

Examining machine gambling in the British Gambling Prevalence Survey



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Executive Summary

This report has been produced to explore machine gambling in more depth using the British Gambling Prevalence Survey series. It aims to examine how machine play has changed over time and what different types of machine players exist.

The report was commissioned by the Gambling Commission in spring 2012 to inform the then-forthcoming triennial review of gaming machines stake and prize levels, to provide context and information for the Department of Culture, Media and Sport (DCMS) and for the Responsible Gambling Strategy Board's (RGSB) input to that consultation. RGSB will find this report useful to inform its broader understanding of the characteristics of gaming machine players. It provides helpful context for RGSB's Machines Expert Group which works closely with the Responsible Gambling Trust to better understand what might help reduce gambling-related harm among machine players.

Gambling machines have been the subject of intense scrutiny, which has increased since the commissioning of this report. However, little empirical information about the profile of those who play machines or how machine players may vary from one another is available. This report aims to fill that gap using evidence from the British Gambling Prevalence Survey series. Main aims were:

- a) to assess how patterns of machine play have changed since 1999, and
- b) to explore whether different types of machine player exist and, if so, to examine their profile, behaviour, motivations and attitudes.

Key findings are summarised below.

Slot machines:

- The definition of slot machines used in this report is the same as that used in the main British Gambling Prevalence Survey series. Since 2007, this has excluded any machine played in bookmakers.¹

¹ In 1999, the questionnaire asked about play of slot/fruit machines in any venue, including bookmakers, as this was prior to the introduction of what was (then) called 'fixed odd betting terminals'. In 2007 and 2010, the questionnaire was updated and information about playing machines in bookmakers was collected separately to playing on slot machines in other venues. See Wardle et al., 2011 for further details.

- Since 1999, prevalence of past year participation on slot machines has decreased among men but increased among women. Similar patterns were observed among past week play.
- The sharpest decrease in past week slot machine play was among men aged 16-34. Estimates fell from 12% in 1999 to 5% in 2010.
- The profile of slot machine players in 2010 was different to that observed in previous years. The gap between men and women narrowed, they were somewhat older and tended to be in lower income groups.
- In 2010, slot machine players were more engaged in gambling generally and in machine gambling specifically than previously. In 2007, 15% of slot machine players gambled at least once a week. This increased to 21% in 2010.

Machines in a bookmakers office:

- The definition of playing machines in a bookmakers used in this report is any reported play of machines whilst in a bookmakers regardless of which games were played on the machine. This is the same definition which has been used in the BGPS series to look at trends over time.
- Prevalence of past year participation on bookmakers' machines has increased since 2007. Greatest increases were observed among men aged 16-34, where past year estimates increased from 9% in 2007 to 14% in 2010.
- The profile of people who played machines in bookmakers remained similar in 2007 and 2010, though the gap between men and women widened, the age profile became younger and a greater proportion were from lower income groups, though this was related to age.
- In both survey years, those who played machines in bookmakers were very engaged in both gambling generally and machines gambling specifically. In 2010, 73% of this group had gambled at least once a week.
- Bookmaker machine players showed higher levels of gambling engagement than slot machine players. 35% of bookmakers' machine players had played machines at least once a week. The equivalent estimate among slot machine players was 21%.

Machine player types

- Using 2010 data, five distinct groups of machine players were identified through statistical analysis. These were: those who mainly played in pubs, those who only played in amusement arcades, those who mainly played in bookmakers, those who played in other venues and those who played in multiple venues.
- **Mainly pub machine players** were male, younger and consumed higher levels of alcohol. Compared to other machine players, they were more likely to have

somewhat lower levels of engagement with gambling generally. This was the largest group of machine players (46%).

- **Amusement arcade only players** were disproportionately female, older, and compared with other machine players generally less engaged in gambling overall. They typically held negative attitudes towards gambling and had started to gamble at a younger age (under 16). 19% of machine players were in this group.
- **Mainly bookmakers machine players** were male and, compared with other machine players, were more likely to be from non-white ethnic groups and to have started gambling at a later age (16 or over). This group had high levels of involvement with gambling generally and machine gambling specifically, as well as more positive attitudes towards gambling. This group accounted for 14% of machine players.
- **Other venue machine players** were a catch-all group for players who were not elsewhere categorised. This included those who played machines in a bingo hall and/or at a casino. Their profile varied, being more likely to be female and from non-white ethnic groups than other machine players. 12% of machine players were in this group.
- **Multi-venue machine players** were generally male and compared with other machine players, were more likely to be younger, not in paid work and to have started gambling at an earlier age. They held the most positive attitudes towards gambling and along with mainly bookmaker machine players had high levels of involvement with gambling generally. Problem gambling status also positively predicted membership of this group. The odds of being a multi-venue machine player were 6.5 times higher among problem gamblers. This was the only group where this association was observed.

Overlaps in machine play

- The existence of a multi-venue machine player group shows that overlaps in types of machines and venue of play exist, though there is some evidence that this is changing.
- In 2010, 18% of slot machine players had also played machines whereas in 2007 only 13% reported the same.
- Among bookmaker machine players the converse was true, with participation in slots among this group falling from 73% in 2007 to 62% in 2010. Whilst this illustrates a great deal of overlap in behaviour, it also shows the increasing proportion of machine players interested in playing machines in bookmakers alone.
- These patterns were specifically observed among younger men, with the steepest rates of decrease in slot machine play being seen among those aged

16-34 and the greatest increase in bookmaker machines play being evident among this age group.

Recommendations

- Continued attention to the changing profile of slot machine players is warranted. For example, the increase in proportion of past year slot machine gamblers among the lowest income group should be monitored as income is a risk factor for the experience of gambling-related harm.
- The changing profile of those who play machines in bookmakers has some (potentially) important implications for responsible gambling strategies. Typically, people who are younger, receive lower incomes or who are unemployed are more vulnerable to gambling-related harm. This corresponds to the changing profile of this group. That said, data showed there were some notable reductions in endorsement of certain types of gambling problems. Further monitoring of this changing profile should be made to assess *if* this translates into increased risk of harm.
- 'Multi-venue' machine players can be viewed as a group at greater risk of experiencing gambling-related harm. This suggests that a joined up, cross-operator and venue approach to the development of strategies aimed at preventing gambling-related harm would be beneficial.

1 Report and analytic conventions

The following conventions are used in this report:

- Unless otherwise stated, the tables are based on the responding sample for each individual question (i.e. item non-response is excluded). Therefore bases may differ slightly between tables.
- The group to whom each table refers is shown in the top left hand corner of each table.
- The data used in this report have been weighted. Both weighted and unweighted base sizes are shown at the foot of each table. The weighted numbers reflect the relative size of each group of the population, not the number of interviews achieved, which is shown by the unweighted base.
- The British Gambling Prevalence Survey series uses a stratified and clustered sample design. These complex sample design features have been taken into account in analysis through using the complex survey module in PASW v18 and/or the survey commands in Stata. In all cross tabulations, an adjusted Wald's F test was used to test for statistically significant differences in variables.
- The following conventions have been used in the tables:
 - No observations (zero values)
 - 0 Non-zero values of less than 0.5% and thus rounded to zero
 - [] An estimate presented in square brackets warns of small sample base sizes. If a group's unweighted base is less than 30, data for that group are not shown. If the unweighted base is between 30-49, the estimate is presented in square brackets.
 - * Estimates not shown because base sizes are less than 30.
- Because of rounding, row or column percentages may not exactly add to 100%.
- A percentage may be presented in the text for a single category that aggregates two or more percentages shown in the table. The percentage for that single category may, because of rounding, differ by one percentage point from the sum of the percentages in the table.
- Some questions were multi-coded (allowing the respondent to give more than one answer). The column percentages for these tables sum to more than 100%.

- The term 'significant' refers to statistical significance (at the 95% level) and is not intended to imply substantive importance.
- Only results that are significant at the 95% level are presented in the report commentary, though all results are presented in the tables. Readers should therefore be guided by the commentary to identify statistically significant results. Where appropriate, footnotes have been added to the base of tables to highlight this to readers.

2 Introduction

Slot machines are one of the most popular forms of gambling today. Only lotteries, scratchcards and betting on horse races are more popular. In 2010, 13% of adults (aged 16 and over) had gambled on slot machines in the past year. In the early 2000's, a new type of machine, the (then called) fixed-odds betting terminal, was introduced into bookmakers. Although the impact of slot machines upon gambling behaviour had attracted much attention prior to this, since the introduction of these machines in bookmakers this interest has (arguably) increased, attracting a great deal of interest from a range of stakeholders. This includes focus on whether machines are clustering in certain areas and whether machines are associated with greater levels of gambling-related harm or not.

The rhetoric surrounding machine gambling (especially by media) tends to assume that machine gamblers are a relatively homogenous group and have similar levels of risk of harm. However, the British machine gambling market is diverse and therefore one would expect the profile and behaviour of machine players to be equally diverse. To date, there has been very little exploration of this and what research has been conducted was qualitative in nature. This report aims to address this gap as little is known about the profile of people who play machines, how engagement with machine gambling has changed and how machine players may vary from one another.

The British Gambling Prevalence Survey (BGPS) 2010 is the third study of its kind to be conducted in the last 12 years; previous surveys were carried out in 1999 and 2007. It therefore provides the opportunity to examine (any) changes in machine gambling by survey year. In 2010, further questions were added to collect greater detail about the location where people played machines. New questions about gambling motivations and gambling volume were also included. To date, this additional data has not been specifically examined among machine players.

The purpose of this report was to use data from the BGPS series to fully examine:

- a) how patterns of machine play have changed since 1999, and
- b) whether different types of machine players exist and, if so, to explore their profile.

This report is divided into two parts. Part 1 examines changes in machine play and profile of machine players across the BGPS series. Results are outlined in Chapter 3.

Part 2 uses 2010 data only to examine sub-groups of machine players, their profile, behaviour, motivations and attitudes. Results are summarised in Chapter 4.

3 Changes in machine gambling across the BGPS series

This chapter looks at:

- Participation in machine gambling by survey year.
- The profile of machine gamblers by survey year.
- Levels of involvement in other forms of gambling among machine players by survey year.

In this chapter two groups of machine players are considered: those who played slot machines in venues other than bookmakers and those who played machines in bookmakers. This distinction is made as a consequence of the BGPS questionnaire design as in 2007 and 2010 data about play of machines in bookmakers was collected separately from other slot machine play.² However, such a distinction is useful given that the former have attracted the most attention in recent months and it is of interest to numerous bodies (such as the Department for Culture, Media and Sport and the Responsible Gambling Strategy Board) to explore the evidence separately for this type of machine play. This distinction also provides groups whose definitions are comparable over time so that comparisons can be made across the BGPS series. However, we recognise that in making this distinction, the slot machine category includes machine play conducted in a range of venues and across a range of machine categories. The second part of this report (Chapter 3) looks at play in different venues in more detail.

For reasons of clarity, results for slot machine players (Section 3.1) are presented first followed by results for those who play machines in bookmakers (Section 3.2). Overlaps in play of these two broad 'types' of machine and how this has changed are considered in Section 3.3.

² In 1999, the questionnaire asked about play of slot/fruit machines in any venue, including bookmakers as this was prior to the introduction of the (then) called 'fixed odd betting terminals'. In 2007 and 2010, the questionnaire was updated and information about playing machines in bookmakers was collected separately to playing on slot machines in other venues. See Wardle et al., 2011 for further details.

3.1 Slot machines

Summary

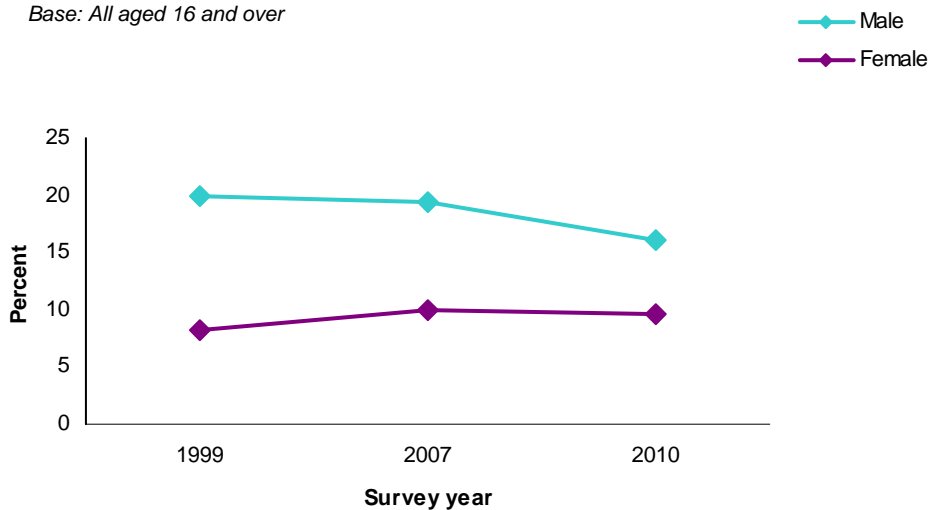
- There have been some significant changes in the profile of past year slot machine gamblers.
- Slot machine gambling remained a male dominated activity but there has been an increase in the proportion of female slot machine gamblers since 1999.
- Slot machine play remained popular among the youngest age groups. However, the overall profile aged slightly with a lesser proportion being aged 16-34 in 2010.
- A greater proportion of slot machine gamblers were in the lowest income groups compared with previous years.
- In 2010 slot machine players were more engaged in gambling than previously. They gambled on more activities than before and there is evidence that some were gambling more often on these activities.
- Slot machine players displayed greater engagement with machine gambling specifically – reporting greater frequency of playing slots and also increasing their play of machines in bookmakers.
- Mean DSM-IV scores for past year slot machine gamblers increased significantly in the past decade. This may be associated with a changing profile of slot machine players. In 2010, slot machine players were generally more engaged in gambling, both with machines and with other forms of gambling, taking part in more activities more often.
- Examination of specific DSM-IV criteria showed an increase in endorsement for some items among slot machine gamblers such as: chasing losses, preoccupation with gambling and gambling with more money to get the same excitement. These might be constructive areas to target when thinking about ways to reduce gambling-related harm in the future.
- Continued attention to the profile of slot machine players, such as the changing income profile of slot machine players, is warranted.

3.1.1 Slot machine participation in the past 12 months, by survey year

Since 1999 there has been a small but significant decrease in the prevalence of past year slot machine gambling overall. Estimates fell from 14% in 1999 to 13% in 2010. However, this masks an interesting pattern by sex. Among men past year slot machine gambling decreased from 20% in 1999 to 16% in 2010. Among women estimates increased from 8% in 1999 to 10% in 2010. The difference by sex can be seen clearly in Figure A.

Figure A: Past year prevalence of playing slots, by survey year and sex

Base: All aged 16 and over



In all survey years younger age groups were more likely than older age groups to have played slot machines in the past year. In 2010, about 1 in 4 (23%) of those aged 16 to 34 had played slot machines in the past 12 months, whereas around 1 in 8 (12%) of those aged 35 to 54 or 1 in 24 (4%) of those age 55 or over reported the same. There was no significant change in prevalence rates by age group across survey years.

(Table 1)

Table 1 Prevalence of slot machine play in the past 12 months, by age, sex and survey year*All aged 16 and over**1999, 2007, 2010*

Past year slot machine play	1999				2007				2010			
	Age group				Age group				Age group			
	16-34	35-54	55+	Total	16-34	35-54	55+	Total	16-34	35-54	55+	Total
	%	%	%	%	%	%	%	%	%	%	%	%
Male	36	17	5	20	35	18	6	19	29	15	5	16
Female	16	7	3	8	17	11	4	10	17	9	4	10
All	26	12	4	14	26	14	5	15	23	12	4	13
<i>Bases</i>												
<i>Weighted</i>	<i>2548</i>	<i>2653</i>	<i>2481</i>	<i>7700</i>	<i>2748</i>	<i>3161</i>	<i>3046</i>	<i>8972</i>	<i>2400</i>	<i>2710</i>	<i>2644</i>	<i>7754</i>
<i>Unweighted</i>	<i>2305</i>	<i>2878</i>	<i>2479</i>	<i>7680</i>	<i>2356</i>	<i>3237</i>	<i>3366</i>	<i>8978</i>	<i>2094</i>	<i>2782</i>	<i>2877</i>	<i>7753</i>

3.1.2 Participation in the past week, by survey year

Table 2 shows past week participation in slot machine gambling by survey year, age and sex. As with past year participation, overall rates of past week slot machine gambling decreased by survey year. Estimates fell from 6% in 1999 to 2% in 2010. Similar patterns were observed for men and women, though men were more likely than women to have played slot machines in the past seven days.

