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Female gambling behaviour: a case study of realist description

Technical appendix

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Contents

Appendix A: overview of surveys

British Gambling Prevalence Survey series

Overview

The British Gambling Prevalence Survey (BGPS) is a nationally representative survey of adults aged 16 and over living in private households in Great Britain. Data collection was undertaken in 1999, 2007 and 2010. For each survey year, the data collection method was broadly similar and the questionnaire focused on collecting data about a) past year gambling participation, b) past week gambling participation, c) problem gambling prevalence and d) attitudes to gambling. In 2010, the questionnaire also included questions about gambling motivations and collected more detail on how people gambled (i.e., online or offline). In 1999 and 2010, over 7000 adults took part in the survey; in 2007 over 9000 adults took part as the client (the Gambling Commission) wanted a larger sample size. Data is deposited in the UK data archive and full technical details are given in the supplementary material submitted to the archive. (Technical details are also given in the full reports for each survey, see Wardle et al, 2007; Wardle et al, 2011 and Sproston, Erens & Orford, 2000.)

Survey methodology

Each survey used the same sampling methodology; a stratified and clustered random probability sample was drawn from the Small Users Postcode Address File. These addresses were issued to trained NatCen Social Research interviewers who attempted to make contact with those at the address. All those living at the address aged 16 and over were eligible to take part in the survey. In 1999 and 2007, all data was collected using a confidential paper self-completion questionnaire. The interviewer either waited whilst the participant filled it out or returned to the household to collect it at a later date. In 2010, data was collected using confidential computer-assisted self-interviewing, so that more complex questionnaire routing

could be used. Response rates to the study varied from 65% in 1999 to 52% in 2007 to 47% in 2010.

Use in this thesis

Data from the 1999, 2007 and 2010 studies was combined into a single dataset for this thesis. This involved a process of checking and matching all variables which were consistent across the three datasets and creating compatible variables where necessary. This dataset was used in the trend analysis presented in Chapter 5. A number of new variables were derived for the trend analysis (for example, the public/private domain variables, scoring the DSM-IV out of 30 rather than 10 etc). The 2010 data was used in Chapter 6 to look at female groups of gambling behaviour. Latent class groups identified using Latent Gold were merged onto the 2010 dataset. A number of other new variables were derived for the regression analysis. This includes (but is not limited to) aggregating the number of people in the household who gambled using the household serial number, calculating the number of people (adults and children) in the household, creating variables for parental status and merging excess risk ratios, calculated in GeoDa, onto the 2010 dataset. Master copies of the combined series dataset and the 2010 data have been deposited at dropbox (full link given at the end of this section), along with syntax files for the derived variables, so that other researchers can use this resource. Variables needed for the survival analysis were created in PASW and data transferred to Stata v12 for the survival analysis. All regression models were run in stata. Do files for this analysis have also been deposited at dropbox.

Limitations

The BGPS series is the largest study of gambling behaviour available in Great Britain. However, like any research study, it has limitations. Firstly, it is a study of people living in private households. This means anyone living in an institution, like a care home, a prison, a student halls of residence are excluded from the study. Secondly, response rates fell significantly between 1999 and 2010, meaning that additional non-response biases may account for some changes observed in the data. In each

survey year, the data was weighted to account for non-response and to calibrate the achieved sample back to the age, sex and regional distribution of the British population but other biases may be evident. Finally, although confidential self-completion was the mode of administration there still may have been some participants who were unwilling to report their gambling behaviour or who misreported their behaviour, affecting the accuracy of results. However, assuming social desirability biases are constant across all groups and all survey years (which, admittedly, may not be the case) this limitation is likely to be of lesser importance.

Taking Part survey

Overview

The Taking Part survey is an annual cross sectional survey of adults and children living in private households in England. It collects information about participation in the arts, museums, archives, libraries, heritage and sports sectors. For each sector, reasons for participating or not participating, barriers to participation and frequency of participation were collected. First commissioned in 2005, the 2007/2008 survey was the third in the series. In 2007/2008, questions about past year gambling participation were also included for adults aged 16 and over. In 2007/2008, 29,420 interviews with adults were obtained. Data is deposited in the UK data archive and full technical details are given in Williams, 2008.

Survey methodology

The survey methodology was similar to that of the BGPS. A random, stratified and clustered sample of addresses was drawn from the postcode address file. All issued addresses were visited by trained survey interviewers who attempted to make contact with the people living at the selected household. Where contact was made, all adults aged 16 and over were enumerated and a random selection of one adult per household made. The overall response rate was 58%. Data was collected using computer-assisted interviewing, meaning the interviewer asked the questions directly to the participant.

Use in this thesis

Taking Part data was used in Chapter 6 of this thesis to further explore the broader leisure and recreation repertoire of female gamblers. As noted in that chapter, this only included the types of 'formal' leisure, cultural and sporting activity asked about in the survey. Data about gambling only included participation in the past year and past week. This was used in an LCA analysis to identify different types of female gamblers and explore the extent to which they engaged with other forms of leisure activity. The large sample sizes meant that regression models could be developed to explore this and a number of other variables, such as area classification according to Acorn classification, provided new insight as these variables are not available on other datasets. However, because information was only gathered from one adult per household, the relationship between the individual and who else they lived with could not be explored. A copy of the 2007/2008 data with the final LCA types and new derived variables is available at dropbox (full link given at the end of this section).

Limitations

As noted above, the sampling method used in this survey precluded examination of intra-household relationships. However, it did contain more socio-economic variables than studies like the BGPS and so allowed issues relating to religion and area characteristics to be explored. The survey data was collected face to face, rather than via self-completion, which may, in part, explain the slightly lower gambling prevalence rates observed with this study compared with the BGPS. This is because some people may not have wished to admit to an interviewer that they bet or gamble. Given themes of shame noted in this thesis, this may be particularly pertinent for women. The types of leisure activity included in this survey are those which the government seeks to encourage and this study, therefore, represents a somewhat distorted view of broader leisure and recreation repertoires. Finally, as with the BGPS, only women living in private households were included in the survey, meaning those living in institutions are not represented.

Youth Gambling surveys

Overview

The youth gambling data presented in this thesis came from two sources. The first was the National Lottery Commission's (NLC) annual youth tracking survey. The second was the 2008/2009 British Survey of Children, the National Lottery and Gambling. The youth tracking surveys comprise of a suite of questions about youth gambling that is included in Ipsos MORI's youth omnibus survey. Data have been collected in 2011, 2012 and 2013. Information is collected using a self-completion booklet in a school based setting. The age ranges covered are those aged 11 to 16. In each survey year, around 2,500 children are interviewed. The British Survey of Children, the National Lottery and Gambling was also conducted by Ipsos MORI. It aimed to measure gambling participation and problem gambling among youth, using a similar methodology to the omnibus survey. Overall, 8893 children were interviewed in 2008/09.

