yen, 5 million to less than 8 million yen, and 8 million yen or more.

Place of residence was divided into four categories by size: *major city/Tokyo 23 ward*, *city with population of 150,000 or more*, *city with population under 150,000*, and *town/village*. Categorization was based on data provided by local governments randomly selected in the first stage of the two-stage stratified random sampling.

Pachinko/Pachislot Experience

The participants reported their past pachinko/pachislot experience by using a 3-point scale that included *once a week or more*, *less than once a week*, and *never played before*. For those who had played before, we asked when they last played. Participants used a 7-point scale from *5 years ago or before* to *less than a month ago* to provide the answer.

Past Public Sports and Lottery Experience

The participants reported their past experience of playing the nine types of public sports and lotteries by using a 3-point scale that included *once a week or more*, *less than once a week*, and *never played before*.

Pachinko/Pachislot Participation Levels

For those who played pachinko less than a year ago, we measured four types of participation levels.

Frequency. The frequency of going to a pachinko/pachislot parlour was measured by using a 9-point scale from *less than once a year* to *four times a week or more*.

Time. The average amount of time spent playing pachinko/pachislot in a day for the last 12 months was measured by using a 9-point scale from *less than an hour* to *8 hours or longer*.

Wager. The average amount of money invested in pachinko/pachislot per month for the last 12 months was measured by using a 9-point scale from *5,000 yen or less* to *over 200,000 yen*. For example, if 10,000 yen in cash was invested, the wager would be 10,000 yen regardless of the amount of wins or losses.

Loss. The average amount of loss per month for the last 12 months was measured by using a 10-point scale from *no losses* to *over 200,000 yen*. For example, if 10,000 yen in cash was invested and a player ended up with 8,000 yen, the loss would be 2,000 yen.

Analyses

Participation Rates

The percentage of respondents who participated in pachinko/pachislot was calculated with 5,060 as the denominator, which was the number of all participants, including those who did not respond. The gender-specific participation rates were obtained by using the denominator 2,400 for men and 2,660 for women, including those who did not respond. The category-specific participation rates for age group, education, annual household income, and place of residence were also calculated by using the number of all respondents in each category.

Distribution of Past-Year Players by Demographic Variable

Chi-square tests were performed to identify any biases in distributions of past-year players and non-players for each demographic variable, which included gender, age group, education, annual household income, and place of residence. Data from individuals who did not respond were excluded from analysis. The demographic variables were adjusted based on population statistics. Gender and age group were adjusted based on the 2017 population estimated from the Population Census that is conducted every 5 years (Ministry of Internal Affairs and Communications, 2018b). To adjust education, we used data from the 2017 Employment Status Survey issued by the Bureau of Statistics (Ministry of Internal Affairs and Communications, 2018a). We referred to the 2016 Overview of the National Livelihood Survey to adjust the annual household income (Ministry of Health, Labour and Welfare, 2018). Finally, we adjusted residence by using the values in the 2015 Population Census (Ministry of Internal Affairs and Communications, 2017b).

Comparison of Participation Levels by Demographic Variable

We examined whether the four types of participation levels (frequency, time, wager, and loss) of past-year players differed by demographic variable, which included gender, age group, education, annual household income, and place of residence. The Mann-Whitney *U* test was used for gender and the Kruskal-Wallis test for other demographic variables.

Results

Pachinko/Pachislot Participation Rate

Among the 5,060 respondents, 582 (11.5%) played pachinko/pachislot in the last 12 months (past-year players), 4,457 (88.1%) had never played pachinko/pachislot before or did not play in the last 12 months (non-players), and 21 did not provide an answer.

Rates of Participation in Other Gambling Activities

Table 1 shows the rates of participation in other gambling activities by past-year players and non-players. Among the past-year players, Takarakuji had the highest participation rate of 39.5%, followed by horse racing, accounting for 17.4%.

Among the non-players, Takarakuji and LOTO accounted for a 31.4% and 8.7% participation rate, respectively. Compared with non-players, past-year players had higher participation rates in all gambling activities.

Pachinko/Pachislot Participation Rate of Past-Year Players and Their Distribution by Demographic Variable

Gender

The percentage of past-year players was calculated for each gender. As seen in Table 2, male and female past-year pachinko/pachislot players accounted for 18.3% and 5.4% of all participants, respectively.

Furthermore, a χ^2 test was conducted to find any distribution biases between genders for past-year players and non-players. The result was significant at a level of 0.1% ($\chi^2 = 206.332$, $df = 1$, $n = 5,039$, $p < .001$, Cramer's $V = .20$). Examination of the adjusted standardized residuals indicated that the number of men was significantly high among the past-year players.