Table 2 Prevalence of slot machine play in the last 7 days, by age, sex and survey year*All aged 16 and over**1999, 2007, 2010*

Past week slot machine play	1999				2007				2010			
	Age group				Age group				Age group			
	16-34	35-54	55+	Total	16-34	35-54	55+	Total	16-34	35-54	55+	Total
	%	%	%	%	%	%	%	%	%	%	%	%
Male	18	6	3	9	11	4	2	6	8	3	1	4
Female	4	2	1	2	3	1	1	2	2	1	1	1
All	12	4	1	6	7	3	2	4	5	2	1	2
<i>Bases</i>												
<i>Weighted</i>	<i>2548</i>	<i>2653</i>	<i>2481</i>	<i>7700</i>	<i>2761</i>	<i>3163</i>	<i>3054</i>	<i>8996</i>	<i>2400</i>	<i>2710</i>	<i>2644</i>	<i>7754</i>
<i>Unweighted</i>	<i>2305</i>	<i>2878</i>	<i>2479</i>	<i>7680</i>	<i>2362</i>	<i>3240</i>	<i>3375</i>	<i>8996</i>	<i>2094</i>	<i>2782</i>	<i>2877</i>	<i>7753</i>

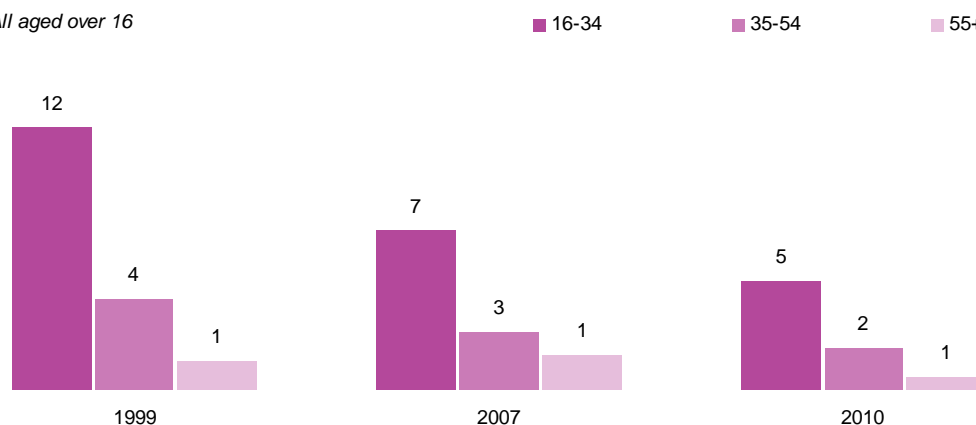
Notably there was a stronger downward trend among past week participation rates than past year participation rates. Gambling within the past seven days is often considered a proxy measure for frequency. This contrast is interesting. Among men, rates of overall participation and more frequent slot machine gambling were lower in 2010 than in previous years. Among women, overall participation rates were higher in 2010 but there is some indication that women gambled less frequently on slots than previously.

The overall decline in past week slot machine gambling was observed among all age groups (see Figure B). However, the reduction in rates was most notable among those aged 16-34, where past week play fell from 12% in 1999 to 5% in 2010. That said, in all survey years the broad pattern was that the youngest age groups were more likely to be past week slot machine gamblers. In 2010, 5% of those aged 16-34 had played slot machines in the past week compared with 1% of those aged 55 or over. This pattern is similar to that observed for past year participation. Taken together with past year participation rates, this suggests that slot machine gambling is typically undertaken most commonly and most frequently by the youngest age groups.

(Table 2, Table 1)

Figure B: Percentage of adults playing slot machines in the past week, by survey year and age

Base: All aged over 16



3.1.3 Changes in the demographic and socio-economic profile of slot machine gamblers since 1999

This section explores whether the demographic and socio-economic profile of past year slot machine gamblers has changed since 1999.

The profile of slot machine players is examined by a number of demographic, socio-economic and lifestyle characteristics including; sex, age group, marital status, ethnic group, highest educational qualification, NS-SEC of Household Reference Person (HRP)³, main economic activity of the HRP⁴, equivalised household income, whether the individual has experienced a long standing illness, general health status, smoking status and alcohol consumption.⁵ Comparisons are limited to where the same

³ NS-SEC is a classification of social position that has similarities to the Registrar General's Social Class. Respondents are assigned to an NS-SEC category based on the current or former occupation of the Household Reference Person.

⁴ The Household Reference Person is the person in the household in whose name the accommodation is owned or rented. In the case of joint ownership/rental it is the person with the highest income.

⁵ All items were entered into a regression model to test for confounding variance in the sample population.

demographic/socio-economic information was collected in each survey year. This analysis is shown in Tables 3 and 4.

Profile of slot machine gamblers by survey year

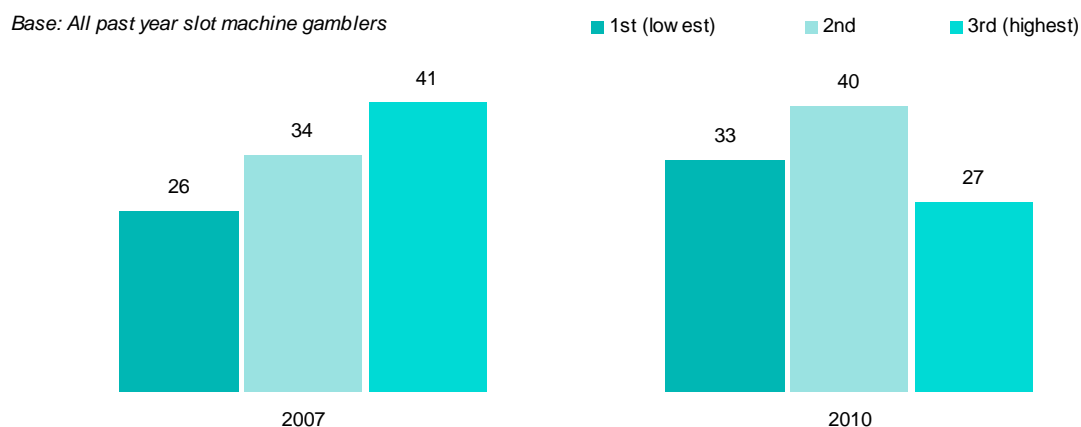
Analyses showed a significant difference in the sex and age distribution of slot machine players by survey year.

Although in all survey years, a greater proportion of slot machine players were male, by 2010 the gap between men and women narrowed. In 1999, 30% of slot machine players were women. By 2010, this had risen to 38%.

In 2010, the typical slot machine player was older than 1999. Mean age rose from 33 in 1999 to 35 in 2010 (median age estimates increased from 30 to 32). In 1999, nearly two thirds (63%) of slot machine gamblers were aged 16-34. By 2010, this had fallen to 56%. However, this may be an artefact of underlying changes in who responded to each survey year or in the population profile of Great Britain (see Appendix B).

In 2007 and 2010 participants were asked about their household income and this measure was adjusted according to the number of people living in the household. The proportion of slot machine players in the lowest income group increased from 26% in 2007 to 33% in 2010 (see Figure C).

Figure C: Percentage of slot machine players in each equivalised household income tertile, by survey year



Analyses did indicate some variation in the profile of slot machine gamblers by marital status and educational qualification across survey years. For marital status, estimates varied with no clear pattern. Looking at educational qualifications, slot machine players were more likely to have professional or degree level qualifications in 2010 than in 1999

but this is also true of all BGPS participants as a whole. As changes in the profile of slot machine gamblers fall in line with overall changes in the profile of BGPS participants, it is likely that this reflects changes within the responding population as opposed to being 'real' changes among slot machine players.

No differences were identified by ethnicity, economic activity, or NS-SEC of Household Reference Person, with the majority being White/White British or from households where the HRP was in paid employment.

(Table 3)

Table 3 Profile of slot machine gamblers, by demographic, socio-economic characteristics and survey year

Past year slot machine gamblers

1999, 2007, 2010

Demographic/socio-economic profile of slot machine players^a	1999	2007	2010
	%	%	%
Sex			
Male	70	65	62
Female	30	35	38
Age group			
16-34	63	54	56
35-54	29	34	33
55+	8	11	11
Mean age	33	36	35
Standard error of the mean	0.4	0.4	0.4
Marital status			
Married/living as married	55	47	55
Separated/Divorced	5	7	5
Single, never married	39	44	38
Widowed	1	2	2
Ethnicity			
White	b	91	90
Asian or Asian British	b	4	5
Black or Black British	b	2	3
Other ethnic group	b	3	2
Highest educational qualification			
Professional qualification or above	26	27	33
O or A levels or equivalent	53	59	52
Other	5	0	1
None	16	14	15
Main economic activity of HRP			
Paid work	82	79	78
Unemployed	4	2	3
Longterm disability	4	3	3
Looking after family/home	3	5	4
Retired	5	8	6
Full time education	2	2	3
Other	-	1	2
Equivalent household income tertile			
1st (lowest)	b	26	33
2nd	b	34	40
3rd (highest)	b	41	27

Table 3 Cont...*Past year slot machine gamblers**1999, 2007, 2010*

Demographic/socio-economic profile of slot machine players^a	1999	2007	2010
	%	%	%
NS-SEC of household reference person (HRP)			
Managerial and professional occupations	b	38	37
Intermediate occupations	b	10	10
Small employers and own account workers	b	12	13
Lower supervisory and technical occupations	b	12	14
Semi-routine occupations	b	29	26
<i>Bases^c</i>			
<i>Weighted</i>	<i>1072</i>	<i>1297</i>	<i>992</i>
<i>Unweighted</i>	<i>1007</i>	<i>1233</i>	<i>944</i>

^a The profile of slot machine players varied significantly between survey years by age, sex, marital status, educational qualifications and household income. Statistically significant differences were not observed for other characteristics.

^b 'b' indicates this question was not included in 1999.

^c Bases shown for all who gambled on slot machines in the past year, bases may vary for individual characteristics.

Table 4 shows analysis of a number of health and lifestyle factors. Among slot machine gamblers rates of alcohol consumption were broadly similar in 2007 and 2010. Furthermore, the profile of slot machine gamblers did not vary by survey year for the other health characteristics considered including general health, long standing illness and smoking status. Broad patterns were that around 2 in 5 slot machine players were current smokers, which is higher than smoking rates among the general population, around 3 in 4 had consumed alcohol in the seven days prior to interview and the majority were in good health.

(Table 4)

Table 4 Health and lifestyle characteristics of slot machine gamblers, by survey year

<i>All past year slot machine gamblers</i>	<i>2007, 2010</i>	
Health and lifestyle profile of slot machine players^a	2007	2010
	%	%
General Health		
Very good/good	81	82
Fair	16	15
Very bad/bad	3	3
Longstanding illness		
Limiting longstanding illness	9	10
Non limiting longstanding illness	8	10
No limiting illness	83	80
Smoking status		
Current cigarette smoker	38	41
Not current cigarette smoker	62	59
Alcohol consumption in last 7 days		
Did not drink in last 7 days	22	24
Drank 1-4 units on heaviest drinking day	27	30
Drank 5-9 units on heaviest drinking day	21	19
Drank 10-14 units on heaviest drinking day	14	15
Drank 15-19 units on heaviest drinking day	7	4
Drank 20 or more units on heaviest drinking day	9	9
Bases^b		
<i>Weighted</i>	<i>1297</i>	<i>992</i>
<i>Unweighted</i>	<i>1233</i>	<i>944</i>

^a The profile of slot machine players did not vary significantly between survey years by any of the health and lifestyle characteristics shown in this table.

^b Bases shown for all who gambled on slot machines in the past year, bases may vary for individual characteristics.

3.1.4 Gambling involvement among slot machine gamblers, by survey year

Past year and past week participation in other activities, by survey year

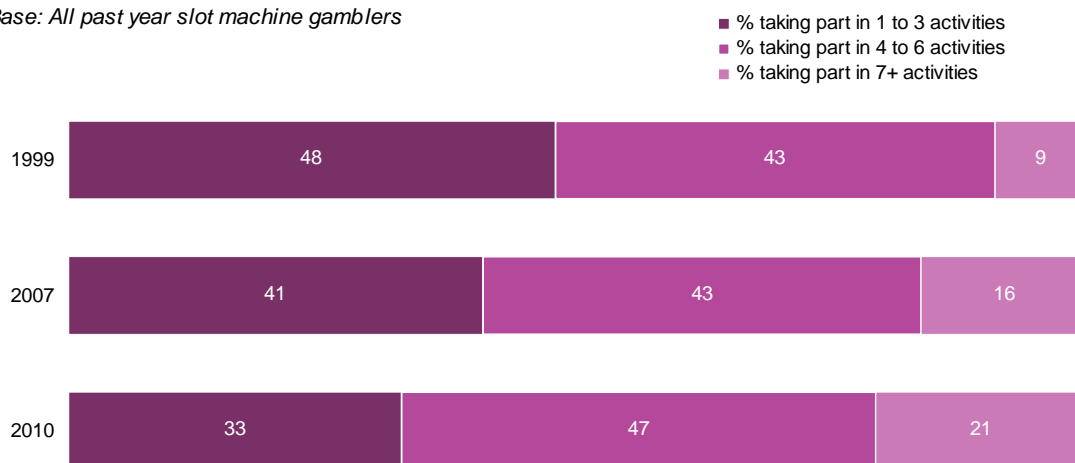
It is widely recognised that most regular gamblers do not gamble on one activity only but take part in a range of activities. This is also evident for slot machine gamblers. In each of the BGPS series, over half of all slot machine gamblers had taken part in at least four or more activities within the past year. Table 5 (and Figure D) shows the extent to which this is true for each survey year.

The number of other gambling activities which slot machine gamblers had engaged in has significantly increased since 1999. In 1999, 9% of slot machine gamblers had taken part in seven or more activities. In 2010, this had more than doubled to 21%. Examination of the mean number of activities undertaken in the past year by slot machine players also reflects this pattern, increasing from 4 in 1999 to 5 in 2010.

However, analyses showed that since 1999, the mean number of activities undertaken in the past week remained relatively flat. In both 1999 and 2010, slot machine gamblers had gambled, on average, on approximately two activities in the past week.

Figure D: Number of activities undertaken by slot machine gamblers in the past year, by survey year

Base: All past year slot machine gamblers



Frequency of gambling, by survey year

Each of the BGPS series collected information about how engaged people were with gambling. In 2007 and 2010 this included measurement of gambling frequency in the past 12 months. Data on gambling frequency in the past 12 months is summarised in Table 5 by survey year. Two measures of frequency have been calculated: frequency of gambling on any activity in the past 12 months and frequency of gambling on any machine in the past 12 months.⁶

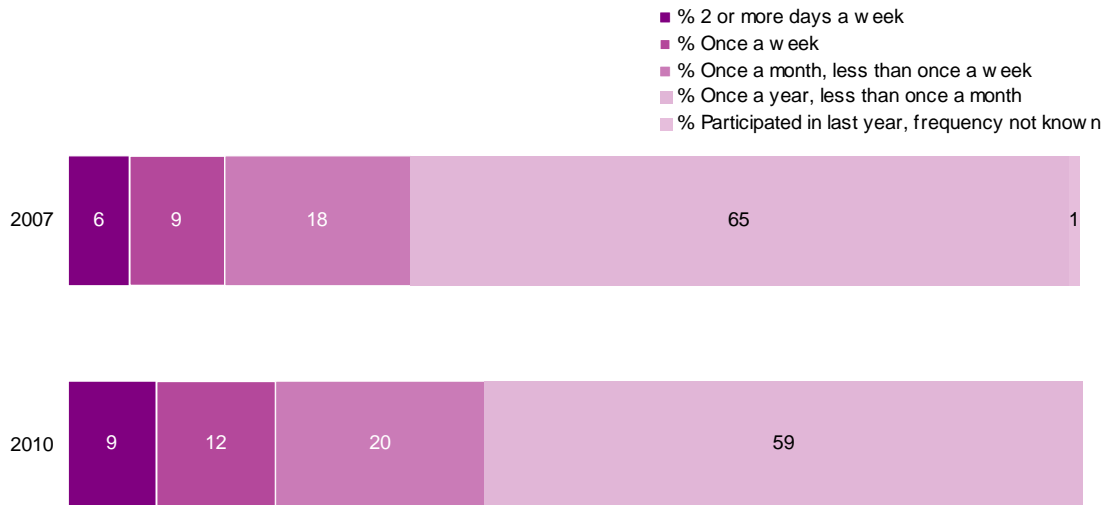
Examination of overall gambling frequency among slot machine players shows some interesting findings. Firstly, the frequency with which slot machine gamblers engaged in any form of gambling increased by survey year. In 2007, just over half (53%) of slot

⁶ Frequency of gambling on any machine was calculated by combining two measures; frequency of gambling on a slot machine within the past 12 months and frequency of gambling on any machine in a bookmaker within the past 12 months. Frequency of gambling on any machine was the most common occurrence of either.

machine players had gambled at least once a week on their most frequent activity. In 2010, nearly two thirds (63%) reported the same. Very frequent participation in any gambling activity by slot machine players followed a similar trend. In 2007, 3% of slot machine players had gambled nearly every day on their most frequent form of gambling. This doubled to 6% in 2010.