Survey methodology

For the British Survey of Children, the National Lottery and Gambling, the survey methodology was as follows: a sample of secondary schools in England, Scotland and Wales was selected at random. Interviewers and researchers attempted to contact each school to gain co-operation. In co-operating schools, all classes in years 11 and 13 were enumerated and one selected at random. Finally all children within that class were eligible to take part. The response rate for schools was 22%, though the final response rate, incorporating non-response at the pupil level was not published. Data was collected via a self-completion questionnaire. Full details can be found in Ipsos MORI full study report (see Ipsos MORI, 2009). The youth tracking surveys follow the same methodology and in 2013 the study had a school response rate of 19%. (See Ipsos MORI, 2013).

Use in this thesis

None of the youth datasets are publicly available. Access to the 2009, 2012 and 2013 studies was secured through a request to the NLC. With regards to the youth

omnibus studies, numerous data requests were made to ensure that the same variables for each year were included in the datasets provided (this involved the NLC asking Ipsos MORI to compile the datasets to a standard specification that I developed). Access to the 2011 youth tracking data was also requested but the dataset was provided too late to be included in this thesis.

Data from the 2012 and 2013 youth tracking surveys were combined to boost base sizes. This included a process of checking, editing and cleaning both datasets to ensure they could be merged correctly and to deal with inconsistencies in coding. This dataset was used in Chapter 7 to explore youth gambling behaviour among girls. The combined data was also used to examine use of social media games. This was preferred over the 2008/09 data as this is a relatively recent phenomenon. The 2008/2009 data was also merged with the youth tracking data so that trends over time could be assessed. This is possible as the sampling methodology used in the two surveys is identical. Because this data is not publicly available, I have not included it within my data repository.

Limitations

There area number of limitations to bear in mind when using this data:

1) The youth tracking data only samples schools from the state sector. Those in private education are excluded. Therefore, this data does not represent all children. It may be speculated that those in private education may be more likely to gamble given (potentially) enhanced access to pocket money and resources (shown to be important in explaining youth gambling, Forrest & McHale, 2012) and due to structural situations (i.e., boarding schools potentially providing more opportunities for private betting and gaming within private social networks);

2) the response rate for these studies is low and therefore may also not be representative of youth, and;

3) although confidential self-completion methods were used, young people may mis-report their behaviour. Other school based studies of smoking, drinking and drug use have included placebo drugs within their questionnaires to estimate the level of mis-

reporting. This has consistently shown that a small proportion of children over estimate their drug use (Fuller, 2013).

Health Surveys for England and Scotland 2012

Overview

The Health Survey for England (HSE) is part of a programme of surveys currently commissioned by the Health and Social Care Information Centre, and before April 2005 commissioned by the Department of Health. The HSE is an annual survey that collects information about the health and health-related behaviours of the public in England and helps to ensure that policies are informed by these data. The survey also monitors progress towards selected health targets. The HSE 2012 was the 22nd in the series. All surveys in the series collected information from the adult population aged 16 and over living in private households in England. The survey gathers a wealth of information including socio-demographic variables and objective measures of health such as height, weight and blood pressure, plus modules of questions that vary annually. This means that it is possible to look at how people's health is related to their characteristics and circumstances.

The Scottish Health Survey (SHeS) 2012 was the eighth Scottish Health Survey and the fifth report published since the survey moved to a continuous design in 2008. The series is commissioned by the Scottish Government Health Directorates to provide regular information that cannot be obtained from other sources on a range of aspects concerning the public's health. The SHeS provides a detailed picture of the health of the Scottish population living in private households and is designed to make a major contribution to the monitoring of health in Scotland. It is essential for the Scottish Government's forward planning, for identifying gaps in health services provision and for identifying which groups are at particular risk of future ill-health.

In 2012, gambling questions were included in HSE and SHeS for the first time. These included past year gambling participation on a range of activities and problem gambling screening questionnaires. Findings from the combined 2012 HSE and SHeS

survey were published in 2014 (see Wardle et al, 2014). Full technical details of sample sizes and response rates can be found in that report.

Use in this thesis

The combined HSE and SHeS data was mainly used in Chapter 6 to explore further relationships between ethnicity, religion and gambling behaviour. Because these datasets only include a narrow range of data about gambling behaviour, the BGPS 2010 was used for more in depth analysis of female gambling groups. However, LCA was undertaken for women in the main combined HSE and SHes report (see Wardle et al, 2014). This method was replicated using the BGSP 2010 data and largely gave similar results. I would be happy to share this data, if interested.

Treatment data

Overview

The treatment data provided was based on entries by over 20 different treatment providers into a common SQL database from 2006 onwards. At the first session with clients, counsellors collected a range of demographic and background information. This ranged from demographic factors like age, sex, ethnicity to economic factors like employment as well as health and wellbeing and past gambling behaviour. This also included the administration of a problem gambling screen based on the DSM-IV criteria. Data were entered post-hoc into the SQL database for each client. However, the process of collecting this information was voluntary and clients could refuse to answer a question if they wished. In these circumstances, counsellors would not push for a response as this was the first meeting and it was more important to establish a trusting relationship with the client. Furthermore, different types of data were collected at different times and/or questions and response categories changed, meaning the consistencies and quality of the data over time is variable.

Methodology

An entity diagram showing the data structure was provided by the treatment organisation. This outlined how the SQL data tables were linked and structured.

Once the structure of the data was understood and the meaning of variables clarified (after various meetings with the treatment provider), relevant tables were extracted into flat file format. These were then exported into PASW (formerly SPSS). A significant data cleaning and management exercise was undertaken to clean, edit and match relevant data files together. This included creating new link identifiers based on the logic outlined by the treatment providers (the same unique identifier was not used in every table and therefore had to be recreated using the linking logic outlined by the database creator. This was checked and double checked with him). Because of the extent of the data management exercise, this process was only undertaken for table files to be used in analysis.

Use in this thesis

This data was used in Chapter 7 of this thesis. The intention was to use this data to explore how problem gambling varies among women presenting for treatment. Overall, 1192 women were present in the data who had a valid DSM-IV score. This represents 62% of all women in the dataset. The remaining women were asked different problem gambling screens and bases sizes were not large enough to include them in analysis. Data for other variables was of mixed quality and for some variables, like age, there were too few valid cases to warrant inclusion in the analysis. For the other variables used in Chapter 7, missing values ranged between 469 (marital status) and 0 (learning difficulties). Therefore, the analysis presented in Chapter 7 focuses more on cross tabulation, based on valid cases, rather than regression models where the number of missing values would have caused analytical problems. Because this data is not publicly available, it has not been included in my thesis data repository. However, I would be happy to talk further about the procedures undertaken when analysing this data.