Age Group

The percentage of past-year players was calculated for each age group. As seen in Table 2, it was the highest in the 30s; 15.8% of respondents in this age group were past-year players.

Table 1

Gambling Participation Rates (%) for the Last 12 Months for Past-Year Players and Non-players

Type of gambling	Past-year players (%) (n = 582)	Non-players (%) (n = 4,457)
Horse racing	17.4	5.5
Bicycle racing	4.0	0.8
Powerboat racing	5.3	1.2
Auto Race	2.1	0.4
Takarakuji	39.5	31.4
Numbers	12.4	6.5
LOTO	13.7	8.7
Sports Promotion Lottery	8.4	3.6
Casino	2.7	0.8

Table 2

Twelve-Month Gambling Participation Rates (%) by Demographic Variable and Past-Year Player and Non-player Distributions

Demographic variable[a]	Total	Past-year players		Non-players		N/A	
	n	n	(%)	n	(%)	n	(%)
Total	5,060	582	(11.5)	4,457	(88.1)	21	(0.4)
Gender							
Male	2462.19	450.38***	(18.3)	1996.43	(81.1)	15.39	(0.6)
Female	2597.81	139.66	(5.4)	2452.29***	(94.4)	5.86	(0.2)
Age group							
Teens	128.54	7.49	(5.8)	121.06***	(94.2)	0.00	(0.0)
20s	654.11	83.79	(12.8)	567.62	(86.8)	2.70	(0.4)
30s	783.60	123.95***	(15.8)	658.57	(84.0)	1.08	(0.1)
40s	987.60	116.01	(11.7)	870.58	(88.2)	1.01	(0.1)
50s	822.95	97.34	(11.8)	725.61	(88.2)	0.00	(0.0)
60s	926.25	112.17	(12.1)	811.60	(87.6)	2.47	(0.3)
70s	756.95	45.96	(6.1)	697.86***	(92.2)	13.13	(1.7)
Education							
Junior high school	815.11	136.51***	(16.7)	669.32	(82.1)	9.28	(1.1)
Senior high school	1935.96	245.54	(12.7)	1682.60	(86.9)	7.83	(0.4)
Vocational training school/2-year college	913.94	76.98	(8.4)	834.27***	(91.3)	2.69	(0.3)
University/graduate school	1094.99	102.33	(9.3)	991.71***	(90.6)	0.96	(0.1)
Annual household income							
Less than 3 million yen	1192.14	128.56	(10.8)	1059.68	(88.9)	3.90	(0.3)
3 million to less than 5 million yen	844.88	109.58*	(13.0)	731.95	(86.6)	3.35	(0.4)
5 million to less than 8 million yen	816.24	97.63	(12.0)	717.73	(87.9)	0.88	(0.1)
8 million yen or more	723.16	59.93	(8.3)	663.23*	(91.7)	0.00	(0.0)
Place of residence							
Major city/Tokyo 23 ward	1463.92	156.81	(10.7)	1299.43	(88.8)	7.68	(0.5)
City with population of 150,000 or more	1565.83	161.81	(10.3)	1399.93	(89.4)	4.10	(0.3)
City with population under 150,000	1594.00	199.60	(12.5)	1386.09	(87.0)	8.32	(0.5)
Town/village	436.25	60.20	(13.8)	375.12	(86.0)	0.93	(0.2)

Note. N/A = not available.

[a] The demographic variables were adjusted on the basis of the population statistics.

Values were significantly higher than the expected values as a result of residual analysis. $*p < .05$, $***p < .001$.

A χ^2 test of past-year players and non-players for each age group was then performed. The calculation resulted in statistical significance at a level of 0.1% ($\chi^2 = 40.425$, $n = 5,039$, $df = 6$, $p < .001$, Cramer's $V = .09$). Examination of the adjusted standardized residuals that followed showed that, compared with the number of non-players, the number of past-year players was significantly high among those in their 30s and significantly low among those in their teens and 70s.

Education

The percentage of past-year players was calculated for each education level. As seen in Table 2, it was the highest for the junior high school level; 16.7% of respondents who were junior high school graduates were past-year players.

A χ^2 test of past-year players and non-players for each education level was performed. The result indicated statistical significance at a level of 0.1% ($\chi^2 = 38.077$, $df = 3$, $n = 4,741$, $p < .001$, Cramer's $V = .09$). The adjusted standardized residuals were then examined and showed that the number of past-year players whose final education was junior or senior high school was significantly higher than it was for non-players, but the number of past-year players whose final education was vocational training school, 2-year college, university, or graduate school was significantly lower than it was for non-players.