Figure E: Frequency of playing any machine in the past 12 months, by survey year

Base: All past year slot machine gamblers



The frequency with which slot machine gamblers played any machines also increased by survey year (see Figure E). In 2007, 15% of slot machine players gambled at least once a week on any machine. In 2010, this increased to 21%. Likewise, very frequent gambling on any machine followed a similar pattern. In 2007, 6% of slot machine gamblers played machines at least twice a week. This increased to 9% in 2010.

(Table 5)

Table 5 Behaviour of slot machine players, by survey year*Past year slot machine gamblers**1999, 2007, 2010*

Gambling behaviour profile of slot machine players	1999	2007	2010
	%	%	%
Number of activities undertaken in past year			
1 to 3	48	41	33
4 to 6	43	43	47
7 or more	9	16	21
Mean number of activities in past year			
Mean	3.9	4.4	4.8
Standard error of the mean	.07	.09	.09
Number of activities undertaken in past week			
1 to 3	85	87	88
4 to 6	13	11	10
7 or more	1	2	3
Mean number of activities in past week			
Mean	2.2	2.1	2.1
Standard error of the mean	.06	.05	.06
Frequency of gambling (past 12 months)			
Every day/almost every day	a	3	6
2 or more days a week	a	22	23
Once a week	a	28	33
Once a month, less than once a week	a	21	19
Once a year, less than once a month	a	26	19
Frequency of play on any machine (past 12 months)			
2 or more days a week	a	6	9
Once a week	a	9	12
Once a month, less than once a week	a	18	20
Once a year, less than once a month	a	65	59
Participated in last year, frequency not known	a	1	-
<i>Bases</i>			
<i>Weighted</i>	<i>1072</i>	<i>1297</i>	<i>992</i>
<i>Unweighted</i>	<i>1007</i>	<i>1233</i>	<i>944</i>

^a 'a' indicates this question was not included in 1999.

Types of activity participated in, by survey year

In each survey participants were asked about gambling activities they had undertaken in the past year. Activities differed according to the range of gambling activities known to exist at that time. For example, in 2007 activities reflected the increasing prominence of online gambling (both games and betting) and the introduction of machines in bookmakers. Slot machine players' participation in other gambling activities for each survey year are shown in Table 6.

Among slot machine players, changes in participation in other gambling activities display similar patterns to that observed among the population as a whole. For example, significant increases in participation were found for: buying tickets for other lotteries, buying scratchcards, playing table games in a casino, playing machines in bookmakers and betting on sports or other events with a bookmaker. Activities which were less popular among slot machine players in 2010 were: buying tickets for the National Lottery draw, playing football pools and betting on the horses with a bookmaker.

(Table 6)

Table 6 Participation in gambling activities among slot machine players, by survey year

<i>Past year slot machine gamblers</i>	<i>1999, 2007, 2010</i>		
Participation in other activities by slot machine players	1999	2007	2010
	%	%	%
National Lottery Draw	86	79	79
Other lotteries	15	20	37
Scratchcards	54	49	57
Bingo	16	18	17
Football pools	14	7	12
Machines in bookmakers	a	13	18
Table games in a casino	11	16	16
Online fruit/slots/instant wins	a	11	22
Online with a bookmaker	a	12	9
Horse races (with a bookmaker, not online)	33	40	32
Dog races (with a bookmaker, not online)	13	16	13
Sports or other events (with a bookmaker, not online)	10	20	27
Spread betting	a	3	3
Betting exchanges	a	4	2
Private betting	36	34	36
<i>Bases^b</i>			
<i>Weighted</i>	<i>1072</i>	<i>1297</i>	<i>992</i>
<i>Unweighted</i>	<i>1007</i>	<i>1233</i>	<i>944</i>

^a 'a' indicates that this activity was not included in 1999.

^b Bases shown for all who gambled on slot machines in the past year, bases may vary for individual activities.

3.1.5 Change in problem gambling rates among slot machine gamblers by survey year

The main BGPS 2010 report showed problem gambling rates (as measured by the American Psychological Association's Diagnostic Statistics Manual IV of common mental disorders) among all past year slot machine gamblers (cf. Table 6.4 in the BGPS 2010 report). However, this did not examine how endorsement of specific items or mean DSM-IV scores may have changed among slot machine players. This analysis is shown in Table 7.

Firstly, the proportion of slot machine players who were problem gamblers has not significantly increased since 1999. Estimates were 3% in 1999 and 4% in 2010.⁷ However, there was a significant increase in the mean DSM-IV scores among slot machine gamblers by survey year. Mean DSM-IV scores were 0.21 in 1999 increasing to 0.34 in 2010. This highlights how those who gamble on slot machines experienced slightly more difficulties with their gambling since 1999. This is in keeping with earlier findings as difficulties with gambling (as indicated by mean DSM-IV scores) are commonly associated with increased engagement with gambling.

Examination of specific DSM-IV item responses also shows some interesting findings. Since 1999 there was a significant increase in the endorsement of specific items by slot machine gamblers. These were: chasing losses, preoccupation with gambling and gambling with more money to get the same excitement. In 1999, 5% of all past year slot machine players reported experiencing a preoccupation with gambling. In 2010, this had increased to 8%. Likewise the proportion of past year slot machine gamblers chasing losses increased from 4% in 1999 to 6% in 2010. Finally the proportion of past year slot machine gamblers reporting that they gambled with more money to get the same excitement doubled from 2% in 1999 to 4% in 2010.

(Table 7)

⁷ This lack of significance may be an artefact of the small base sizes, as the BGPS series was not designed to identify changes in problem gambling rates among sub-groups.

Table 7 Problem gambling scores (DSM-IV) and item endorsement of slot machine players, by survey year

All past year slot machine gamblers aged 16 and over

1999, 2007, 2010

Problem gambling score and item responses among slot machine players	1999	2007	2010
	%	%	%
Problem gambling status (DSM-IV)			
Non-problem gambler	97	97	96
Problem gambler	3	3	4
Mean DSM-IV score (out of 10)			
Mean	0.21	0.25	0.34
Standard error of the mean	0.03	0.03	0.03
Endorsement of DSM-IV items ^a			
Chasing losses	4	7	6
A preoccupation with gambling	5	5	8
A need to gamble with increasing amounts of money	2	2	4
Being restless or irritable when trying to stop gambling	2	2	3
Gambled as escapism	2	2	3
Lying to people to conceal extent of gambling	1	2	2
Having tried but failed to cut back on gambling	2	2	2
Having committed a crime to finance gambling ^b	1	1	1
Having risked or lost a relationship/job/educational opportunity because of gambling ^b	1	1	2
Reliance on others to help a financial crisis caused by gambling ^b	2	2	3
<i>Bases^c</i>			
<i>Weighted</i>	<i>1057</i>	<i>1193</i>	<i>992</i>
<i>Unweighted</i>	<i>993</i>	<i>1139</i>	<i>944</i>

^a Unless otherwise specified, endorsement means the participant reported that they always or often engaged in this behaviour.

^b Endorsement means that the participant reported that they occasionally, fairly often, very often engaged in this behaviour.

^c Bases shown are for all who gambled on slot machines in the past year, bases may vary for individual items.

3.1.6 Slot machines: discussion

This section aimed to explore the profile and behaviour of slot machine players in more depth using data from the British Gambling Prevalence Survey series. It examined who gambles on slot machines, what else they gamble on, experience of gambling-related harm and how each has changed over time.

This chapter lends some insight into the changing profile of slot machine gamblers since 1999. Slot machine gambling has remained a male dominated activity. However, a growing proportion of women slot machine gamblers were identified. This may be related to the general upturn in female gambling rates observed since 1999 or could be related to efforts to increase female interest in slots (such as promoting slots at bingo halls). However, there was a notable decline in participation among men and among those aged 16-34. This may be related to the removal of slots from convenience

locations, such as taxi offices, fast food shops, and the rise of the gastro-pub phenomena meaning there may be fewer 'opportunistic' players in 2010 than in 1999. Credence is given to this theory by the increase in regular play observed among slot machine players in 2010, whereby those who do play, play more often. It suggests that the profile of slot machine players may have altered since 2007 and without more 'opportunistic' players in the sample, the profile becomes more skewed towards those for whom slot machine gambling is a more regular past time. However, this is just one possible explanation, and whilst plausible, needs further examination and corroborating evidence.

The increase in proportion of past year slot machine gamblers among the lowest income group is of note as it represents an increase in participation among a (potentially) 'at-risk' group. Furthermore, although levels of problem gambling remained relatively flat across survey years, an increase in mean DSM-IV scores suggests an upturn in gambling-related difficulties. Since 1999, chasing losses, a preoccupation with gambling and gambling with more money to get the same excitement all received increased endorsement by slot machine gamblers.

Several factors were identified which may underpin the slightly raised mean DSM-IV scores and endorsement for specific DSM-IV item responses by survey year. For example, since 1999 the number of other gambling activities undertaken by slot machine players has increased significantly. Analyses also revealed an increase in frequency of gambling on any activity and frequency of gambling on any machine among slot machine players. This means that slot machine players in 2010 were more engaged in gambling generally and machine gambling specifically than previously. All of which may be related to the different profile of slot machine players noted above.

That said, both frequency of participation and number of gambling activities undertaken are commonly related to problem gambling. Therefore these trends should be monitored and considered when developing future responsible gambling strategies and approaches.

3.2 Machines in bookmakers

Summary

- Since 2007, the proportion of people playing machines in bookmakers in the past year has increased from 3% to 4%. The largest increases were observed among men aged 16-34 where past year prevalence rates increased from 9% to 14%.
- In 2010, compared with 2007, bookmaker machine players were less likely to be in the highest income groups, though this was likely to be a function of their somewhat younger age.
- There was a small increase in the proportion of people who played machines in bookmakers from households where the Household Reference Person was unemployed or in full-time education.
- Since 2007, there have been few changes in how often bookmaker machine players either gamble on other activities or gamble on machines. However, a high proportion of bookmaker machine players were very regular gamblers, gambling on their most frequent activity at least once a week.
- A smaller but notable proportion of bookmaker machine gamblers were very regular machine players, gambling on any machine at least once a week within the past year. This, along with the average number of other gambling activities undertaken in by this group, suggests that this group are, typically, very engaged in gambling. This suggests that further attention be given to understanding the profile and behaviours of this group.
- The changing profile of those who play machines in bookmakers has some (potentially) important implications for responsible gambling strategies. Typically, those who are younger, receive lower incomes or who are unemployed are more vulnerable to gambling-related harm. This reflects the changing profile of this group. That said, data showed there were some notable reductions in endorsement of certain types of gambling problems. It will be important to monitor this changing profile and to assess *if* this translates into increased risk of harm in the future. Therefore the profile of those who play machines in bookmakers should continue to be monitored.

The sections that follow examine changes in participation in machine gambling at bookmakers. Data relating to this activity was only included in the 2007 and 2010 surveys. Therefore comparisons are restricted to these years. As with slot machine players, we examine the profile of this group, their levels of gambling engagement, experience of gambling-related harm and how each has changed since 2007.

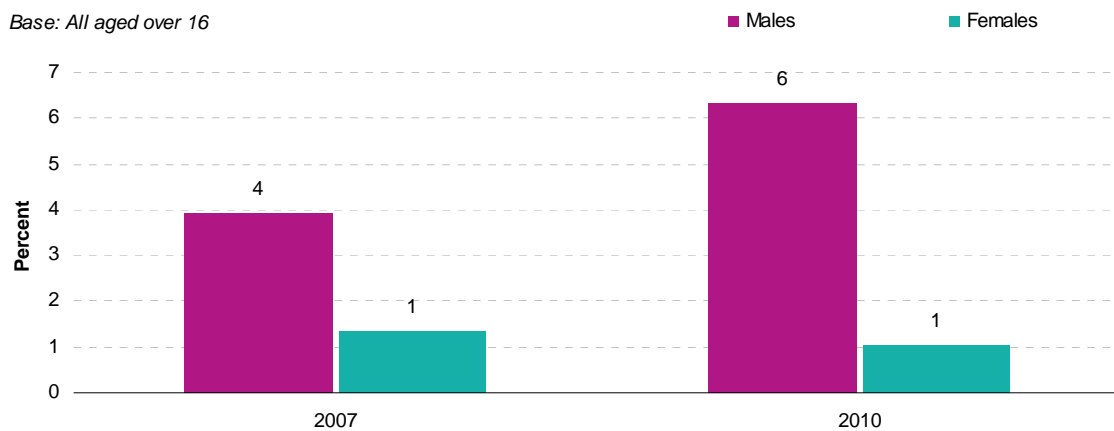
3.2.1 Participation in the past 12 months, by survey year

As with slot machines, participation rates for gambling on machines in bookmakers were examined across the BGPS series for two time periods: participation in the past 12 months and participation in the past seven days.

Since 2007, there has been a significant increase in the prevalence of past year gambling on machines in bookmakers overall. Estimates rose from 3% in 2007 to 4% in 2010.

Past year prevalence by survey year varied by sex. Among men, past year rates of gambling on machines in bookmakers increased from 4% in 2007 to 6% in 2010. Among women estimates remained at 1% in 2007 and 2010 respectively. This is shown in Figure F. This shows that the increase in participation is attributable solely to men.

Figure F: Past year prevalence of gambling on machines in bookmakers, by survey year and sex



Among men, increases in participation were generally observed among all age groups, but the sharpest increase was among those aged 16-34. Past year prevalence rates rose from 9% in 2007 to 14% in 2010. Among women, there were no differences in past year participation rates by age group.

Despite these changes among younger men, the pattern of participation by age remained the same. In both survey years, younger age groups were much more likely than older age groups to have gambled on machines in bookmakers in the past year. In 2010, 9% of those aged 16-34 had played machines in bookmakers in the past 12 months. The equivalent estimate among those aged 35-54 was 2%, whilst less than 1% of those aged over 55 reported the same.

(Table 8)

Table 8 Prevalence of playing machines in bookmakers in the past 12 months, by age, sex and survey year

<i>All aged 16 and over</i>					<i>2007, 2010</i>			
Past year play of machines in bookmakers	2007				2010			
	Age group				Age group			
	16-34	35-54	55+	Total	16-34	35-54	55+	Total
	%	%	%	%	%	%	%	%
Male	9	3	1	4	14	4	1	6
Female	3	1	0	1	3	1	0	1
All	6	2	1	3	9	2	0	4
<i>Bases</i>								
<i>Weighted</i>	<i>2748</i>	<i>3161</i>	<i>3046</i>	<i>8972</i>	<i>2400</i>	<i>2710</i>	<i>2644</i>	<i>7754</i>
<i>Unweighted</i>	<i>2356</i>	<i>3237</i>	<i>3366</i>	<i>8978</i>	<i>2094</i>	<i>2782</i>	<i>2877</i>	<i>7753</i>

3.2.2 Participation in the past week, by survey year

Table 9 shows rates of gambling on machines in bookmakers in the past seven days by age and sex.