Limitations

There are a number of limitations with this data. The first is data quality. The data are not consistent or complete and there may be some systematic biases in how different counsellors collected certain information. Secondly, the data structure

were complex and although every attempt was made to ensure that the SQL tables were linked accurately, the absence of an unique identifier in all tables opens the potential for error. Thirdly, this is data from a self-selecting sample and has associated attendant problems. However, analysis produced for this thesis does not purport to be representative of all women with gambling problems, it was simply used to explore how problem gambling behaviour varies among this cohort of women, despite the limitations noted.

Dropbox archive

As a resource for other researchers or for those interested in the data used in this thesis, I have deposited revised datasets and relevant syntax files in a dropbox archive. The link to access this is:

https://www.dropbox.com/sh/6nm1eq5ty4178a8/AADN-HoLWhIEh3mVJcefm1nia?dl=0

Alternatively, if people contact me at h.wardle.1@research.gla.ac.uk, I will e-mail the link to you.

The dropbox archive includes the following:

1) Datasets – this includes the combined BGPS 1999, 2007, 2010 dataset; the BGPS 2010 dataset and the Taking Part 2007/08 dataset. For each of these additional variables have been included, such as the cluster variables from the latent class analysis or other derived variables.

2) Syntax files for derived variables – these files show the checking, editing, merging and derivation process used to produce the final files listed at (1). Not all input files are available but other researchers can see how derivations have been made and the process undertaken.

3) Logistic regression models - for each chapter, the Stata do files which show the model building process have been uploaded.

Other data and files have not been uploaded because they are not publicly available and therefore cannot be shared at this stage (permission may be granted to access these but would require me to check with the data owners).

By creating this archive, it is hoped that a) the analytical and data management process undertaken for this thesis is more transparent and b) it is a useful resource for other researchers.

Appendix B: Tables

In the section that follows tables for analysis quoted in Chapters 5, 6 and 7 are shown. Tables are presented for each chapter separately and shown in the order in which they are included within each chapter.

Table conventions

The following conventions are used in all tables:

- 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 survey on which analysis is based is shown in the top right hand corner of each table. The following naming conventions have been used:

  - BGPS: British Gambling Prevalence Survey
  - YTS: Youth tracking surveys
  - YGS: Youth Gambling Survey 2009
  - Taking Part: Taking Part survey 2007/2008
  - Treatment data: Treatment data from problem gambling counsellors.

- The data used in this report have been weighted (with the exception of the treatment data). 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 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 (i.e., 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 thesis commentary.

Tables for Chapter 5

List of tables:

Table 5.1

Past year and past week gambling prevelance among women, by age and survey year

All women aged 16 and over BGPS

Gambling prevalence	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Past year gambling								
1999	62	75	76	75	71	60	48	68
2007	55	69	71	68	69	64	54	65
2010	66	69	73	74	78	69	62	71
Past week gambling								
1999	33	47	55	56	58	46	38	48
2007	22	32	38	43	44	42	36	37
2010	23	32	42	45	50	45	40	40
Bases *								
Weighted								
1999	*509*	*735*	*686*	*634*	*487*	*436*	*457*	*3955*
2007	*639*	*742*	*875*	*726*	*689*	*479*	*471*	*4636*
2010	*565*	*612*	*708*	*659*	*583*	*426*	*401*	*3955*
Unweighted								
1999	*481*	*735*	*788*	*720*	*540*	*442*	*353*	*4070*
2007	*526*	*724*	*902*	*782*	*820*	*523*	*440*	*4733*
2010	*525*	*608*	*779*	*729*	*659*	*521*	*356*	*4177*

* Bases shown are for past year prevalence, bases for past week prevalence in 2007 and 2010 are between 1-2 cases lower than those shown because of item non-response to survey questions.

Table 5.2

Past year and past week gambling prevelance, excluding National Lottery only gamblers, among women, by age and survey year

All women aged 16 and over BGPS

Gambling prevalence	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
Past year gambling (excluding National Lottery only)								
1999	49	50	47	40	37	31	24	41
2007	47	53	47	45	41	35	30	44
2010	57	57	55	52	55	46	48	53
Past week gambling (excluding National Lottery only)								
1999	19	19	21	19	21	19	16	19
2007	13	13	14	15	16	17	14	14
2010	15	14	17	14	18	17	19	16
Bases *								
Weighted								
1999	*509*	*735*	*686*	*634*	*487*	*436*	*457*	*3955*
2007	*639*	*742*	*875*	*726*	*689*	*479*	*471*	*4636*
2010	*565*	*612*	*708*	*659*	*583*	*426*	*401*	*3955*
Unweighted								
1999	*481*	*735*	*788*	*720*	*540*	*442*	*353*	*4070*
2007	*526*	*724*	*902*	*782*	*820*	*523*	*440*	*4733*
2010	*525*	*608*	*779*	*729*	*659*	*521*	*356*	*4177*

* Bases shown are for past year prevalence, bases for past week prevalence in 2007 and 2010 are between 1-2 cases lower than those shown because of item non-response to survey questions.

Table 5.3

Mean number of gambling activities and relative engagement ratios among women, by age and survey year

All women aged 16 and over   *BGPS*

Mean number of gambling activities	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
1999								
Mean	1.6	1.7	1.5	1.4	1.3	1.0	0.8	1.3
Standard error of mean	0.09	0.06	0.05	0.05	0.05	0.05	0.06	.027
2007								
Mean	1.5	1.8	1.5	1.5	1.3	1.1	0.9	1.4
Standard error of mean	0.09	0.08	0.05	0.07	0.05	0.06	0.05	.030
2010								
Mean	1.7	1.8	1.8	1.6	1.6	1.3	1.1	1.6
Standard error of mean	0.08	0.08	0.07	0.06	0.06	0.06	0.06	.028
Relative gambling engagement to availability ratios								
1999								
Mean	.13	.14	.12	.11	.11	.08	.06	.11
Standard error of mean	.007	.005	.004	.004	.004	.004	.005	.002
2007								
Mean	.09	.11	.09	.09	.08	.06	.05	.08
Standard error of mean	.005	.005	.003	.004	.003	.003	.003	.002
2010								
Mean	.09	.10	.10	.09	.09	.07	.06	.09
Standard error of mean	.005	.004	.004	.003	.003	.003	.003	.002
Bases								
Weighted								
1999	*509*	*735*	*686*	*634*	*487*	*436*	*457*	*3955*
2007	*639*	*742*	*875*	*726*	*689*	*479*	*471*	*4636*
2010	*565*	*612*	*708*	*659*	*583*	*426*	*401*	*3955*
Unweighted								
1999	*481*	*735*	*788*	*720*	*540*	*442*	*353*	*4070*
2007	*526*	*724*	*902*	*782*	*820*	*523*	*440*	*4733*
2010	*525*	*608*	*779*	*729*	*659*	*521*	*356*	*4177*