Annual Household Income

The percentage of past-year players was calculated for each annual household income range. As seen in Table 2, it was the highest in the 3 million to less than 5 million yen income range; 13.0% of respondents within this range were past-year players.

A χ^2 test of past-year players and non-players for each annual household income range was then performed. It resulted in statistical significance at a level of 5% ($\chi^2 = 9.681$, $df = 3$, $n = 3,572$, $p < .05$, Cramer's $V = .05$). Examination of the adjusted standardized residuals indicated that, compared with the number of non-players, the number of past-year players was significantly higher in the 3 million to less than 5 million yen income range but significantly lower in the 8 million yen or more income range. Since the median range for annual household income for all 5,060 participants was 4 million to less than 5 million yen, many past-year players fell in approximately the same income range as the median range for all participants.

Place of Residence

The percentage of past-year players was calculated for each place of residence. As seen in Table 2, it was highest in the town/village category, accounting for 13.8% of respondents within this category.

A χ^2 test of past-year players and non-players for each place of residence category was performed, but no statistically significant difference was indicated ($\chi^2 = 6.931$, $df = 3$, $n = 5,039$, ns).

Comparison of Participation Levels by Demographic Variable

We conducted an additional analysis only for past-year players by using four pachinko/pachislot participation levels as dependent variables. First, we obtained median values for each type of participation level. The median values for the frequency of going to a pachinko/pachislot parlour was two to three times/month, time spent playing was 3–4 hours, the amount spent was 10,000–20,000 (JPY), and the amount of loss was 5,000–10,000 (JPY) (Table 3).

Next, for each of the four pachinko/pachislot participation levels, the demographic data of past-year players was compared for each variable: gender, age group, education, income, and place of residence (Table 3). The result for each independent variable is as follows.

Gender

There were no significant gender differences for all participation levels (frequency: Mann-Whitney $U = 28767.5$, ns; time: $U = 29522.0$, ns; wager: $U = 27880.0$, ns; loss: $U = 28751.0$, ns).

Age Group

Significant age-group differences were found in the frequency of going to a pachinko/pachislot parlour (Kruskal-Wallis test, $\chi^2 = 31.613$, $df = 6$, $p < .001$, $\eta^2 = .05$). The Bonferroni multiple comparison test indicated a higher frequency for those in their 60s and 70s than for their counterparts in their 20s, 30s, or 40s. There were no significant age-group differences for any other participation levels (Kruskal-Wallis test, time: $\chi^2 = 11.364$, $df = 6$, ns; wager: $\chi^2 = 2.876$, $df = 6$, ns; loss: $\chi^2 = 10.081$, $df = 6$, ns).

Education

Education did not make any difference for any participation levels (Kruskal-Wallis test, frequency: $\chi^2 = 2.811$, $df = 3$, ns; time: $\chi^2 = 4.917$, $df = 3$, ns; wager: $\chi^2 = 2.209$, $df = 3$, ns; loss: $\chi^2 = 1.964$, $df = 3$, ns).

Annual Household Income

No significant annual household income differences were found for any participation levels (Kruskal-Wallis test, frequency: $\chi^2 = 2.811$, $df = 3$, ns; time: $\chi^2 = 4.917$, $df = 3$, ns; wager: $\chi^2 = 2.209$, $df = 3$, ns; loss: $\chi^2 = 1.964$, $df = 3$, ns).

Table 3
Median Pachinko/Pachislot Participation Levels by Demographic Variable for Past-Year Players