Since 2007, there has been no significant change in the prevalence of past week gambling on machines in bookmakers by survey year. Prevalence estimates were 1% in 2007 and 1% in 2010. Gambling within the past seven days is often considered a proxy measure for frequency. Therefore, frequency of gambling on machines in bookmakers has remained stable. This pattern was the same for men and women.

Finally, since 2007 there was no change in past week gambling prevalence on bookmakers' machines by age group. In both 2007 and 2010 past week play was more prevalent among the youngest age groups. For example, in 2010, 1% of those aged 16-34 had played on machines in bookmakers in the past seven days. Equivalent estimates for those aged 55 or over were less than 1%.

(Table 9)

Table 9 Prevalence of playing machines in bookmakers in the last 7 days, by age, sex and survey year

All aged 16 and over

2007, 2010

Past week play of machines in bookmakers	2007				2010			
	Age group				Age group			
	16-34	35-54	55+	Total	16-34	35-54	55+	Total
	%	%	%	%	%	%	%	%
Male	3	1	1	2	3	1	0	1
Female	1	0	0	0	0	0	-	0
All	2	1	0	1	1	1	0	1
<i>Bases</i>								
<i>Weighted</i>	<i>2761</i>	<i>3163</i>	<i>3054</i>	<i>8996</i>	<i>2400</i>	<i>2710</i>	<i>2644</i>	<i>7754</i>
<i>Unweighted</i>	<i>2362</i>	<i>3240</i>	<i>3375</i>	<i>8996</i>	<i>2094</i>	<i>2782</i>	<i>2877</i>	<i>7753</i>

3.2.3 Changes in the demographic and socio-economic profile of bookmaker machine gamblers, since 2007

This section examines whether the demographic and socio-economic profile of those who have gambled on machines on bookmakers has changed since 2007.

The profile of bookmaker machine players was examined by a number of demographic, socio-economic and lifestyle characteristics including: sex, age group, marital status, ethnic group, highest educational qualification, NS-SEC of HRP, main economic activity of the HRP, equivalised household income, whether the individual has experienced a long standing illness, general health status, smoking status and alcohol consumption. This analysis is shown in Tables 10 and 11.

Profile of people who gamble on machines in bookmakers, by survey year

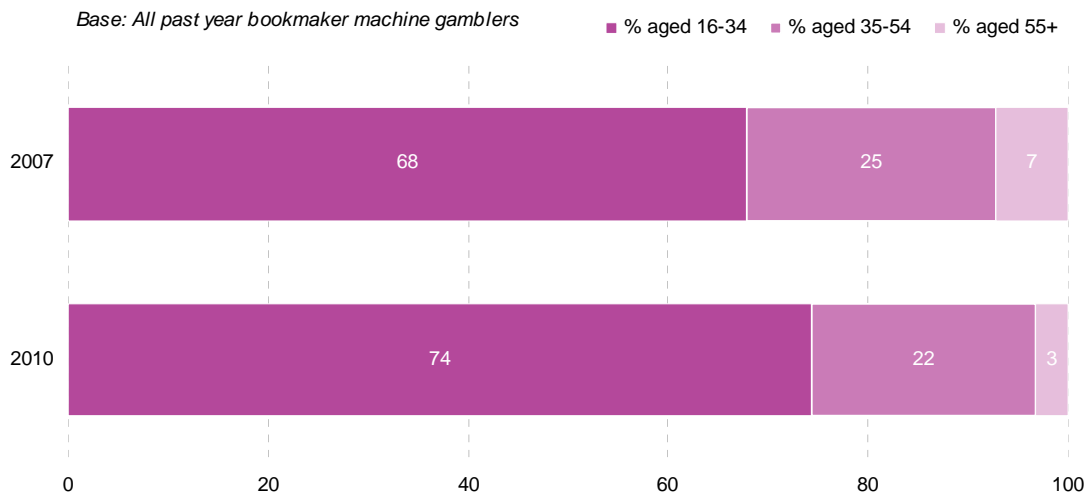
The sex and age distribution of people who played on machines in bookmakers varied significantly by survey year.

In both 2007 and 2010 the profile of people who played on machines in bookmakers was predominantly male. However, in 2010 the gap between men and women had widened. In 2007, 73% of people who played machines in bookmakers were men (meaning that around 1 in 4 were women). By 2010 this had increased to 85% (meaning that only around 1 in 7 were women).

The typical person who gambled on machines in bookmakers was slightly younger in 2010 than in 2007. In 2007, 67% were aged 16-34, in 2010 this increased to 74% (see

Figure G). The mean age of bookmaker machine players also fell from 32 in 2007 to 30 in 2010, though this was at the margins of statistical significance (median age was 27 in 2007 and 26 in 2010).

Figure G: Age group profile of people who gamble on machines in bookmakers, by survey year



The economic activity of household reference person (HRP) among bookmaker machine players was examined by survey year. Since 2007, there was an increase in the proportion of players who lived in households where the HRP was unemployed or in full-time education. However, this could be associated with the changing age profile of bookmaker machine players and consequently who they live with. Results were checked in a logistic regression model and economic activity remained significant once age was taken into account. The same was true of educational attainment, with the proportion of bookmaker machine players educated to professional or degree level qualifications increasing.

Participants were asked about their household income and this measure was adjusted according to the number of people living in the household. Among people who gambled on machines in bookmakers, the proportion of people in the highest income group decreased by survey year. In 2007, 39% were among the highest income group, equivalent estimates in 2010 were 27%. However, once age was taken into account, this was no longer significant. No differences were identified in ethnicity or NS-SEC of Household Reference Person (similar to social class).

(Table 10)

Table 10 Profile of bookmakers' machine players, by demographic, socio-economic characteristic and survey year

All past year bookmakers' machine players

2007, 2010

Demographic/socio-economic characteristics of bookmakers' machine players^a	2007	2010
	%	%
Sex		
Male	73	85
Female	27	15
Age group		
16-34	68	74
35-54	25	22
55+	7	3
Mean age	32	30
Standard error of the mean	0.70	0.56
Marital status		
Married/living as married	33	39
Separated/divorced	8	4
Single, never married	57	56
Widowed	2	-
Ethnic group		
White	91	91
Asian or Asian British	4	2
Black or Black British	3	3
Other ethnic group	2	4
Highest educational qualification		
Professional qualification or above	20	29
GCSEs, O or A levels	61	56
Other	0	0
None	19	14
Main economic activity of HRP		
Paid work	74	71
Unemployed	2	6
Long-term disability	5	3
Looking after family/home	6	3
Retired	6	1
Full-time education	6	14
Other	2	2
Equivalent household income tertile		
1 st (lowest)	35	40
2 nd	27	33
3 rd (highest)	39	27

Table 10 Cont...*All past year bookmakers' machine players**2007, 2010*

Demographic/socio-economic characteristics of bookmakers' machine players^a	2007	2010
	%	%
NS-SEC of household reference person (HRP)		
Managerial and professional occupations	28	34
Intermediate occupations	9	8
Small employers and own account workers	16	12
Lower supervisory and technical occupations	12	13
Semi-routine occupations	35	34
<i>Bases^b</i>		
<i>Weighted</i>	<i>233</i>	<i>281</i>
<i>Unweighted</i>	<i>202</i>	<i>243</i>

^a The profile of bookmakers' machine players varied significantly between survey years by age, sex, economic activity of the HRP, educational qualifications and household income. Statistically significant differences were not observed for other characteristics.

^b Bases shown for all who gambled on bookmakers' machines in the past year, bases may vary for individual characteristics.

The profile of people who had gambled on machines in bookmakers did not change by survey year for other health variants/indicators including general health, long standing illness, smoking status or alcohol consumption. Like slot machines players, people who played machines in bookmakers were more likely to be current smokers and drinkers and be in good health.

(Table 11)

Table 11 Health and lifestyle characteristics of bookmakers' machine players, by survey year

<i>All past year bookmakers' machine players</i>	<i>2007, 2010</i>	
Health and lifestyle characteristics of bookmakers' machine players^a	2007	2010
	%	%
General Health		
Very good/good	80	84
Fair	15	12
Very bad/bad	5	4
Longstanding illness		
Limiting longstanding illness	10	11
Non limiting longstanding illness	8	6
No limiting illness	82	83
Smoking status		
Current cigarette smoker	44	48
Not current cigarette smoker	56	52
Alcohol consumption in last 7 days		
Did not drink in last 7 days	21	22
Drank 1-4 units on heaviest drinking day	23	19
Drank 5-9 units on heaviest drinking day	16	22
Drank 10-14 units on heaviest drinking day	13	13
Drank 15-19 units on heaviest drinking day	8	7
Drank 20 or more units on heaviest drinking day	19	18
Bases^b		
<i>Weighted</i>	<i>233</i>	<i>281</i>
<i>Unweighted</i>	<i>202</i>	<i>243</i>

^a The profile of bookmakers' machine players did not vary significantly between survey years by any of the health and lifestyle characteristics shown in this table.

^b Bases shown for all who gambled on machines in bookmakers in the past year, bases may vary for individual characteristics.

3.2.4 Gambling involvement among people who gamble on machines in bookmakers, by survey year

Past year and past week participation in other activities, by survey year

This section presents information about gambling involvement among people who have gambled on machines in bookmakers in the past year. Participation is measured by the number of other gambling activities undertaken and the type of activities engaged in. Data is presented in Table 12.

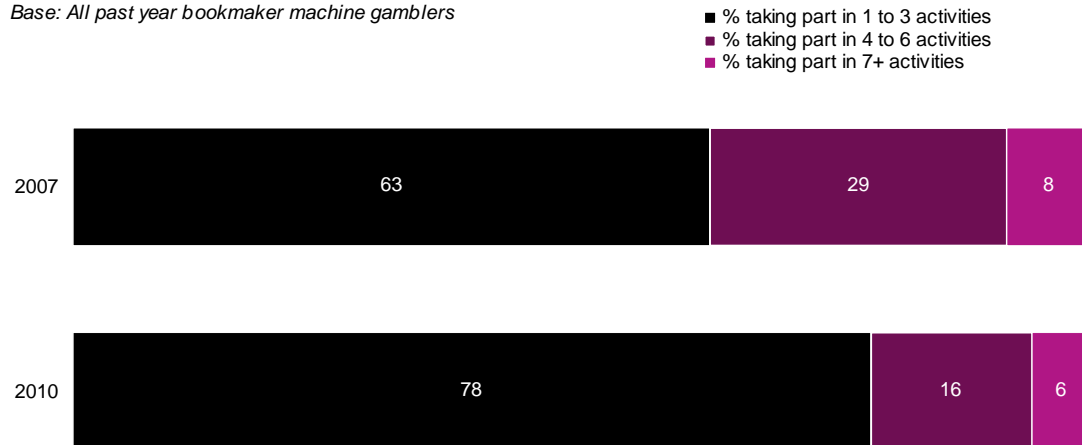
Since 2007, there was no significant change in the number of activities undertaken by bookmaker machine gamblers in the past year. In 2010, the vast majority of bookmaker machine players had taken part in at least four or more gambling activities in the past year (91%). Estimates in 2007 were similar (88%). This suggests that people who gamble on machines in bookmakers were very engaged in gambling generally and remained so across survey years.

Bookmaker machine gamblers took part in significantly fewer activities in the past week in 2010 than in 2007. In 2007, 38% had undertaken four or more activities in the past week. In 2010, 22% reported the same. Conversely the proportion of those engaging in one to three activities increased from 63% in 2007 to 78% in 2010. Mean number of activities undertaken in the past week similarly reflected a downward trend, decreasing from 3.3 in 2007 to 2.6 in 2010. This is shown in Figure H.

(Table 12)

Figure H: Number of activities undertaken by bookmaker machine gamblers in the past week, by survey year

Base: All past year bookmaker machine gamblers



Frequency of gambling, by survey year

Gambling volume (i.e., how much of an activity someone does) can be measured in a variety of ways, one of these being how often a person takes part in an activity. Within the BGPS 2007 and 2010 two measures of gambling frequency were computed: frequency of gambling on any activity in the past 12 months and frequency of gambling on any machine⁸ in the past 12 months.

Firstly, no significant differences were found by survey year in the frequency which bookmakers machine gamblers engaged in any form of gambling activity, or gambled on any machine (see Figure I). In 2007, 68% of bookmaker machine players had gambled on their most frequent activity at least once a week. Equivalent estimates in 2010 were 73%. Therefore in 2010, approximately three quarters of past year bookmaker machine gamblers could be considered very regular gamblers.

(Table 12)

⁸ Frequency of gambling on any machine was calculated by combining two measures; frequency of gambling on a slot machine within the past 12 months and frequency of gambling on any machine in a bookmaker within the past 12 months. Frequency of gambling on any machine was the most common occurrence of either.

Figure I: Bookmaker machine gamblers: frequency of gambling on most frequent activity by survey year

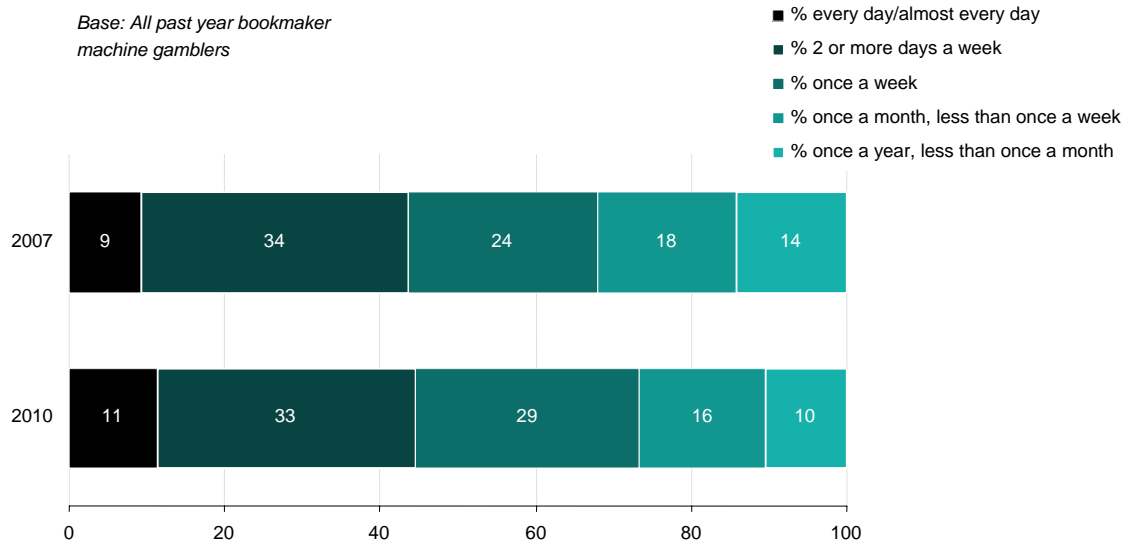


Table 12 Behaviour of bookmakers machine players, by survey year

<i>Past year bookmakers' machines gamblers</i>	<i>2007, 2010</i>	
Gambling behaviour profile of bookmakers' machine players	2007	2010
	%	%
Number of activities undertaken in past year		
1 to 3	12	9
4 to 6	35	40
7 or more	54	51
Mean number of activities in past year		
Mean	7.0	6.8
Standard error of the mean	0.14	0.11
Number of activities undertaken in past week		
1 to 3	63	78
4 to 6	29	16
7 or more	8	6
Mean number of activities in past week		
Mean	3.3	2.6
Standard error of the mean	0.1	0.1
Frequency of gambling (past 12 months)		
Every day/almost every day	9	11
2 or more days a week	34	33
Once a week	24	29
Once a month, less than once a week	18	16
Once a year, less than once a month	14	11
Frequency of play on any machine (past 12 months)		
2 or more days a week	19	19
Once a week	16	19
Once a month, less than once a week	28	25
Once a year, less than once a month	35	36
Participated in last year, frequency not known	2	0
<i>Bases^a</i>		
<i>Weighted</i>	<i>233</i>	<i>281</i>
<i>Unweighted</i>	<i>202</i>	<i>243</i>

^a Bases shown are for all who gambled on bookmakers' machines in the past year, bases may vary for individual gambling behaviours may vary.