Table 5.4

Mean number of gambling days per year among women, by age and survey year

All women aged 16 and over   *BGPS*

Mean number of gambling days	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
2007								
Mean number of gambling days per year	26.4	34.9	41.0	43.7	50.3	52.8	40.2	40.9
Standard error of mean	2.80	2.24	2.65	2.73	2.49	7.81	3.27	1.36
2010								
Mean number of gambling days per year	43.7	46.1	53.8	55.6	55.8	51.1	45.1	50.6
Standard error of mean	4.66	3.13	3.11	3.15	3.60	3.58	3.85	1.46
Bases								
Weighted								
2007	*639*	*742*	*875*	*726*	*689*	*479*	*471*	*4636*
2010	*565*	*611*	*709*	*659*	*583*	*428*	*402*	*3957*
Unweighted								
2007	*526*	*724*	*902*	*782*	*820*	*523*	*440*	*4733*
2010	*525*	*607*	*780*	*729*	*659*	*523*	*357*	*4180*

Table 5.5

Frequency of gambling on most frequent activity among women, by age and survey year

All women aged 16 and over   *BGPS*

Gambling prevalence	Age group							Total
	16-24	25-34	35-44	45-54	55-64	65-74	75+	
	%	%	%	%	%	%	%	%
2007								
More than once a week	5	8	11	12	18	14	11	11
Once a week	11	16	22	28	26	29	25	22
Once a month or more but less than once a week	15	16	12	9	8	6	6	11
Few times per year	24	29	25	19	17	15	10	21
Did not gamble	45	31	29	32	31	36	47	35
2010								
More than once a week	7	10	12	16	16	17	15	13
Once a week	12	18	26	28	33	30	24	24
Once a month or more but less than once a week	15	15	13	11	10	9	11	12
Few times per year	33	25	22	19	19	14	12	21
Did not gamble	34	31	27	26	22	31	38	29
Bases								
Weighted								
2007	*638*	*742*	*873*	*725*	*687*	*478*	*467*	*4626*
2010	*565*	*611*	*708*	*659*	*583*	*426*	*401*	*3954*
Unweighted								
2007	*525*	*724*	*900*	*781*	*818*	*522*	*437*	*4723*
2010	*525*	*607*	*779*	*729*	*659*	*521*	*356*	*4176*

Table 5.6						

Age first gambled among women, by age cohort

All women aged 16 and over   *BGPS 2010*

Age first gambled	Age group					
	16-24	25-34	35-44	45-54	55-64	65+
	%	%	%	%	%	%
Below 14*	12	15	23	24	20	8
Below 15	16	16	25	27	22	11
Below 16	21	19	29	29	25	14
Below 17	50	39	37	37	31	17
Below 18	54	42	38	39	34	19
Below 19	66	57	51	51	44	26
Median age first gambled	16	18	18	18	20	30
Bases						
Weighted	*552*	*608*	*698*	*644*	*561*	*786*
Unweighted	*515*	*604*	*768*	*710*	*634*	*837*
* percentages are cumulative						

Table 5.7								

Age first gambled among women aged 40 or under, by 3 year age groups

All women aged between 16 and 39   *BGPS 2010*

Age first gambled	Age group							
	16-18	19-21	22-24	25-27	28-30	31-33	34-36	37-39
	%	%	%	%	%	%	%	%
Below 14*	15	12	10	9	13	16	20	24
Below 15	21	15	12	11	14	18	22	28
Below 16	28	19	17	13	19	21	25	31
Below 17	55	45	48	40	42	35	33	41
Below 18	61	49	51	44	44	38	35	43
Below 19	73	63	62	58	58	55	51	55
Median age first gambled	16	18	17	18	18	18	18	18
Bases								
Weighted	*187*	*154*	*174*	*182*	*174*	*179*	*216*	*243*
Unweighted	*198*	*171*	*183*	*180*	*175*	*183*	*201*	*217*
* percentages are cumulative								

Table 5.8			

Type of gambling (private, public, chance, strategy), by survey year

All women aged 16 and over   *BGPS*

Gambling group	Survey year		
	1999	2007	2010
	%	%	%
Private chance	46	34	37
Private strategy	2	1	2
Public chance	7	5	4
Public strategy	1	1	2
Private	47	35	38
Public	8	6	5
Chance	48	36	38
Strategy	3	3	3
Bases			
Weighted	*3955*	*4640*	*3954*
Unweighted	*4070*	*4735*	*4176*

Table 5.9			

Type of gambling (private, public, chance, strategy) among past week gamblers, by survey year

All female past week gamblers aged 16 and over   *BGPS*

Gambling group	Survey year		
	1999	2007	2010
	%	%	%
Private chance	96	93	95
Private strategy	3	4	4
Public chance	15	13	10
Public strategy	3	4	4
Private	97	95	96
Public	16	16	13
Chance	99	98	97
Strategy	6	7	8
Bases			
Weighted	*1903*	*1703*	*1564*
Unweighted	*1994*	*1798*	*1702*

Table 5.10

Mean DSM-IV scores (out of 30) among women, by age and survey year

All women aged 16 and over   *BGPS*

DSM-IV score	Age group			Total
	16-34	35-54	55+	
	%	%	%	%
1999				
Mean DSM-IV score	0.3	0.2	0.1	0.2
Standard error of mean	0.04	0.03	0.02	0.02
2007				
Mean DSM-IV score	0.3	0.2	0.1	0.2
Standard error of mean	0.03	0.02	0.02	0.02
2010				
Mean DSM-IV score	0.5	0.3	0.1	0.3
Standard error of mean	0.05	0.03	0.02	0.02
Bases				
Weighted				
1999	*1221*	*1294*	*1329*	*3853*
2007	*1296*	*1507*	*1532*	*4351*
2010	*1176*	*1368*	*1411*	*3956*
Unweighted				
1999	*1193*	*1477*	*1285*	*3965*
2007	*1173*	*1586*	*1667*	*4442*
2010	*1132*	*1509*	*1537*	*4178*

Tables for Chapter 6

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Table 6.1

Breadth and depth of gambling, by latent class group

All women aged 16 and over   *BGPS 2010*

Gambling participation	Latent class group						Total
	a	b	c	d	e	f	
	%	%	%	%	%	%	%
Number of activities engaged in							
0	100	0	0	0	0	0	29
1	0	74	59	27	16	1	27
2	0	26	29	30	31	9	20
3	0	0	10	28	24	15	11
4	0	0	2	11	15	22	6
5	0	0	0	4	8	19	3
6	0	0	0	1	4	15	2
Median number of activities	0	1	1	2	3	5	1
Number of gambling days							
0	100	0	0	0	0	0	29
1 to 12 days	0	100	0	42		0	21
More than 12 days to 35 day	0	0	0	58	1	0	7
More than 35 days to 58 days	0	0	100	0	6	0	15
More than 58 days to 106 days	0	0	0	0	46	1	12
More than 106 days	0	0	0	0	46	99	15
Median number of gambling days	0	3	52	15	104	284	12
*Bases**							
Weighted	*1155*	*626*	*539*	*476*	*1018*	*140*	*3955*
Unweighted	*1170*	*657*	*589*	*505*	*1107*	*149*	*4177*