Demographic variable	Participation level (median value)			
	Frequency	Time (hr)	Spending (JPY)	Loss (JPY)
Past-year players	2–3 times/month	3–4	10,000–20,000	5,000–10,000
Gender				
Male	2–3 times/month	3–4	10,000–20,000	5,000–10,000
Female	2–3 times/month	3–4	10,000–20,000	5,000–10,000
Age group				
Teens	2–3 times/month	2–3	20,000–40,000	No losses
20s	Once a month***	3–4	5,000–10,000	5,000–10,000
30s	2–3 times/month***	3–4	10,000–20,000	5,000–10,000
40s	2–3 times/month***	3–4	10,000–20,000	5,000–10,000
50s	2–3 times/month	3–4	10,000–20,000	5,000–10,000
60s	Once a week***	2–3	10,000–20,000	5,000–20,000
70s	Once a week***	2–3	10,000–20,000	10,000–20,000
Education				
Junior high school	2–3 times/month	2–3	10,000–20,000	5,000–10,000
Senior high school	2–3 times/month	3–4	10,000–20,000	5,000–10,000
Vocational training school/2-year college	2–3 times/month	3–4	10,000–20,000	5,000–10,000
University/graduate school	2–3 times/month	2–3	10,000–20,000	5,000–10,000
Annual household income				
Less than 3 million	2–3 times/month	3–4	10,000–20,000	5,000–10,000
3 million to less than 5 million	2–3 times/month	2–3	10,000–20,000	10,000–20,000
5 million to less than 8 million	2–3 times/month	3–4	10,000–20,000	5,000–10,000
8 million or more	2–3 times/month	2–3	10,000–20,000	10,000–20,000
Place of residence				
Major city/Tokyo 23 ward	2–3 times/month	3–4	10,000–20,000	5,000–10,000
City with population of 150,000 or more	2–3 times/month	3–4	10,000–20,000	5,000–10,000
City with population under 150,000	2–3 times/month	3–4	10,000–20,000	5,000–10,000
Town/village	2–3 times/month	3–4	10,000–20,000	10,000–20,000

***$p < .001$ indicates a significant difference between categories.

Place of Residence

Place of residence produced no significant differences in participation levels (Kruskal-Wallis test, frequency: χ^2 = 7.454, *df* = 3, *ns*; time: χ^2 = 2.835, *df* = 3, *ns*; wager: χ^2 = 2.473, *df* = 3, *ns*; loss: χ^2 = 5.369, *df* = 3, *ns*).

Discussion

Pachinko/Pachislot Playing Behaviour

Past-year players, defined as those who played pachinko/pachislot in the last 12 months, accounted for 11.5% of all participants. Since the 18- to 79-year-old Japanese population as of the base sampling date was 96,337,130, we estimated that there were 11 million past-year players in the general population. We also found that past-year pachinko/pachislot players had higher rates of participation in public sports and lotteries.

The distribution of past-year players suggested that, unlike the non-players, many were men in their 30s, were junior high school graduates, and fell in the annual household income range of 3 to 5 million yen. Comparison of their income with the median value for the 5,060 study participants suggested that many past-year players had a standard annual household income.

Regarding participation levels, median values for past-year players were two to three times a month for frequency, 3 to less than 4 hours for the time spent on playing, more than 10,000 to 20,000 yen for the wager, and losses of more than 5,000 to 10,000 yen.

When demographic data were compared within each variable for each participation level, the past-year players in their 60s and 70s went to a pachinko/pachislot parlour more frequently than did their counterparts in their 20s to 40s.

Comparison With Gambling Participation in Other Countries

Ziolkowski (2018) defined pachinko and pachislot machines as gaming machines similar to slot machines, video lottery terminals, and video gaming machines because of their characteristics and stated that slot machines fell into the same category as fruit machines, pokies, and jackpot machines. On the basis of this notion, we compared player participation rates and wagers between pachinko and pachislot machines, EGMs, slot machines, and jackpot machines.

Gambling Participation Rate

According to a study by the University of Macau (2016) on the gambling participation rate of Macanese residents, 6.5% responded that they had played a slot machine in the past year. The National Council on Problem Gambling (2018)

reported that, in a 2017 study of Singaporean residents, 1% of them had played a jackpot machine at a local casino, 1% at a local club, and 2% during a cruise or outside Singapore in the past year. Williams et al. (2013) conducted a survey of Korean residents in 2011 and reported that 0.4% of them had played a slot machine at a casino in the past year. In a 2011–2013 gambling participation study by Welte et al. (2015), 17.4% of all study participants living in the United States had played a slot machine (but not at a casino) in the past year. Furthermore, the 2010–2011 study suggested that 19.43% of Australian residents had played an EGM in the past year, and a 2012 study reported that 8.4% of residents of New Zealand had played an EGM at a casino, 12.2% at a pub, and 5.7% at a club in the past year (Abbott et al., 2014; Armstrong et al., 2018). In our study, 11.5% of all respondents said they had played pachinko/pachislot in the past year. Compared with that of the three Asian countries and regions, the rate of pachinko/pachislot participation by Japanese residents was higher, although participation in gambling is controlled in Korea and Singapore, possibly influencing the participation rate of each country. More specifically, Korea has only one casino accessible to Korean residents, and Singaporean residents must pay an expensive admission fee and pass a strict ID check to gamble. Nevertheless, the rate of pachinko/pachislot participation by Japanese residents was the fourth highest after the pub-based EGM participation rates by Australian, American, and New Zealand residents. The Japanese pachinko/pachislot participation rate may be heightened by the fact that Japanese pachinko/pachislot parlours are admission free and highly accessible, being located everywhere across the country.