Types of activity participated in, by survey year

The BGPS measured participation in all gambling activities in the past year. Participation in each gambling activity among bookmaker machines players in each survey year is presented in Table 13.

Significant increases in past year participation among bookmaker machine gamblers were found for: playing football pools, playing online games such as fruit or slot machines or instant wins and betting on sports or other events with a bookmaker. With the exception of football pools, these were similar to patterns of gambling behaviour

observed among all gamblers, with online gambling and betting on other events and sport becoming more popular.

Table 13 Participation in gambling activities among bookmakers machine players, by survey year

<i>Past year bookmakers' machines gamblers</i>	<i>2007, 2010</i>	
Participation in other activities by bookmakers' machine players	2007	2010
	%	%
National Lottery Draw	76	78
Other lotteries	28	33
Scratchcards	54	61
Bingo	25	15
Football pools	17	23
Machines in bookmakers	74	62
Table games in a casino	38	41
Online fruit/slots/instant wins	34	43
Online with a bookmaker	31	19
Horse races (with a bookmaker, not online)	58	46
Dog races (with a bookmaker, not online)	40	27
Sports or other events (with a bookmaker, not online)	42	57
Spread betting	12	11
Betting exchanges	11	8
Private betting	53	51
<i>Bases</i>		
<i>Weighted</i>	<i>233</i>	<i>281</i>
<i>Unweighted</i>	<i>202</i>	<i>243</i>

Activities identified as being less popular among people who gambled on machines in bookmakers in 2010 were: playing bingo, gambling on slot machines, betting online with a bookmaker, betting on horse races with a bookmaker and betting on the dog races with a bookmaker.

Of interest is the significant decrease in betting on horse races with a bookmaker and betting on dog races with a bookmaker among those playing machines in bookmakers. Trends for each of these are contrary to those observed among the general population as reported in the BGPS 2010 (page 27). That said, in 2007, 42% of bookmaker machine gamblers reported betting on sports or other events with a bookmaker. This increased to 57% in 2010, indicating a great deal of correspondence between these activities.

In 2007, 35% of bookmaker machine players had gambled on any machine at least once a week. In 2010, 38% reported the same. This suggests that there is a subset of bookmaker machine gamblers who are heavily engaged in machine gambling specifically.

(Table 13)

3.2.5 Change in problem gambling rates among bookmaker machine gamblers by survey year

As detailed in Section 3.1.5, problem gambling rates were calculated according to the DSM-IV criteria and were assessed using 10 items (Table 14). Associations between bookmaker machine gambling, problem gambling and any key differences by survey year are discussed below.

Firstly, the proportion of bookmaker machine gamblers who were problem gamblers had not changed significantly since 2007. Estimates were 11% in 2007 and 9% in 2010. Mean DSM-IV scores also remained static by survey year. In 2010, mean DSM-IV scores among bookmaker machine players were 0.7.

Among bookmaker machine gamblers examination of specific DSM-IV item responses shows a significant decrease in endorsement for some criteria by survey year. These were: chasing losses and lying to friends and family to conceal the extent of gambling. In 2007, 17% of all past year bookmaker machine players reported chasing losses. Approximately half this proportion (9%) reported the same in 2010. Similarly, the proportion of past year bookmaker machine gamblers who had lied to friends or family to hide the extent of their gambling decreased from 10% in 2007 to 4% in 2010.

In summary, rates of problem gambling or mean DSM-IV scores did not change significantly by survey year. However, examination of specific DSM-IV criteria revealed there has been a change in endorsement for some items among bookmaker machine gamblers. Changes indicate a promising downward trend in the proportion of bookmaker machine gamblers reporting chasing losses or lying to hide the extent of their gambling. That said, some caution should be made when interpreting these results as base sizes are small and only c.250 bookmaker machine players were interviewed in each survey year.

(Table 14)

Table 14 Problem gambling scores (DSM-IV) and item endorsement of bookmakers' machine players, by survey year

<i>All past year bookmakers' machine gamblers</i>	<i>2007, 2010</i>	
Problem gambling score and items responses among bookmakers' machine players	2007	2010
	%	%
Problem gambling status (DSM-VI)		
Non-problem gambler	89	91
Problem gambler	11	9
Mean DSM-IV score (out of 10)		
Mean	0.9	0.7
Standard error of the mean	0.1	0.1
Endorsement of DSMI-V items ^a		
Chasing losses	17	10
A preoccupation with gambling	18	17
A need to gamble with increasing amounts of money	8	8
Being restless or irritable when trying to stop gambling	7	7
Gambled as escapism	9	6
Lying to people to conceal extent of gambling	10	5
Having tried but failed to cut back on gambling	7	4
Having committed a crime to finance gambling ^b	2	1
Having risked or lost a relationship/job/educational opportunity because of gambling ^b	5	3
Reliance on others to help a financial crisis caused by gambling ^b	7	8
<i>Bases^c</i>		
<i>Weighted</i>	<i>213</i>	<i>281</i>
<i>Unweighted</i>	<i>186</i>	<i>243</i>

^a Unless otherwise specified, endorsement means the participant reported that they always or often engaged in this behaviour.

^b Endorsement means that the participant reported that they occasionally, fairly often, very often engaged in this behaviour.

^c Bases shown are for all who played machines in bookmakers in the past year, bases may vary for individual items.

3.2.6 Machines in bookmakers: discussion

This section aimed to explore the profile and patterns of behaviour among bookmaker machine players in more depth using the British Gambling Prevalence Survey series. It examined who gambles on machines in bookmakers, what else they gamble on, patterns of gambling-related harm and how each has changed over time. This chapter presents important insight into current rates of participation, the profile of bookmaker machine gamblers and how each has evolved since 2007.

Firstly, we saw some notable increases in prevalence among young males, with around 1 in 7 men aged 16-34 having played these machines in bookmakers in the past year. However, no variation was found by survey year for women. It would be interesting to see how this pattern evolves and whether these machines continue to be a male dominated activity.

The changing age profile of people who had played these machines in bookmakers was also of interest. Since 2007, the age profile of bookmaker machine gamblers became younger. Given that younger age groups have higher rates of gambling-related harm, this pattern should continue to be monitored.

Other significant changes were that greater proportions were in middle or lower income groups, though this was related to age. This suggests a somewhat changing profile of those who play machines in bookmakers with the broad pattern showing greater proportions of players coming from groups that may be considered to have increased risk of gambling-related harm.

That said, data did not show any changes in problem gambling rates among people who gamble on machines in bookmakers and there were some notable reductions in endorsement of certain types of gambling problems. However, it will be important to monitor this changing profile and to assess *if* this translates into increased risk of harm in the future. It is also important to note that, typically, bookmaker machine players were very engaged with both gambling generally and there was a subset that were very engaged in machine play. This profile had neither increased or decreased since 2007 and bookmaker machine players continued to display high levels of gambling involvement.

3.3 Overlap in machine play

The analysis presented in Sections 3.1 and 3.2 allowed us, for the first time, to make important distinctions between slot machine gamblers and people who gamble on machines in bookmakers.

As would be expected, given that slot machines are more widely available across a range of venues, the prevalence of slot machine gambling was greater than the prevalence of playing machines in bookmakers. In 2010 estimates were 13% and 4% respectively.

However, changes in participation rates for both forms of machine gambling were interesting. Prevalence estimates for slot machine gambling have decreased whilst prevalence estimates for gambling on machines in bookmakers have increased. A key question, therefore, is what (if any) levels of substitution or addition are evident between these forms of machine play. This data can not answer these questions definitively but can shed some light on them. For example, in 2007, 13% of slot machine players had also played machines in bookmakers. In 2010, this had increased to 18%, meaning that in 2010 an increasing proportion of slot machine players were also trying machines in bookmakers. Conversely, the proportion of bookmaker machine players also playing slots decreased from 74% in 2007 to 62% in 2010.

The different patterns over time by age and sex in slot machine and bookmakers' machines play are also of note. Among men, prevalence of slot machine play decreased whilst prevalence of playing machines in bookmakers increased. This converse pattern was specifically observed among younger men. The steepest rates of decrease in slot machine play were observed among those aged 16-34 whilst the greatest rates of increase in bookmakers' machines play were also evident among this age group. From this data, we cannot draw conclusions that some young men are swapping slots in other venues for machines in bookmakers but it would be of interest to monitor how these patterns progress and, where possible, to understand more about how, why and under what circumstances different groups of people choose to play different types of machines.

4 Profile of machine players in 2010

This section explores the profile of machine players in greater depth using the BGPS 2010 data only. In 2010, new questions were asked of machine players about their venue of play. This allowed us to examine how different groups of machine players, based on venue preference, may vary from one another and to explore their profile. In this chapter we first describe our findings which identified different groups of machine players. We then examine whether these different ‘types’ of machine player varied by demographic, socio-economic, lifestyle and gambling characteristics.

4.1 Types of machine players

4.1.1 Definition of machine players

In this chapter machine players are defined as anyone who had played a slot or fruit machine for money in the past year or who had played a machine in bookmakers in the past year. In total, 1,047 machine players were interviewed in BGPS 2010. The prevalence of playing any type of gambling machine in the past year was 14%. There was some overlap between those playing slots machine and those playing machines in a bookmaker with 18% of slot machine players also playing machines in bookmakers, see Section 3.3.

4.1.2 Typologies of machine players

We constructed a typology of machine players based on their reported venue of play in the past year. The aim was to examine what types of machine player might exist by examining preferences for play in different venues. Examining venue of play also works as a crude proxy for machine type (i.e., those who played machines in a bookmakers are playing a certain category of machine).

Machine players were asked to report all the places they had played machines in the past year. Available answer options were:

- Pub or bar
- Amusement arcade
- Bingo club
- Bookmakers⁹
- Sports or social club
- Casino
- Motorway service station
- Somewhere else.

⁹ Those who had only played machines in a bookmakers were included in this category in the analysis that follows.

Using this information, machine gamblers were classified into five mutually exclusive groups, using Latent Class Analysis (LCA). LCA is a statistical approach used to categorise individuals into different classes based on their responses to a series of questions. After examining several different models, it was agreed by the research team that a five class model best fit the data (a detailed explanation of this methodology can be found in Appendix A).

The five class solution offered the best statistical ‘fit’ of the data whilst providing a solution that made substantive sense and was easily interpretable. The resulting classes were also relatively homogenous. The factors determining membership of each group are shown in the table below, followed by information about the size of each class (Table B).

Table A LCA classification of machine player classes by venue of play					
<i>Base: 1047</i>	LCA classes:				
Where played machines:	Class 1	Class 2	Class 3	Class 4	Class 5
	%	%	%	%	%
In a pub	100	0	0	0	100
In an amusement arcade	10	100	9	1	76
In an bingo hall	1	0	0	17	17
In a bookmaker	19	0	100	0	71
In a sports or social club	3	0	1	27	41
In a casino	1	1	7	34	30
In a motorway service station	1	0	0	5	25
Somewhere else	1	0	0	0	0

4.1.3 Defining each machine player type

As can be seen from Tables A and B, five distinct types, or classes, of machine player were evident in the data. Membership of each class varied based on venue of machine play and were defined as follows:

- **Class 1:** had all played machines in pubs in the past year. 19% of this group also played machines in a bookmaker’s and 10% played machines in an amusement arcade. We have called this group ‘**mainly pub**’ machine players.

- **Class 2:** had all played machines in an amusement arcade and less than 1% also played machines in a casino. We have called this group '**amusement arcade only**' machine players.
- **Class 3:** had all played machines in bookmakers. Less than 10% respectively also played machines in an amusement arcade (9%) and a casino (7%). We have called this group '**mainly bookmaker**' machine players.
- **Class 4:** had played machines in a variety of different venues. One third (34%) played machines in a casino, 27% played machines in a sports club and 17% played machines in bingo hall. This group represents a catch-all category for people who play machines in other venues which are typically less popular than bookmakers, pubs or amusement arcades. We have called this group '**other venue**' machine players.
- **Class 5:** had all played machines in a pub in the past year and the vast majority also played machines in bookmakers or in an amusement arcade. Playing machines in a variety of other venues was also popular among this group. We have called this group '**multi-venue**' machine players.

Table B shows the relative size of each class, with mainly pub machine players representing 46% of all machine gamblers and multi-venue machine players accounting for 9% of machine gamblers.

Table B Size of classes of machine player types		
<i>Base: 1047</i>	<i>Percent</i>	<i>Unweighted base size</i>
	<i>%</i>	<i>n</i>
Class 1 – mainly pubs	46.0	482
Class 2 – amusement arcade only	18.5	194
Class 3 – mainly bookmakers	14.0	147
Class 4 – other venues	12.4	130
Class 5 – multi-venues	9.0	94
Total – all machine players	100	1047

4.1.4 Considerations

The groups described above represent groups of people and the analysis that follows looks at the profile of these groups. While this provides insight into the different types of machine player that may exist and how they vary from each other, it is important to remember that overlap remains between player types and venues. This means that at any one point in time the patronage of a venue may consist of more than one type of player. For example, the patronage of an amusement arcade could include ‘amusement arcade’ only and ‘multi venue’ players. This is discussed in more depth in Section 4.3.2. Furthermore, it should be noted that these machine player types are derived based on the data available to us. It may be possible that focus on regular gamblers, for example, produces different groups of machine player types. Therefore, this analysis highlights the potential groups of machine players that may be evident within the British population which have been identified using this source of data. This, we believe, provides useful insight into the diversity of behaviour and helps to better understand heterogeneity of machine play.

4.2 Profile of machine player types

To examine the profile of each machine player type, a series of logistic regression models were run to identify the characteristics which distinguished one type of machine player from another and predicted membership of each group.

The purpose of this analysis was to examine differences between each type of machine player. Therefore, to address this issue, regression models were developed in two stages:

- Firstly, a model was run to identify the characteristics associated with being a machine player overall compared with other (non-lottery only) gamblers. This identifies the key factors which distinguish machine gamblers from other types of gamblers.
- Secondly, a series of models were run to identify the characteristics which distinguished machine player types from each other.

This process allows us to trace key patterns and associations of both machine players generally and of specific machine player types. (Full details on how these models were developed and how they should be interpreted is given in Appendix B, Sections B and C.)

4.2.1 Factors associated with machine gambling overall

The following characteristics were entered into a logistic regression model:

- Age
- Sex
- Ethnicity
- Personal income quintile
- Whether in paid work or not
- Educational qualification
- Smoking status
- Alcohol consumption in past 7 days
- Problem Gambling Severity Index group¹⁰
- Whether parents gambled
- Age first gambled
- Number of gambling activities undertaken in the past 7 days.

Age, sex, ethnicity, smoking status, alcohol consumption, problem gambling status, age first gambled and number of activities undertaken in the past 7 days were all significantly associated with machine gambling. This means that these features differentiate machine players from other gamblers.