* Bases shown are for number of activities undertaken, bases for number of gambling days vary between 1-2 cases dues to item non-response

Table 6.2

Gambling participation, by latent class group

All women aged 16 and over   *BGPS 2010*

Gambling prevalence	Latent class group						Total
	a	b	c	d	e	f	
	%	%	%	%	%	%	%
National Lottery	-	48	89	75	94	95	56
Scratchcards	-	14	15	36	53	83	25
Other lotteries	-	30	21	44	41	50	25
Football pools	-	0	0	1	3	10	1
Bingo (not online)	-	4	7	12	22	53	10
Slot machines	-	6	4	17	17	43	14
Machines in a bookmakers	-	-	0	2	2	12	1
Poker played in pubs or clubs	-	0	-	1	1	2	1
Casino table games (not online)	-	2	1	3	3	8	3
Horse races (not online)	-	9	8	20	18	42	16
Dog races (not online)	-	1	2	4	4	14	3
Sports and other events (not online)	-	1	1	4	7	27	5
Online betting with a bookmaker	-	0	-	0	1	3	0
Online gambling on slots, casino or bingo games	-	1	1	2	4	16	2
Spread-betting	-	0	0	-	-	5	
Private betting	-	7	5	12	11	18	10
*Bases**							
Weighted	*1157*	*1018*	*539*	*476*	*1018*	*140*	*3957*
Unweighted	*1172*	*1107*	*589*	*505*	*1107*	*149*	*4179*

* Bases shown are for participation in the National Lottery, individual bases for other activities vary.

Table 6.3a

Estimated odds ratios for belonging to Class A (non-gamblers)

All women aged 16 and over *BGPS 2010*

Socio-demographic and health characteristics	OR	95% CI	
		Lower	Upper
Number of other gamblers in household (p<0.001)			
0	1		
1	0.28	0.21	0.36
2	0.14	0.09	0.24
3 or more	0.06	0.03	0.12
Partial households	0.23	0.17	0.31
Single person households	0.37	0.28	0.48
Number of leisure activities undertaken (p>0.001)			
Number of activities	0.94	0.92	0.97
Ethnic group (p<0.001)			
White/White British	1		
Mixed	2.07	1.14	3.77
Asian/Asian British	2.94	1.95	4.43
Black/Black British	2.72	1.71	4.33
Other	1.80	0.90	3.62
Educational qualifications			
Professional qualification/degree or higher	1		
A-levels/O-levels or equivalent	0.73	0.60	0.88
Other/None	0.63	0.49	0.81
NS-SEC (p=0.01)			
Managerial & professional	1		
Intermediate	0.81	0.67	0.99
Routine & manual	0.76	0.62	0.93
Unknown	1.27	0.83	1.93
Economic activity (p<0.001)			
In employment, self-employed or government training	1		
Unemployed	2.44	1.00	5.95
Looking after family/home	1.62	1.27	2.06
Retired	1.50	1.17	1.91
Full time education	2.23	1.56	3.19
Other	1.26	0.86	1.84
Alcohol			
Did not drink in last 7 days	1		
Drank 1-4 units on heaviest drinking day	0.77	0.64	0.93
Drank 5-9 units on heaviest drinking day	0.73	0.56	0.96
Drank 10 units or more on heaviest drinking day	0.46	0.28	0.78
Cigarette smoking status (p<0.001)			
Non-smoker			
Current smoker	0.58	0.47	0.72

Table 6.3a (continued)			
Estimated odds ratios for belonging to Class A (non-gamblers)			
All women aged 16 and over			*BGPS 2010*
Socio-demographic and health characteristics	**OR**	**95% CI**	
		Lower	Upper
Number of adults in household (p<0.001)			
1-2	1		
3	1.61	1.19	2.17
4 or more	2.15	1.48	3.12
Parental gambling status (p<0.001)			
Parents did not gamble regularly	1		
Parent regularly gambled	0.76	0.63	0.92
Parents regularly gambled and had problem with gambling	0.69	0.45	1.05
Hosmer-Lemeshow Test: F-adjusted test statistic = 1.21; p=0.286[1]			

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[1] Because of the complex survey design, the Hosmer-Lemeshow test was calculated using the svylogitgof command in Stata which produces an adjusted F-test statistic rather than a chi squared statistics.

Table 6.3b

Estimated odds ratios for belonging to Class B (low depth and breadth gambler)

All women aged 16 and over   *BGPS 2010*

Socio-demographic and health characteristics	OR	95% CI	
		Lower	Upper
Age group (p<0.02)			
16-24	1		
25-34	0.73	0.52	1.04
35-44	0.65	0.45	0.92
45-54	0.64	0.42	0.96
55-64	0.39	0.23	0.65
75+	0.37	0.19	0.71
Number of leisure activities undertaken (p>0.02)			
Number of activities	1.04	1.01	1.07
Educational qualifications (p>0.001)			
Professional qualification/degree or higher	1		
A-levels/O-levels or equivalent	0.58	0.47	0.72
Other/None	0.57	0.43	0.75
Ethnicity (p=0.01)			
White/White British	1		
Mixed	0.31	0.11	0.82
Asian/Asian British	0.49	0.27	0.90
Black/Black British	0.50	0.26	0.96
Other	0.38	0.12	1.19
Economic activity (p<0.001)			
In employment, self-employed or government training	1		
Unemployed	0.35	0.12	0.99
Looking after family/home	0.95	0.72	1.25
Retired	1.50	0.98	2.28
Full time education	1.83	1.23	2.71
Other	1.40	0.92	2.11
Parental gambling status (p<0.01)			
Parents did not gamble regularly	1		
Parent regularly gambled	0.66	0.51	0.84
Parents regularly gambled and had problem with gambling	0.81	0.48	1.37
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.522; p=0.859			

Table 6.3c			
Estimated odds ratios for belonging to Class C (low breadth and medium depth gambler)			
All women aged 16 and over			*BGPS 2010*
		95% CI	
Socio-demographic and health characteristics	**OR**	Lower	Upper
Age group (p<0.001)			
16-24	1		
25-34	1.71	1.05	2.77
35-44	2.58	1.64	4.06
45-54	3.21	2.09	4.95
55-64	4.55	2.95	7.02
75+	4.25	2.70	6.70
Educational qualifications (p>0.01)			
Professional qualification/degree or higher	1		
A-levels/O-levels or equivalent	1.74	1.36	2.22
Other/None	1.47	1.11	1.94
Ethnicity (p=0.01)			
White/White British	1		
Mixed	0.80	0.27	2.37
Asian/Asian British	0.31	0.14	0.72
Black/Black British	0.23	0.08	0.65
Other	1.74	0.40	7.46
Hosmer-Lemeshow Test: F-adjusted test statistic = 1.22; p=0.283			