Gender Differences in Gambling Participation Rates

In New Zealand, there was no gender difference in the EGM playing rate (Abbott et al., 2014). In Japan, on the other hand, more men than women played pachinko/pachislot. However, we found no gender differences among past-year players in any of the participation levels. This means that, despite there being no gender differences in playing behaviour, there were large differences in the phase prior to that when individuals decided whether or not they would play. This seems to be a characteristic of pachinko/pachislot playing behaviour in Japan.

Traditionally, a game hall was considered to be "the men's place" and women would feel unwelcome. Similar opinions were still present in studies conducted in the 2000s (Entertainment Business Institute Co., Ltd., 2004; Yamada & Imaizumi, 2002). According to a study by the Japan Federation of Game Business Cooperatives (2017), in half of the cases, individuals entered a game hall for the first time with their friends or acquaintances who invited them. This led us to speculate that the flow of male players inviting new male players has been maintained and expressed in the different participation rates between genders.

Gambling Participation Rates by Income

The New Zealand study found that the general gambling participation rate was proportional to income level. The rate of participation in non-casino EGM games,

however, was higher for the low-income population. Furthermore, the preferred type of gambling varied by income group: The high-income population preferred horse races and dog races, whereas the low-income population preferred non-casino EGM games (Abbott et al., 2014). In Japan, the rate of pachinko/pachislot participation was higher for individuals whose annual household income was roughly the same as the median value. This finding suggests that pachinko/pachislot is a type of entertainment for the middle-class and that there were almost no differences in participation rates by the financial standing of individuals.

Comparison of Wagers

We compared wagers on gambling activities in the past year between countries. In Macau, the median value for monthly wagers on slot machines was 200 MOP (approximately 3,000 JPY). In New Zealand, the average monthly wager on casino EGMs was 52.28 NZD (approximately 4,000 JPY) and the average monthly wager on non-casino EGMs was 48.9 NZD (about 3,700 JPY; Abbott et al., 2014; University of Macau, 2016). In Australia, the average annual participant expenditure on EGMs was 3,817 AUD (about 313,000 JPY), which was 318 AUD (about 26,000 JPY) per month (Armstrong et al., 2018). Our study showed that the median value for a monthly wager on pachinko/pachislot per past-year player fell in the range of more than 10,000 to 20,000 yen.

According to the International Labour Organization ILOSTAT database (2018), the average monthly income in the year (or near the year) in previous studies was 15,000 MOP in Macau (2016), 4,420 NZD in New Zealand (2014), 5,528 AUD in Australia (2014), and 304,000 JPY in Japan (2016). The wager represented the following percentages of the monthly income: 1.3% in Macau, 1.2% for casino EGMs and 1.1% for non-casino EGMs in New Zealand, 5.8% in Australia, and between 3.3% and 6.6% in Japan if the monthly wager on pachinko/pachislot was in the range of more than 10,000 to 20,000 yen. Although a study limitation was that the expenditures in Australia and New Zealand were average values and the expenditures in Macau and Japan (in the present study) were median values, the wager on pachinko/pachislot in Japan could nonetheless be estimated to be higher than New Zealand and Macau but about the same level as Australia.

Representativeness of the Sample

In this study, we used a low-coverage error sampling method. To collect survey responses, we offered multiple response options such as sending by mail or via the website in addition to the drop-off and pick-up method. As a result, the valid response rate was 5 percentage points higher (56.2%) than a well-known Japanese social survey (Nakamura et al., 2015; Shirahase, 2018). Therefore, a low-coverage error sampling method and multiple response options were adopted to increase the response rate, and we believe that the maximum representativeness of the sample was secured.

Conclusion

In the present study, we conducted a pachinko/pachislot survey of a general population sampled from across Japan. Examination of the pachinko/pachislot participation rate and the characteristics of past-year players led us to identify their playing behaviour. The study results showed that past-year players were often men in their 30s with low education and an average annual income, who had a high participation rate in other types of gambling activities. This finding suggests that these players constitute a group prone to the risks of problem gambling, and active interventions and awareness-raising programs would effectively prevent them from problem gambling. These interventions and programs should encourage players to engage in a responsible play style or recommend seeking treatment when they have problems.

Although previous studies have uncovered gambling behaviour in various countries, no detailed examinations have been reported for playing behaviour in Japan. The present study was designed to accomplish such a detailed examination.

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