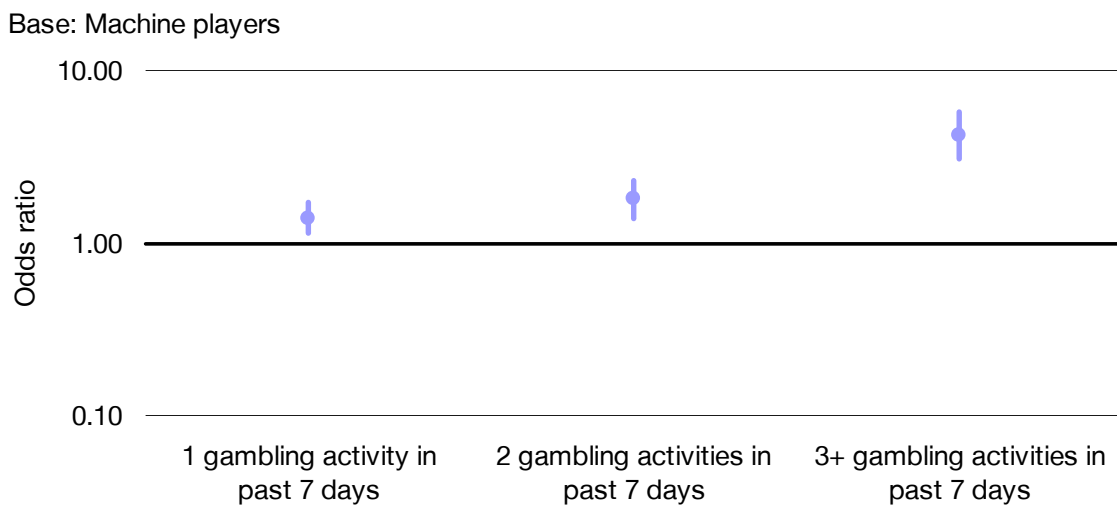
The broad patterns were that the odds of being a machine gambler were lower among older age groups and decreased with advancing age, indicating that machine players are typically younger than other gamblers. Among gamblers, men were more likely than women to be machine players and those with higher rather than lower alcohol

¹⁰ Problem Gambling Severity Index was used in the regression models rather than DSM-IV as it gives greater discrimination about levels of harm rather than being a binary measure of whether someone is a problem gambler or not. As the RGSB's strategy focuses on gambling-related harm more broadly, it was felt this would be useful analysis to present.

consumption or who were current smokers were also more likely to be machine players. This means that smoking and heavy drinking are predictive of machine gambling and that these patterns persist even when the younger age profile of machine players is taken into account. Among gamblers, those from non-white ethnic groups were less likely to be machine players.

Machine players also varied from other gamblers according to their self-reported gambling behaviour. The odds of being a machine player were higher among those who took part in at least one form of gambling in the past seven days and odds increased as the number of activities undertaken increased (see Figure J). This means that among gamblers, those who gamble most frequently are more likely to be machine players.

Figure J: Odds of being a machine player by number of gambling activities undertaken in past 7 days



Problem gambling status, as measured by the PGSI, was also significantly associated with machine gambling even after gambling involvement (as measured by the number of activities participated in) was taken into account. The odds of being a machine player were 5.42 times higher among PGSI problem gamblers than non-problem gamblers. Finally, the odds of being a machine player were lower among those who had started gambling at a later age.

This demonstrates that, compared with other gamblers, gambling behaviour such as higher involvement with gambling, earlier gambling onset and problem gambling status are predictive of machine play.

(Table 15)

Table 15 Odds of being classified a machine gambler*All past year gamblers (excluding lottery only)*

2010

Socio-demographic, lifestyle and gambling characteristics

	Odds ratio	95% CI - lower	95% CI - upper
Sex (p<0.01)			
Female	1		
Male	1.37	1.16	1.62
Age group (p<0.01)			
16-24	1		
25-34	0.76	0.58	1.00
35-44	0.40	0.31	0.52
45-54	0.34	0.25	0.45
55-64	0.19	0.13	0.27
65 and over	0.11	0.07	0.17
Ethnic group (p<0.05)			
White	1		
Non-white	0.66	0.46	0.94
Past week alcohol consumption (p<0.01)			
Does not drink/did not drink in past week	1		
Drank 1-4 units on heaviest drinking day	1.27	1.04	1.55
Drank 5-9 units on heaviest drinking day	1.42	1.11	1.81
Drank 10-14 units on heaviest drinking day	1.55	1.18	2.03
Drank 15+ units or more on heaviest drinking day	1.73	1.22	2.46
Smoking status (p<0.01)			
Non-cigarette smoker	1		
Current cigarette smoker	1.37	1.14	1.65
Number of activities undertaken in past 7 days (p<0.01)			
0	1		
1	1.39	1.13	1.71
2	1.79	1.40	2.29
3 or more	4.18	3.05	5.73
Age first gambled (p<0.01)			
15 or younger	1		
16-17	0.76	0.61	0.95
18-20	0.68	0.55	0.83
21 or older	0.49	0.35	0.69
PGSI categorization (p<0.01)			
Non-problem gamblers (PGSI score=0)	1		
Low risk gambler (PGSI score=1-2)	2.61	2.05	3.32
Moderate risk gambler (PGSI score 3-7)	3.29	2.00	5.42
Problem gambler (PGSI score 8+)	5.42	2.67	11.03
<i>Base (unweighted)</i>	1043		

4.2.2 Factors associated with machine gambling types

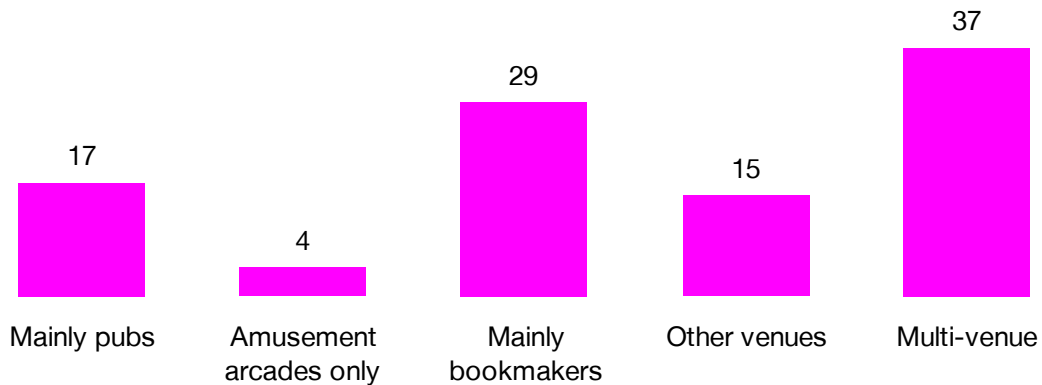
As described in the preceding section, a number of factors distinguish machine players from other gamblers. The next stage of analysis was to examine the extent to which these factors distinguished *between* machine player types.

Firstly, basic cross tabulations of machine player types by various gambling behaviour characteristics showed some notable differences. As shown in Figure K and Table 16,

levels of engagement in other gambling activities varied significantly between machine player types. For example, 37% of multi-venue players had taken part in three or more activities in the past 7 days whereas only 4% of amusement arcade only players reported the same.

Figure K: Percentage of machine players taking part in 3 or more gambling activities in the past 7 days, by machine player type

Base: Machine players



This highlights a broad pattern by which both multi-venue players and mainly bookmaker players had the highest levels of engagement both with gambling generally and with machines specifically. For example, 18% of mainly bookmaker machine gamblers and 16% of multi-venue machine gamblers played machines on two or more days per week. Equivalent estimates among amusement arcade only or other venue gamblers were 3% respectively. Likewise, mainly bookmaker and multi-venue machine players were more likely to be in the high time/high spend gambling volume groups¹¹ and were more likely to have spent greater amounts of money and time on machine gambling specifically.

(Table 16)

¹¹ For the 2010 BGPS report, data about money spent and time spent gambling was collated for all regular (at least monthly) gamblers. Four mutually exclusive groups were then identified – non-high time/non-high spend gamblers; high time/non-high spend gamblers; high spend/non-high time gamblers and high time and high spend gamblers. See Chapter 4 of the main BGPS report for further details (Wardle et al., 2011).

Table 16 Gambling behaviour, by machine player types

All machine players

2010

Gambling behaviour characteristics	Machine player type					All machine players	
	Mainly pub	Amusement arcade only	Mainly bookmakers'	Other venues	Multi-venues		
	%	%	%	%	%	%	
Time spent playing machines on a gambling day tertile							
1 st (lowest)	67	a	57	[73]	33	61	
2 nd	10	a	6	-	25	10	
3 rd (highest)	23	a	36	[27]	42	29	
Money spent playing machines in a month tertile							
1 st (lowest)	55	a	45	[69]	23	50	
2 nd	24	a	6	[11]	31	21	
3 rd (highest)	21	a	49	[20]	45	30	
Machine gambler volume sub-groups							
Non-high time/Non-high spend	68	a	41	[71]	38	58	
High time only	11	a	10	[9]	17	12	
High spend only	10	a	23	[2]	20	13	
High time and high spend	12	a	27	[18]	25	17	
Gambling volume sub-groups (all activities)							
Non-high time/Non-high spend	70	90	44	74	44	66	
High time only	6	5	11	6	6	7	
High spend only	9	2	7	8	16	8	
High time and high spend	15	3	37	11	35	19	
Highest frequency of playing machines							
2+ days per week	8	3	18	3	16	9	
Once a week	12	2	17	6	26	12	
Once a month, less than once a week	23	9	19	22	29	21	
At least once in past year, less than once a month	56	86	46	69	29	58	
Highest frequency of gambling (all activities)							
Every day/almost every day	6	2	13	6	8	7	
4-5 days per week	4	1	7	4	11	4	
2-3 days per week	20	15	26	15	24	20	
Once a week	33	29	26	41	32	32	
Once a month, less than once a week	21	18	15	15	20	19	
At least once in past year, less than once a month	17	35	14	18	5	19	
Number of gambling activities in past year							
1	3	11	2	7	-	4	
2	9	22	6	14	2	11	
3	17	24	11	20	7	16	
4	19	20	19	25	4	18	
5	19	15	23	15	8	18	
6	14	6	11	12	12	12	
7	19	2	29	6	67	21	
Number of gambling activities in past week							
0	32	51	26	26	20	33	
1	32	31	29	40	22	31	
2	19	14	15	19	21	18	
3	9	3	14	11	16	10	
4+	8	1	15	4	21	9	

Table 16 Cont...

All machine players

2010

Gambling behaviour characteristics	Machine player type					All machine players
	Mainly pub	Amusement arcade only	Mainly bookmakers'	Other venues	Multi-venues	
	%	%	%	%	%	%
Number of venues played machines in past year						
1 venue	65	98	83	98	-	71
2 venues	35	2	16	1	-	19
3 venues	-	-	1	1	54	5
4 venues	-	-	1	-	31	3
5 venues	-	-	-	-	11	1
6 venues	-	-	-	-	4	-
<i>Bases (weighted)</i>						
<i>Regular machine players</i>	228	27	90	39	77	460
<i>Past year machine players</i>	520	190	169	126	108	1112
<i>Bases (unweighted)</i>						
<i>Regular machine players</i>	209	25	79	38	67	418
<i>Past year machine players</i>	482	194	147	130	94	1047

^a 'a' indicates that base sizes are too small to present these results.

[] indicates that base sizes are small and some caution should be applied when interpreting these results.

This brief analysis demonstrates that there are further differences *within* machine gamblers and that not all machine gamblers are the same. A set of logistic regression models were developed to explore this in more detail, using the same set of characteristics described in Section 3.2.1.

Factors associated with being a 'mainly pub' machine player

Age, sex, alcohol consumption, cigarette smoking status and problem gambling status were significantly associated with being a mainly pub machine player. This means that these factors differentiate mainly pub machine players from other types of machine player.

Perhaps, unsurprisingly, among all machine players, men, those with the highest levels of alcohol consumption and those who were current cigarette smokers were all more likely to be mainly pub machine players. Whereas among machine players, those who were 'moderate risk' or 'problem gamblers' were less likely to be mainly pub machine players. Those aged 55 and over were also less likely to be mainly pub machine players.

(Table 17)

Table 17 Odds of being classified a ‘mainly pub’ machine gambler

2010

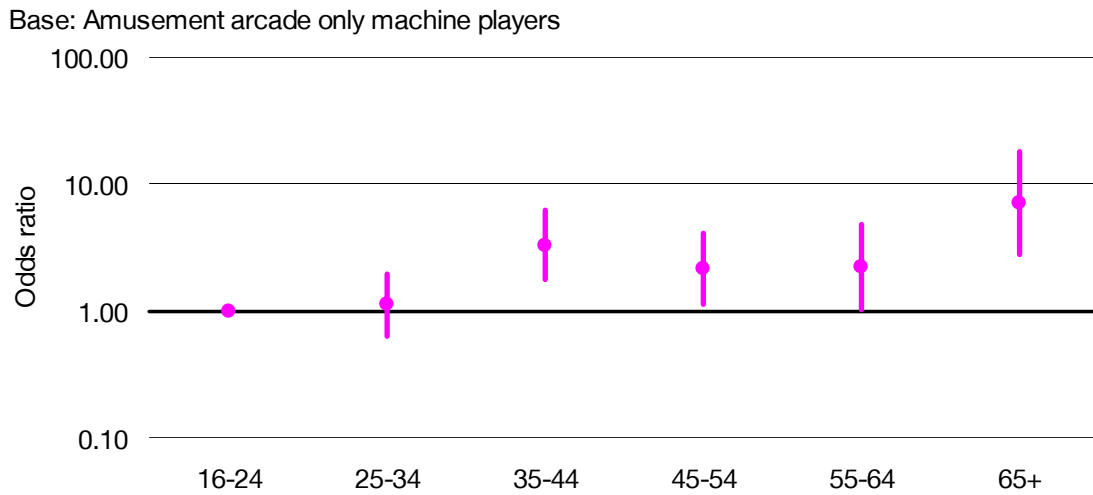
Socio-demographic, lifestyle and gambling behaviour characteristics	Odds ratio	95% CI - lower	95% CI - upper
Sex (p<0.01)			
Female	1		
Male	1.62	1.21	2.18
Age group (p<0.01)			
16-24	1		
25-34	1.32	0.86	2.00
35-44	1.09	0.69	1.71
45-54	0.77	0.46	1.29
55-64	0.49	0.27	0.87
65 and over	0.22	0.09	0.54
Past week alcohol consumption (p<0.05)			
Does not drink/did not drink in past week	1		
Drank 1-4 units on heaviest drinking day	1.39	0.97	1.99
Drank 5-9 units on heaviest drinking day	1.41	0.92	2.15
Drank 10-14 units on heaviest drinking day	1.64	1.01	2.65
Drank 15+ units or more on heaviest drinking day	2.37	1.46	3.84
Smoking status (p<0.01)			
Non-cigarette smoker	1		
Current cigarette smoker	1.63	1.20	2.23
PGSI categorisation (p<0.01)			
Non-problem gamblers (PGSI score=0)	1		
Low risk gambler (PGSI score=1-2)	0.89	0.62	1.29
Moderate risk gambler (PGSI score 3-7)	0.53	0.31	0.91
Problem gambler (PGSI score 8+)	0.21	0.08	0.57
<i>Base (unweighted)</i>	481		

Factors associated with being a ‘amusement arcade only’ machine player

Age, sex, number of gambling activities undertaken in the past year and age first gambled were significantly associated with being an amusement arcade only machine player.

Arguably, this group had the most varied demographic and gambling behaviour profile when compared with other machine players. For example, men were less likely than women to be amusement arcade only machine players. When compared with those aged 16-24, odds were also higher among most other age groups and were 7.04 times higher among those aged 65 and over (see Figure L), demonstrating the older age profile of this group.

Figure L: Odds of being an amusement arcade only machine player, by age group



Among machine players, those who had participated in one or more form of gambling in the past seven days were less likely to be amusement arcade only machine players. In fact, the odds displayed an inverse relationship with the odds of being an amusement arcade only player decreasing as the number of activities undertaken in the past week increased. However, similar to mainly pub players, those who had first gambled at a later age were less likely to be amusement arcade only machine players.

This means that compared with other machine players, amusement arcade only machine gamblers are more likely to be female, to be older and less likely to be involved in other forms of gambling.

(Table 18)

Table 18 Odds of being classified an ‘amusement arcade only’ machine gambler

2010

Socio-demographic, lifestyle and gambling characteristics	Odds ratio	95% CI - lower	95% CI – upper
Sex (p<0.01)			
Female	1		
Male	0.25	0.17	0.37
Age group (p<0.01)			
16-24	1		
25-34	1.12	0.63	1.97
35-44	3.28	1.74	6.20
45-54	2.14	1.12	4.09
55-64	2.20	1.01	4.77
65 and over	7.04	2.76	17.94
Smoking status (p<0.05)			
Non-cigarette smoker	1		
Current cigarette smoker	0.62	0.40	0.98
Number of gambling activities undertaken in past week (p<0.01)			
0	1		
1	0.55	0.37	0.83
2	0.40	0.22	0.73
3 or more	0.13	0.06	0.29
Age first gambled (p<0.01)			
15 or younger	1		
16-17	0.62	0.37	1.02
18-20	0.39	0.24	0.63
21 or older	0.78	0.37	1.66
<i>Base (unweighted)</i>	192		

Factors associated with being a ‘mainly bookmaker’ machine player

Age, sex, age first gambled and ethnicity were significantly associated with being a mainly bookmaker machine gambler meaning that these factors differentiate this group from other machine players. For example, men were more likely than women to be ‘mainly bookmaker’ machine players. Overall age was predictive of being a mainly bookmaker machine player, but the only category which differed from the reference group of those aged 16-24 was those aged 65 and over, who were less likely to be mainly bookmaker machine players.