Table 6.3d

Estimated odds ratios for belonging to Class D (low depth and medium breadth gambler)

All women aged 16 and over   *BGPS 2010*

Socio-demographic and health characteristics	OR	95% CI	
		Lower	Upper
Age group (p<0.05)			
16-24	1		
25-34	0.77	0.53	1.12
35-44	0.67	0.46	0.97
45-54	0.64	0.45	0.91
55-64	0.53	0.36	0.80
75+	0.53	0.36	0.80
NS-SEC (p=0.01)			
Managerial & professional	1		
Intermediate	0.78	0.60	1.00
Routine & manual	0.56	0.43	0.72
Unknown	0.44	0.24	0.80
Number of other gamblers in household (p<0.01)			
0	1		
1	1.63	1.10	2.41
2	1.94	1.06	3.57
3 or more	3.72	1.81	7.65
Partial households	1.74	1.15	2.65
Single person households	1.24	0.82	1.88
Number of adults in household (p<0.01)			
1-2	1		
3	0.50	0.34	0.75
4 or more	0.57	0.35	0.94
Hosmer-Lemeshow Test: F-adjusted test statistic = 1.115; p=0.351			

Table 6.3e

Estimated odds ratios for belonging to Class E (medium breadth and depth gamblers)

All women aged 16 and over   *BGPS 2010*

Socio-demographic and health characteristics	OR	95% CI Lower	95% CI Upper
Number of other gamblers in household (p<0.001)			
0	1		
1	4.17	2.81	6.19
2	6.44	3.63	11.42
3 or more	7.58	3.69	15.57
Partial households	4.55	2.97	6.97
Single person households	3.37	2.25	5.06
Educational qualifications (p<0.01)			
Professional qualification/degree or higher	1		
A-levels/O-levels or equivalent	1.41	1.15	1.74
Other/None	1.49	1.17	1.89
NS-SEC (p<0.001)			
Managerial & professional	1		
Intermediate	1.34	1.10	1.64
Routine & manual	1.56	1.26	1.94
Unknown	0.85	0.53	1.36
Economic activity (p<0.001)			
In employment, self-employed or government training	1		
Unemployed	0.82	0.41	1.63
Looking after family/home	0.73	0.57	0.92
Retired	0.70	0.55	0.88
Full time education	0.37	0.25	0.56
Other	0.80	0.57	1.12
Cigarette smoking status (p<0.001)			
Non-smoker	1		
Current smoker	1.45	1.20	1.76
Number of adults in household (p<0.02)			
1-2	1		
3	0.72	0.54	0.95
4 or more	0.60	0.42	0.86
Parental gambling status (p<0.001)			
Parents did not gamble regularly	1		
Parent regularly gambled	1.44	1.20	1.72
Parents regularly gambled and had problem with gambling	1.53	1.06	2.22
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.520; p=0.860			

Table 6.3f

Estimated odds ratios for belonging to Class F (high breadth and depth gamblers)

		95% CI	
All women aged 16 and over			_BGPS 2010_
Socio-demographic and health characteristics	**OR**	Lower	Upper
Number of other gamblers in household (p<0.001)			
0	1		
1	2.92	1.06	8.03
2	7.83	2.52	24.32
3 or more	10.82	2.68	43.77
Partial households	4.68	1.59	13.79
Single person households	2.25	0.72	6.99
NS-SEC (p<0.001)			
Managerial & professional	1		
Intermediate	1.00	0.51	1.96
Routine & manual	2.23	1.33	3.73
Unknown	1.69	0.68	4.20
Cigarette smoking status (p<0.001)			
Non-smoker	1		
Current smoker	2.43	1.58	3.72
Parental gambling status (p<0.001)			
Parents did not gamble regularly	1		
Parent regularly gambled	1.75	1.15	2.68
Parents regularly gambled and had problem with gambling	2.46	1.14	5.32
Educational qualifications (p<0.01)			
Professional qualification/degree or higher	1		
A-levels/O-levels or equivalent	0.97	0.56	1.71
Other/None	1.82	1.00	3.31
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.697; p=0.711			

Table 6.4					
Gambling prevalence among men and women, by local area gambling venue excess risk ratios					
All aged 16 and over					*BGPS 2010*
Gambling behaviour	**Local area gambling venue excess risk ratio**				**Total**
	No gambling venues	Less than 1, more than 0 (lower than expected gambling venues)	More than 1, less than 1.89 (higher than expected gambling venues)	More than 1.89 (higher than expected gambling venues)	
	%	%	%	%	%
Men					
Past year gambling	76	76	70	79	75
Past week gambling	48	49	44	45	47
Monthly participation in certain gambling activities*					
Bingo	2	3	1	3	2
Fruit machines	6	7	6	10	7
Machines in a bookmakers	3	4	3	5	4
Bet on horses	6	6	6	7	6
Bet on dogs	2	3	2	3	2
Bet on sports	7	7	7	11	8
Bet on other events	3	2	3	3	3
Table games at a casino	1	2	2	4	2
All monthly gambling at a licensed premise	*16*	*18*	*15*	*24*	*18*
Women					
Past year gambling	71	71	65	73	71
Past week gambling	40	38	36	41	39
Monthly participation in certain gambling activities*					
Bingo	5	5	3	8	5
Fruit machines	2	3	2	3	2
Machines in a bookmakers	0	1	0	1	0
Bet on horses	1	1	0	1	1
Bet on dogs	0	0	0	0	0
Bet on sports	0	0	1	0	0
Bet on other events	1	1	1	1	1
Table games at a casino	0	0	0	0	0
All monthly gambling at a licensed premise	*8*	*9*	*7*	*11*	*8*
*Bases****					
Weighted					
Men	*1618*	*858*	*474*	*517*	*3467*
Women	*1742*	*914*	*468*	*477*	*3601*
Unweighted					
Men	*1535*	*793*	*439*	*458*	*3225*
Women	*1842*	*956*	*485*	*478*	*3761*

*These activities have been presented as these are land-based gambling conducted at licensed premises.
** Bases shown are for past year gambling activity. Bases for other items vary.