Compared with other machine players, those from non-White ethnic groups were more likely to be mainly bookmaker machine players.

Unlike both mainly pub and amusement arcade only machine players, those who had first gambled from an older age (age 16 upwards) were more likely to be mainly bookmaker machine players. Indeed, the odds of belonging to this group increased as age of first gambling increased.

None of the other gambling behaviour characteristics differentiated this type of machine player from other types of machine players.

(Table 19)

Table 19 Odds of being classified a ‘mainly bookmaker’ machine gambler

Socio-demographic, lifestyle and gambling characteristics	Odds ratio	95% CI - lower	95% CI - upper
Sex (p<0.01)			
Female	1		
Male	2.79	1.65	4.72
Age group (p<0.051)			
16-24	1		
25-34	0.67	0.40	1.11
35-44	0.61	0.32	1.19
45-54	1.03	0.54	1.96
55-64	0.53	0.24	1.18
65 and over	0.26	0.09	0.82
Ethnic status (p<0.05)			
White	1		
Non-White	2.39	1.06	5.40
Age first gambled (p<0.01)			
15 or younger	1		
16-17	1.86	1.18	2.93
18-20	2.12	1.30	3.46
21 or older	3.09	1.27	7.51
<i>Base (unweighted)</i>	147		

Factors associated with being a ‘other venue’ machine players

Only age, sex and ethnicity differentiated this type of machine player from other groups. Men were less likely to be an ‘other venue’ machine player whereas those who were older were more likely to be this type of machine player. This association may be driven by the inclusion of people who played machines in bingo halls within this group. Like mainly bookmaker machine players, those who were non-White were more likely to be an ‘other venue’ machine player.

(Table 20)

Table 20 Odds of being classified an ‘other venue’ machine gambler

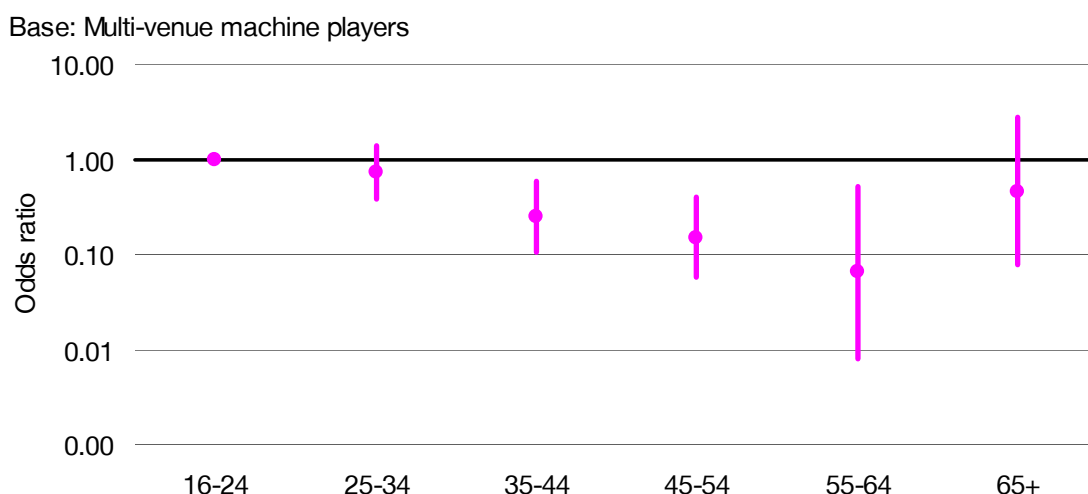
2010

Socio-demographic, lifestyle and gambling characteristics	Odds ratio	95% CI - lower	95% CI - upper
Sex (p<0.05)			
Female	1		
Male	0.61	0.38	0.96
Age group (p<0.01)			
16-24	1		
25-34	0.73	0.34	1.56
35-44	0.93	0.46	1.88
45-54	2.61	1.26	5.42
55-64	5.46	2.35	12.73
65 and over	3.74	1.38	10.13
Ethnic status (p<0.05)			
White	1		
Non-White	2.35	1.07	5.15
<i>Base (unweighted)</i>	130		

Factors associated with being a ‘multi-venue’ machine players

Factors predicting membership of the multi-venue group included age, educational qualifications and employment status. The relationship with age was that, among machine players, those aged 35-64 were less likely than those aged 16-24 to be a ‘multi-venue’ machine player (see Figure M). However, among machine players, those not in paid employment were more likely than those in paid employment to be a ‘multi-venue machine player. Educational qualifications were associated with membership of this group, although the odds associated with different levels of attainment varied with no clear pattern.

Figure M: Odds of being a multi-venue machine player, by age group



Number of gambling activities undertaken in the past seven days, problem gambling status and age first gambled were significantly predictive of membership of the multi-venue group. This means that these factors differentiate this group from other machine players. Compared with other machine players, those who gambled on two or more activities in the past seven days were more likely than those who had not gambled in the past seven days to be a multi-venue machine player. Odds were lower among those who were at least 16 the first time they gambled, meaning that multi-venue machine players were likely to have tried gambling at a younger age than other machine players. Finally, the odds of being a multi-venue machine player were 6.45 times higher among problem gamblers and 4.17 times higher among moderate risk gamblers than non-problem gamblers. This illustrates how problem gambling status differentiates this group of machine players from the other groups and that problem gambling status, along with high levels of gambling involvement, is a predictor of being a multi-venue machine player.

(Table 21)

Table 21 Odds of being classified a ‘multi-venue’ machine gambler

All machine players

2010

Socio-demographic, lifestyle and gambling characteristics

	<i>Odds ratio</i>	<i>95% CI - lower</i>	<i>95% CI - upper</i>
Age group (p<0.01)			
16-24	1		
25-34	0.72	0.38	1.38
35-44	0.25	0.11	0.59
45-54	0.15	0.06	0.39
55-64	0.06	0.01	0.51
65 and over	0.46	0.08	2.76
Employment status (p<0.05)			
In paid work	1		
Not in paid work	2.10	1.03	4.28
Educational qualifications (p<0.05)			
Professional qualifications or higher	1		
A-level/o-level or equivalent	0.97	0.55	1.70
Other/none	0.29	0.10	0.82
PGSI categorisation (p<0.01)			
Non-problem gambler (PGSI score=0)	1		
Low risk gambler (PGSI score=1-2)	1.84	0.96	3.50
Moderate risk gambler (PGSI score 3-7)	4.17	1.98	8.79
Problem gambler (PGSI score 8+)	6.54	2.23	19.17
Number of activities undertaken in past 7 days (p<0.01)			
0	1		
1	1.23	0.58	2.59
2	2.56	1.20	5.42
3 or more	4.11	1.81	9.36
Age first gambled (p<0.05)			
15 or younger	1		
16-17	0.52	0.29	0.91
18-20	0.35	0.17	0.70
21 or older	0.37	0.08	1.68
<i>Base (unweighted)</i>	94		

4.3 Motivations and attitudes among machine player types

4.3.1 Motivations

Having established that the profiles of machine player types vary, motivations for gambling and attitudes towards gambling were also examined.

Questions about why people gambled were included for the first time in BGPS 2010. Participants were asked to report why they gambled in general rather than why they gambled on specific products. Therefore, the information that follows does not necessarily refer to reasons for playing machines but rather refers to broader reasons for engagement in gambling.

Overall, gambling because 'it's fun' was the reason given most often by all machine player types. Estimates varied from 49% of mainly bookmaker machine players to 71% of 'multi-venue' machine players who said that they often or always gambled for this reason. This was closely followed by gambling to win big money, which also motivated many of each machine player type.

Other reasons for gambling were endorsed by each machine player type to differing extents. For example, whilst multi-venue players were much more likely than other groups to state that they often or always gambled because it was fun (71%) or exciting (42%), 21% also stated that they gambled to escape boredom and 16% said that they gambled because they were worried about not winning if they didn't play.

Mainly bookmaker machine players had quite distinct motivations for gambling. They too generally reported gambling because it was fun (49%), to win big money (46%) or to make money (46%), indicating that monetary motivations for gambling are important for this group. However, this group were most likely to report that they always or often gambled because of a sense of achievement when they won (40%) or for the mental challenge (38%). Overall, relatively few machine players stated that they gambled to impress others, or because it helps when they were feeling tense. However, mainly bookmaker players were most likely to state that they gambled for these reasons (6% and 4% respectively). This means that around 1 in 20 mainly bookmakers' machine players gamble to relieve tension or try to impress others.

For other machine player types, reasons for gambling varied without distinct pattern, except for the main observation that machine players, like many others, tend to gamble for the fun, for the money and for the excitement.

(Table 22)

Table 22 Motivations for gambling among machine player sub-types

All machine players

2010

Motivations for gambling	Machine player sub-type					All
	Mainly pub	Amusement arcades only	Mainly bookmakers	Other venues	Multiple venues	
	%	%	%	%	%	
Chance of winning big money						
Never/sometimes	49	54	54	46	45	50
Often/always	51	46	46	54	55	50
Because it's fun						
Never/sometimes	47	43	51	46	29	45
Often/always	53	57	49	54	71	55
Escape boredom/fill my time						
Never/sometimes	91	87	87	90	79	89
Often/always	9	13	13	10	21	11
I'm worried about not winning if I don't play						
Never/sometimes	92	91	93	91	84	91
Often/always	8	9	7	9	16	9
Compete with others						
Never/sometimes	95	98	87	98	92	94
Often/always	5	2	13	2	8	6
It's exciting						
Never/sometimes	72	75	66	75	58	71
Often/always	28	25	34	25	42	29
Mental challenge or to learn about the game						
Never/sometimes	91	92	79	96	82	89
Often/always	9	8	21	4	18	11
Sense of achievement when I win						
Never/sometimes	79	83	60	76	62	75
Often/always	21	17	40	24	38	25
Impress other people						
Never/sometimes	99	99	96	97	97	98
Often/always	1	1	4	3	3	2
Be Sociable						
Never/sometimes	85	89	81	86	76	84
Often/always	15	11	19	14	24	16
Helps when I'm feeling tense						
Never/sometimes	98	99	94	97	96	97
Often/always	2	1	6	3	4	3
To make money						
Never/sometimes	66	72	54	68	59	65
Often/always	34	28	46	32	41	35
Hobby or pastime						
Never/sometimes	81	83	71	76	66	78
Often/always	19	17	29	24	34	22
To relax						
Never/sometimes	91	93	82	86	84	89
Often/always	9	7	18	14	16	11
It's something I do with my family or friends						
Never/sometimes	79	74	74	74	70	76
Often/always	21	26	26	26	30	24
<i>Bases</i>						
<i>Weighted</i>	519	188	169	125	108	1108
<i>Unweighted</i>	481	192	147	129	94	1043

4.3.2 Attitudes

Attitudes towards gambling were assessed using the ATGS-8 developed for the BGPS 2010. This presented participants with eight statements, four of which represented positive views of gambling and four of which represented negative views of gambling. Participants were asked to rate agreement to each one. An overall attitude score was calculated from these responses. A score of 24 represents neutral attitudes to gambling, a score of less than 24 represents somewhat negative attitudes to gambling and a score of more than 24 represents positive attitudes to gambling.

Unsurprisingly, given the varying levels of gambling engagement and motives observed between these groups, attitudes towards gambling also varied by machine player type.

Multi-venue machine players had the most positive attitudes towards gambling with a mean attitude score of 25.6. Mainly pub and mainly bookmaker machine players also, on average, held positive attitudes towards gambling with average attitude scores of 24.4. On the whole, amusement arcade only and other venue players had somewhat negative attitudes towards gambling with mean scores of 22.6 and 23.4 respectively.

Given this, responses to specific attitude items showed the general pattern that multi-venue players tended to agree with the positive aspects of gambling and disagree with the negative aspects of gambling more strongly than other groups. The converse was true for amusement arcade only gamblers.

However, there were some interesting anomalies to this pattern. For example, mainly bookmaker machine gamblers agreed in greatest number that people should have the right to gamble whenever they want. Somewhat paradoxically this group also agreed in equal numbers with their amusement arcade only and other venue counterparts that there were too many opportunities for gambling nowadays (around 3 in 4 of each group agreed with this statement). Interestingly, mainly bookmaker machine players were the least likely to agree that most people who gambled did so sensibly.

(Table 23)

Table 23 Attitudes towards gambling among machine player sub-types

All machine players

2010

Endorsement of each attitude statement and mean scores	Machine player type					All
	Mainly pub	Amusement arcades only	Mainly bookmaker	Other venues	Multi-venues	
	%	%	%	%	%	
People should have the right to gamble whenever they want						
Strongly agree/agree	69	55	80	59	74	68
There are too many opportunities for gambling nowadays						
Strongly agree/agree	61	74	73	73	64	67
Gambling should be discouraged						
Strongly agree/agree	22	42	23	30	18	26
Most people who gamble do so sensibly						
Strongly agree/agree	37	36	28	36	43	36
Gambling is dangerous for family life						
Strongly agree/agree	41	60	48	53	33	46
On balance, gambling is good for society						
Strongly agree/agree	19	16	20	12	22	18
Gambling livens up life						
Strongly agree/agree	27	24	37	26	39	29
It would be better if gambling were banned altogether						
Strongly agree/agree	5	8	9	10	6	7
Mean attitude score	24.4	22.6	24.4	23.4	25.6	24.1
Standard error of the mean	.18	.33	.36	.37	.44	.14
<i>Bases</i>						
<i>Weighted</i>	519	188	169	125	108	1108
<i>Unweighted</i>	481	192	147	129	94	1043

What this highlights is the complex relationship between attitudes and behaviour. The ‘amusement arcade only’ group are most interesting in this respect. They are past year gamblers, engaging with machines at a very specific venue type, but even so typically have more negative attitudes towards gambling. This may seem contradictory but could indicate the presence of ‘a third person effect’ whereby certain players think that, on the whole, gambling is not positive but that it doesn’t apply to them (i.e., the risks are greater for other people) or could simply indicate that the excitement and fun offered by the activity outweighs their negative attitudes to gambling in general. Further work is needed to unpack this relationship.

4.4 Discussion

4.4.1 Summary of findings

In recent years, there has been increasing interest in machine gambling in Great Britain, and specifically, its relationship to gambling-related harm. The rhetoric surrounding machine gambling (especially by media) tends to assume that machine gamblers are a relatively homogenous group and have similar levels of risk of harm. However, the British machine gambling market is diverse and therefore one would expect the profile and behaviour of machine players to be equally diverse. Yet to date, there has been

very little exploration of this. What research has been conducted was produced prior to the introduction of the (then called) fixed odd betting terminals in bookmakers. This report aimed to address this gap and based on analysis of where people play machines has identified five potentially distinct groups of machine players, each with a different profile, motivations and attitudes towards gambling.

Those who mainly played machines in a pub made up around 46% of the past year machine players. Their profile and patterns of involvement in other gambling activities were therefore similar to all machine players generally, with the exceptions that they were more likely to be male, to be younger and consume more alcohol than other machine players. Interestingly, this group had an inverse relationship with problem gambling status, meaning that comparative to other machine players problem gambling status was less likely to predict membership of this group. In some ways, this group are the epitome of the causal machine player. Some did play machines fairly often (i.e., once a week or more) but they typically played less regularly than this and were less engaged in other forms of gambling than some other machine players.

The amusement arcade only group were particularly interesting. This was the only group where the proportion of women outnumbered the proportion of men. This group also tended to be older than other machine players. They had the lowest levels of engagement in machine gambling and also of gambling more generally, though notably, problem gambling status did not differentiate this group from other machine players. This is surprising given lower levels of gambling engagement observed among amusement arcade only players and, perhaps, is an artefact of smaller base sizes observed among this group; they accounted for less than 20% of all machine players. As noted above, they had very specific attitudes towards gambling, being more negative than positive, though interestingly around two thirds of this group reported playing machines at least once a month. That said, their volume of play was low which may lend support to the presence of a 'third person' effect when they were thinking about gambling more broadly when answering attitudinal questions.