Table 6.5

Gambling participation, by Taking Part survey latent class group

All women aged 16 and over   *Taking Part*

Gambling participation	Latent class group						Total
	1	2	3	4	5	6	
	%	%	%	%	%	%	%
Number of activities engaged in							
0	100	-	-	-	3	-	41
1	-	100	1	0	82	-	38
2	-	-	99	0	15	100	13
3	-	-	-	64	-	-	5
4	-	-	-	25	-	-	2
5	-	-	-	7	-	-	1
6 or more	-	-	-	4	-	-	0
Gambling participation							
National Lottery	-	100	100	96	-	100	52
Other Lotteries	-	-	22	31	18	-	6
Scratchcards	-	-	-	62	24	100	10
Football Pools	-	-	3	7	2	-	1
Betting on horses races	-	-	35	50	27	-	9
Betting on dogs races	-	-	3	12	4	-	1
Betting on other events	-	-	1	8	2	-	1
Casino table games	-	-	2	8	3	-	1
Bingo tickets	-	-	27	47	19	-	7
Fruit/slot machines	-	-	5	28	9	-	3
Private betting	-	-	1	5	3	-	1
*Bases**							
Weighted	*5419*	*4191*	*1139*	*1041*	*931*	*503*	*13224*
Unweighted	*5908*	*4681*	*1272*	*1110*	*978*	*566*	*14515*

* Bases shown are for number of activities undertaken, bases for number of gambling days vary between 1-2 cases dues to item non-response

Table 6.6a

Estimated odds ratios for belonging to Taking Part survey Class 1 (non-gamblers)

All women aged 16 and over			*Taking Part*
		95% CI	
Socio-demographic, leisure and health characteristics	**OR**	Lower	Upper
Age group (p<0.001)			
16-19	1		
20-24	0.51	0.38	0.69
25-34	0.35	0.26	0.47
35-44	0.38	0.29	0.51
45-54	0.38	0.28	0.51
55-64	0.35	0.25	0.47
65-74	0.42	0.30	0.59
75-84	0.58	0.40	0.84
85+	1.07	0.71	1.62
Family structure (p<0.01)			
No children	1		
Lone parent	0.89	0.74	1.06
Parent with cohabiting partner	1.23	1.06	1.44
Acorn area classification (p<0.001)			
Wealthy achiever	1		
Urban prosperity	0.96	0.82	1.13
Comfortably off	0.74	0.66	0.83
Moderate means	0.75	0.65	0.88
Hard pressed	0.63	0.55	0.73
Unknown	0.17	0.04	0.65
Marital Status (p<0.001)			
Married	1		
Cohabiting with partner	0.87	0.74	1.03
Single	1.42	1.21	1.67
Widowed	1.26	1.08	1.48
Divorced	1.28	1.09	1.52
Separated	1.18	0.92	1.50
Ethnicity (p<0.001)			
White/White British	1		
Asian/Asian British	1.41	1.01	1.97
Black/Black British	1.78	1.39	2.28
Mixed/other	1.03	0.72	1.46
Religion (p<0.001)			
No religion	1		
Christian	0.83	0.74	0.93
Buddist	0.72	0.40	1.29
Hindu	1.04	0.60	1.81
Jewish	1.64	0.90	3.00
Muslim	3.08	2.00	4.77
Sikh	0.99	0.53	1.87
Don't know	0.99	0.74	1.33

Table 6.6a continued

Estimated odds ratios for belonging to Taking Part Survey class 1 (non-gamblers)

All women aged 16 and over   *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
NS-SEC of household reference person (p<0.001)			
Managerial & professional occupations	1		
Intermediate occupations	0.79	0.69	0.91
Lower supervisors occupations	0.79	0.67	0.94
Own accounts workers	0.66	0.55	0.78
Routine occupations	0.77	0.68	0.88
Not known	1.15	0.93	1.43
Economic activity (p<0.001)			
Paid work	1		
Unemployed	1.30	0.95	1.78
Full time education	1.15	0.85	1.56
Looking after family/home	1.41	1.19	1.66
Long-term sickness/disability	1.70	1.29	2.23
Retired	1.38	1.16	1.64
Educational qualifications (p<0.001)			
Degree or higher	1		
Higher than A-level but not degree level	0.80	0.68	0.95
A-level or equivalent	0.64	0.55	0.75
Trade apprenticeship	0.76	0.51	1.14
GCSE grades A-C or equivalent	0.57	0.49	0.67
GCSE grades D or below or equivalent	0.58	0.46	0.71
Other/mixed	0.54	0.42	0.70
None	0.49	0.42	0.59
Hours worked (p<0.001)			
Full time	1		
Part time	1.19	1.08	1.32
Unknown/non worker	1.39	1.09	1.76
Income (p<0.001)			
No income	1		
Lowest income (under £4,999 per year)	1.01	0.83	1.22
£5000-£14,999	0.89	0.74	1.07
£15,000-£24,999	0.75	0.61	0.93
£25,000-£34,999	0.71	0.55	0.91
£35,000-£44,999	0.87	0.65	1.17
£45,000 or more	1.15	0.85	1.56
Unknown	1.24	1.03	1.50
Smoking status (p<0.001)			
Current smoker	1		
Non-smoker	1.39	1.23	1.56
Health status (p<0.01)			
Very good	1		
Good	0.89	0.81	0.99
Fair	0.79	0.69	0.90
Bad	0.81	0.66	1.00
Very bad	0.69	0.48	0.99

Table 6.6a continued

Estimated odds ratios for belonging to Taking Part Survey class 1 (non-gamblers)

All women aged 16 and over   *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
Frequency of alcohol consumption per week (p<0.001)			
7 days per week	1		
4-6 days	0.82	0.66	1.02
1-3 days	0.84	0.71	1.00
Less often	0.86	0.73	1.03
Does not drink	1.23	1.03	1.47
Arts participation (p<0.01)			
Did not participate in any arts events	1		
Participated in 1 arts event	0.98	0.88	1.08
Participated in 2 or more arts events	1.17	1.04	1.31
Heritage site (p<0.01)			
Did not visit heritage site	1		
Visited heritage site	0.85	0.76	0.94
Museums (p<0.001)			
Did not visit museum	1		
Visited museum	1.30	1.18	1.43
Live sports events (p<0.001)			
Did not attend live sports event	1		
Attended live sports events	0.68	0.58	0.79
Hosmer-Lemeshow Test: F-adjusted test statistic = 1.04; p=0.405			

Table 6.6b

Estimated odds ratios for belonging to Taking Part survey Class 2 (National Lottery only)

Socio-demographic, leisure and health characteristics	OR	95% CI	
All women aged 16 and over		*Taking Part*	
		Lower	Upper
Age group (p<0.001)			
16-19	1		
20-24	1.35	0.92	1.97
25-34	2.78	1.97	3.94
35-44	3.29	2.33	4.63
45-54	3.91	2.77	5.53
55-64	4.37	3.07	6.22
65-74	3.50	2.40	5.12
75-84	3.01	2.03	4.48
85+	1.78	1.14	2.78
Acorn area classification (p<0.05)			
Wealthy achiever	1		
Urban prosperity	0.99	0.84	1.17
Comfortably off	1.16	1.03	1.30
Moderate means	0.98	0.85	1.14
Hard pressed	1.05	0.92	1.19
Unknown	2.81	1.08	7.29
Religion (p<0.001)			
No religion	1		
Muslim	1.09	0.97	1.21
Other	0.42	0.30	0.60
Unknown	1.00	0.75	1.32
Economic activity (p<0.001)			
Paid work	1		
Unemployed	0.82	0.60	1.12
Full time education	0.90	0.63	1.29
Looking after family/home	0.76	0.65	0.89
Long-term sickness/disability	0.64	0.50	0.81
Retired	0.82	0.69	0.96
Educational qualifications (p<0.001)			
Degree or higher	1		
Higher than A-level but not degree level	1.18	1.00	1.40
A-level or equivalent	1.41	1.21	1.64
Trade apprenticeship	1.39	0.92	2.10
GCSE or equivalent	1.34	1.16	1.54
Other/mixed	1.77	1.39	2.26
None	1.63	1.40	1.89
Hours worked (p<0.001)			
Full time	1		
Part time	0.87	0.80	0.95
Unknown/non worker	0.72	0.57	0.91