The mainly bookmaker machine group made up 14% of all machine players the majority of whom were men. They were much more likely to be from non-white ethnic groups than other machine players. Interestingly, they were the only group whose membership was predicted by starting to gamble at an older age, rather than younger age. They were strongly engaged in other forms of gambling and with machine gambling itself, having the highest frequency of machine play of all groups (18% played on two or more days per week) and having higher proportions in the high time/high spend group. Many of these are typically viewed as risk-factors for the experience of gambling-related harm and certainly high levels of gambling involvement suggest that attention be given to this sub-group of machine player. That said, 46% of this group also played on machines less than once month, further highlighting how different patterns of play are evident *within* these groups. This reminds us that even within machine player types, there is a

heterogeneity of play patterns – some are very engaged in machine gambling, others less so. This range may help account for the somewhat varying motivations and attitudes towards gambling evident among this group, with mainly bookmaker machine players being least likely to agree that most people gamble sensibly and stating equally to those with more negative attitudes that there were too many opportunities for gambling nowadays.

Other venue machine players were a catch all group and we acknowledge that with a larger sample size it would have been useful to separate out bingo hall machine players and casino machine players. As such, their profile was somewhat varied. They tended to have lower levels of engagement in gambling and machine gambling generally and more negative attitudes towards gambling.

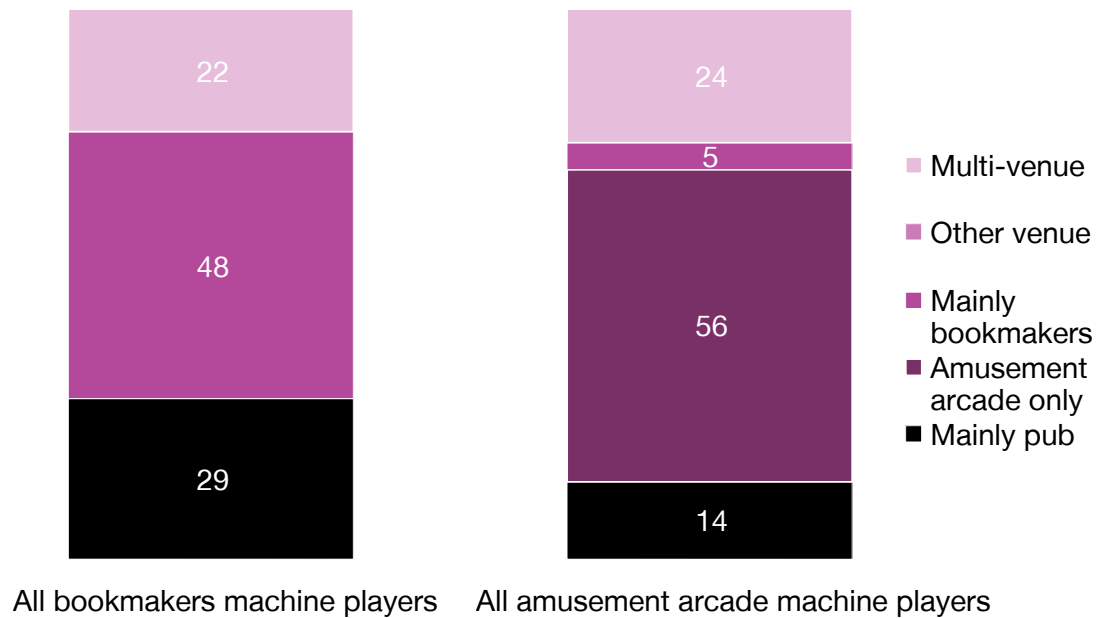
Finally, the multi-venue machine group made up around 9% of all machine players. This group were disproportionately male, younger and were heavily engaged in gambling (over two thirds had taken part in seven or more different gambling activities in the past year). Like mainly bookmaker machine players, they too had a greater proportion within the high time/high spend gambling groups. They were the only group where, compared with other machine gamblers, problem gambling status positively predicted membership of this group. Indeed 59% of this group were categorised as low risk, moderate risk or problem gamblers. They also had the most positive attitudes towards gambling, which is unsurprising given their high levels of engagement.

Multi-venue machine players can and should be viewed as a key group (potentially) vulnerable to the experience of gambling-related harm. This also suggests that a more strategic and joined-up approach across operators and venues regarding prevention and education about gambling-related harm may be beneficial. If those who play in multi-venues represent a specific vulnerable group for the experience of gambling-related harm, then having the same messages and same strategies implemented consistently across all operators and all venue types gives a greater chance to intervene with this group, who make up around 1 in 10 machine players.

4.4.2 Considerations

We caution operators to review these results with care, For example, just because amusement arcade only gamblers were less engaged with gambling generally and machine gambling specifically, does not imply that the risk of gambling-related harm should be discounted among amusement arcade players overall. Rather, it needs to be viewed in context of the whole population of people who play machines at each venue. To demonstrate this, the chart opposite shows the proportion of amusement arcade gamblers and bookmaker machine gamblers who were categorised as each machine player type. As can be seen, 48% of people who played machines in bookmakers in the

past year and 56% of those who played machines in an amusement arcade were categorised as mainly bookmakers' or amusement arcade only machine players respectively. However, 22% and 24% of each group were also multi-venue machine players. This further highlights the diversity of machine players and the levels of overlap of player types found in different venues.



As with any research, some limitations should be borne in mind when reviewing these results. Firstly, machine player types are based on those who played machines in the past year. It is likely that more regular machine players have different venue and machine preferences and that a different typology may be apparent among more regular machine players. Secondly, as noted above, the other venue group was not particularly satisfactory as we were unable to separate out casino and bingo machine players. Thirdly, it is possible that there is some classification error between groups. We did not have information about how often people played at each venue, therefore it is possible that someone who played machines in a pub once in the past year but plays machines regularly elsewhere has been classified as a multi-venue machine player, for instance. Our data does not allow us to identify such situations. Finally, our objective was not to examine which types of machines in which venues are more harmful than others (indeed, this would be difficult to do with the data available to us) but rather to examine how machine players vary from one another. We therefore caution against over-interpreting these results.

That said, these results show that multi-venue and mainly bookmaker machine players are the two types of past year machine gamblers who appear to be more engaged with gambling generally and more engaged with machine gambling specifically. The majority of each were male and younger. Together, this fits the 'typical' profile of those more

likely to experience gambling-related harm and suggests that attention is given to these groups in relation to the development of responsible gambling strategy and practice.

Appendix A Latent Class Analysis

A typology of machine players was constructed using Latent Class Analysis (LCA). This approach categorises individuals into different groups, or 'latent classes' based on responses to a series of questions.

LCA was chosen as the best method of identifying types of machine players after data were explored in a number of ways. Firstly, machine venue data were examined through a series of cross tabulations to explore if machine players could be grouped without using cluster, factor or other data reduction techniques. However, given the range of combinations of machine play in different venues, mutually exclusive and meaningful groups suitable for analysis could not be identified. For example, participants were asked to report all the venues where they had played machines in the past 12 months. This gave rise to a large number of unique combinations of venues of play, some of which had base sizes as small as 9 people (i.e., 9 participants had played machines in a pub and somewhere else in the past year). This variety would not allow meaningful analysis to be produced and groups would have to be merged. Because of this, we decided to use a statistical technique to create manageable and meaningful groups.

We examined correlation coefficients between venues of play and produced factor analysis to group various measures of machine play. However, this did not yield satisfactory results, with only two factors (or groupings) of machine variables being evident – slot machine play and play in bookmakers. Inspection of the data suggested that more meaningful groups may be apparent than this dichotomy.

We explored the use of LCA to examine 'latent classes' of machine players. LCA consists of a) identifying the number of classes that best fit the data and b) generating probabilities for each individual that they belong to each class. Once this is done, an individual is assigned to the class for which they have the highest probability of membership.

A key aspect of LCA is the identification of the number of 'latent classes' which best fit the data. In order to do this, a number of models, each containing a pre-specified number of classes, were produced. In this case, the models tested ranged from those with 2 classes to those with 7 classes. The results from each model were then compared to select the most appropriate results based on both statistical and substantive considerations.

When determining which LCA model best fits the data, there are a number of considerations to take into account. The first is examination of various statistics of goodness of fit. Recommended guidelines are that a model which fits the data well

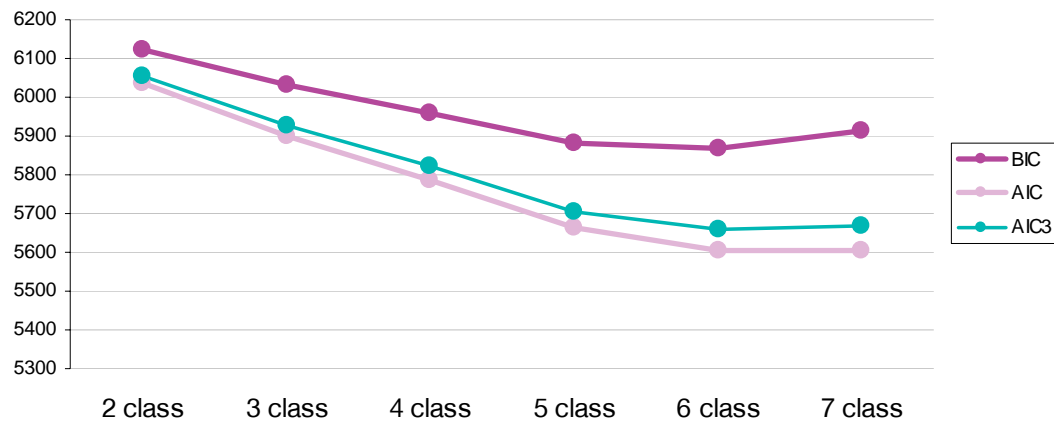
should have lower BIC, AIC and AIC3 values, although BIC has been highlighted as the most robust and consistent statistic to consider (McLachan & Peel, 2000; Roeder & Wasserman, 1997).

The fit statistics for all models are shown in Figure A1.

Based on these statistics alone a five and six class solutions fit the data well.

Figure A1: Fit statistics for 2-7 class solutions

Base: Fit statistics



To further examine which is preferable, class size, probabilities of membership and parsimony were considered. In relation to class size, one needs to have sufficient members of a class to enable analysis to be produced. Our six class solution yielded a sixth class with only 60 members making analysis of this group problematic. Furthermore, it is important that classes do not have large proportions of members where the probability of membership is low (for example, if a number of individuals allocated to a particular class have a low probability of being a member of that group, then doubts over how valid that class is may be raised). The five class solution showed that the average probability of membership for each class was between 0.84 and 0.999 (see Table A.1). Finally, the principle of parsimony suggests that a model with fewer parameters should be preferred over a model with more parameters, so long as it fits the data well.

Table A.1 Average probability of membership of each group

<i>Base: 1047</i>	<i>Mean probability of membership</i>	<i>Standard deviation</i>
Class 1 – mainly pubs	0.87	0.18
Class 2 – amusement arcade only	0.99	0.04
Class 3 – mainly bookmakers	0.99	0.02
Class 4 – other venues	0.999	0.01
Class 5 – multi-venues	0.84	0.15

This, combined with the fit statistics and the observed class sizes suggested that a five class solution fit the data well.

In addition to these considerations, it is also important that the resulting classes have a meaningful interpretation. We observed that each class was distinctive from the others and did have a meaningful interpretation, though we acknowledge that class 4 – other venues - is a ‘catch all’ group of machine players not elsewhere categorised. With a bigger sample size it may have been possible to separate out further.

Appendix B Logistic Regression Models

A) Modelling changes over time

Part 1 of this report looks at changes in the profile of machine players since 1999 and highlights the differences noted. However, when looking at how the profile of a sub-population (in this case machine players) has changed between survey years, it is important to assess whether the changes are 'real' or whether they may be an artefact of a) broader underlying population changes since 1999 or b) changes in who responded to the survey. To examine this, two logistic regression models were developed to look at how the responding profile of each survey year varied according to a range of demographic, socio-economic and health and lifestyle characteristics. The first model compared the responding profile of BGPS 1999 with BGPS 2010 by age, sex, educational qualifications and marital status. These were the only variables that were comparable between survey years.

Survey year was the outcome variable and the model examined the odds of being classified within a certain demographic group in 2010 compared with 1999. The results showed that there were no differences by sex, thereby meaning we can be confident that the changing profile of machine players by sex are 'real' changes. However, there were some differences observed by age, educational qualifications and marital status. Participants in 2010 were slightly older than in 1999. As each survey was weighted to reflect the age profile of the population apparent at that time, this probably reflects underlying changes in the age profile of Great Britain. In 2010, participants were slightly more likely to be single, separated or divorced than married when compared with the marital status of participants in 1999, whilst in 2010 more participants were educated to professional qualification/degree level. Comparison of the profile of BGPS 2010 participants by educational attainment with equivalent estimates from contemporaneous surveys also indicates that this is likely to reflect broader changes at a population level.

A second model was run to examine differences in the profile of participants between 2007 and 2010 as there was a greater level of comparable data available. This showed that in 2010, the responding sample was less likely to have drunk alcohol in the preceding 7 days and were more likely to be in poor health. Ethnicity and smoking status did not vary between survey years. These differences should be borne in mind when interpreting results and have been noted, where appropriate, within this report.

B) Models predicting membership of each machine group

The final regression models presented in this report (Chapter 3) were carefully developed and tested. Models were built and tested in iterative fashion, starting with age and sex, and then expanded to examine the impact of inclusion of various other

explanatory factors. Models were first run for demographic and socio-economic characteristics only and then for gambling behaviour characteristics only (with age and sex as controls). The final models included both socio-demographic and gambling behaviour variables combined. For each model, variables were included which were either shown to be associated with machine play in the main BGPS series (or within this report) or were likely to differentiate machine players from other gamblers (such as age first gambled). Much emphasis has been placed on the need to account for broader gambling engagement when looking at the relationship between certain forms of gambling behaviour and problem gambling (cf. Wardle et al., 2011; LaPlante et al., 2011). In this report, number of activities undertaken in the past week was used a proxy for gambling engagement, though results were similar when number of gambling activities undertaken in the past year was used instead.

These models were run on a subset of the BGPS data (machine players only). Therefore, it was important to retain as many observations as possible within each model. To do this, variables were examined to ensure that there were sufficient numbers of each machine player type within individual variable categories to allow the model to run without dropping cases. Where needed, some variable categories were combined (i.e., economic activity was dichotomised into 'paid work' vs. 'not paid' work) to enable inclusion of this variable into the model. However, some variables could not be included as categories could not be combined in a meaningful way. For example, nearly all machine players reported that their general health was good or fair. Across all machine player types, very few reported that their health was bad meaning that there was not sufficient differentiation in self-reported general health to warrant including this characteristic. However, to ensure that excluding general health from the model would not effect other associations, models were tested including and excluding general health and it did not affect overall results.

The same sets of variables were entered into all models so that results could be compared between machine player groups. These were:

- Age
- Sex
- Ethnicity
- Personal income quintile
- Marital status
- Whether in paid work or not
- Educational qualification
- Smoking status
- Alcohol consumption in past 7 days
- Problem Gambling Severity Index group
- Whether parents gambled
- Age first gambled
- Number of gambling activities undertaken in the past 7 days.

Only variables which were significant in the final model are shown in Tables 16 to 21.

C) Interpreting logistic regression models

For all models presented in Tables 16 to 21, the independent variable is significantly associated with the outcome variable if $p < 0.05$. The odds associated with the outcome variable are presented for each category of the independent variable. Odds are expressed relative to a reference category, which is given a value of 1. An odds ratio greater than 1 indicates higher odds of the outcome of interest (i.e., being a machine player). An odds ratio less than 1 indicates lower odds of the outcome of interest. 95% confidence intervals are also shown for each odds ratio. If the interval does not include 1, there is a significant difference between the odds ratio for the category and that of the reference category.

Appendix C References

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