Table 6.6b continued

Estimated odds ratios for belonging to Taking Part survey Class 2 (National Lottery only)

All women aged 16 and over   *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
Cycled for recreation (p<0.01)			
No	1		
Yes	0.78	0.64	0.94
Walked for recreation (p<0.01)			
No	1		
Yes	1.15	1.05	1.26
Museums (p<0.01)			
Did not visit museum	1		
Visited museum	0.88	0.80	0.97
Arts participation (p<0.001)			
Did not participate any arts events	1		
Participated in 1 arts event	0.93	0.84	1.02
Participated in 2 or more arts events	0.74	0.66	0.83
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.38; p=0.943			

Female gambling behaviour: technical appendix

Table 6.6c

Estimated odds ratios for belonging to Taking Part survey Class 3 (Lottery and one other activity)

All women aged 16 and over   *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI Lower	95% CI Upper
Age group (p<0.001)			
16-19	1		
20-24	3.03	1.40	6.53
25-34	3.13	1.51	6.45
35-44	3.74	1.82	7.70
45-54	4.45	2.15	9.21
55-64	3.49	1.69	7.21
65-74	3.78	1.81	7.88
75-84	2.68	1.26	5.70
85+	1.06	0.41	2.73
Acorn area classification (p<0.01)			
Wealthy achiever	1		
Urban prosperity	1.11	0.83	1.50
Comfortably off	1.23	1.01	1.50
Moderate means	1.47	1.14	1.88
Hard pressed	1.58	1.27	1.96
Unknown	0.57	0.08	4.29
Ethnicity (p<0.01)			
White/White British	1		
Asian/Asian British	0.61	0.32	1.19
Black/Black British	0.45	0.27	0.77
Mixed/other	1.11	0.61	2.01
Religion (p<0.01)			
No religion	1		
Christian	1.14	0.95	1.37
Muslim	0.12	0.03	0.52
Other	0.38	0.15	0.96
Unknown	0.96	0.57	1.61
Educational qualifications (p<0.001)			
Degree or higher	1		
Higher than A-level but not degree level	1.20	0.90	1.60
A-level or equivalent	1.33	1.01	1.74
Trade apprenticeship	0.99	0.48	2.07
GCSE or equivalent	1.44	1.13	1.83
Other/mixed	1.53	1.03	2.27
None	1.90	1.48	2.44
Hours worked (p<0.01)			
Full time	1		
Part time	0.99	0.85	1.15
Unknown	0.39	0.22	0.71

Table 6.6c continued			
Estimated odds ratios for belonging to Taking Part survey Class 3 (Lottery and one other activity)			
All women aged 16 and over			*Taking Part*
Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
Income (p<0.01)			
No income	1		
Lowest income (under £4,999 per year)	0.76	0.54	1.06
£5000-£14,999	0.88	0.64	1.21
£15,000-£24,999	1.15	0.81	1.63
£25,000-£34,999	1.10	0.73	1.64
£35,000-£44,999	0.82	0.49	1.36
£45,000 or more	1.04	0.62	1.74
Unknown	0.69	0.50	0.97
Smoking status (p<0.05)			
Current smoker	1		
Non-smoker	0.82	0.69	0.97
Frequency of alcohol consumption per week (p<0.001)			
7 days per week	1		
4-6 days	0.98	0.69	1.37
1-3 days	1.16	0.89	1.52
Less often	0.96	0.73	1.26
Does not drink	0.68	0.51	0.91
Cycles for recreation (p<0.05)			
No	1		
Yes	0.72	0.53	0.98
Happiness			
Happiness score	1.05	1.01	1.09
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.47; p=0.895			

Table 6.6d			
Estimated odds ratios for belonging to Taking Part survey Class 4 (multiple interest gambler)			

All women aged 16 and over   *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
Age group (p<0.001)			
16-19	1		
20-24	1.98	1.19	3.31
25-34	2.57	1.56	4.22
35-44	1.69	1.02	2.79
45-54	1.40	0.83	2.36
55-64	1.69	0.99	2.90
65-74	1.69	0.91	3.11
75-84	0.96	0.44	2.10
85+	0.65	0.25	1.70
Acorn area classification (p<0.001)			
Wealthy achiever	1		
Urban prosperity	0.82	0.58	1.17
Comfortably off	1.35	1.08	1.69
Moderate means	1.53	1.17	2.00
Hard pressed	1.65	1.27	2.13
Unknown	0.22	0.03	1.79
Marital Status (p<0.01)			
Married	1		
Cohabiting with partner	1.62	1.28	2.06
Single	1.10	0.86	1.40
Widowed	0.91	0.64	1.28
Divorced	0.95	0.70	1.29
Separated	1.18	0.79	1.77
Ethnicity (p<0.001)			
White/White British	1		
Asian/Asian British	0.68	0.37	1.25
Black/Black British	0.10	0.04	0.24
Mixed/other	0.63	0.33	1.23
Religion (p<0.001)			
No religion	1		
Christian	1.34	1.12	1.61
Muslim	0.29	0.09	0.97
Other	0.47	0.22	1.01
Unknown	1.11	0.64	1.91
NS-SEC of household reference person (p<0.05)			
Managerial & professional occupations	1		
Intermediate occupations	1.21	0.94	1.56
Lower supervisors occupations	1.00	0.74	1.35
Own accounts workers	1.54	1.17	2.01
Routine occupations	1.26	1.00	1.59
Not known	1.07	0.72	1.59

Table 6.6d continued

Estimated odds ratios for belonging to Taking Part survey Class 4 (multiple interest gambler)

All women aged 16 and over   *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
Economic activity (p<0.01)			
Paid work	1		
Unemployed	0.97	0.62	1.53
Full time education	0.56	0.31	1.00
Looking after family/home	1.01	0.79	1.30
Long-term sickness/disability	0.45	0.28	0.73
Retired	0.68	0.49	0.96
Educational qualifications (p<0.001)			
Degree or higher	1		
Higher than A-level but not degree level	1.19	0.88	1.62
A-level or equivalent	1.32	1.00	1.74
Trade apprenticeship	1.84	0.89	3.81
GCSE or equivalent	1.90	1.47	2.45
Other/mixed	1.05	0.63	1.73
None	1.36	1.01	1.83
Income (p<0.001)			
No income	1		
Lowest income	1.02	0.71	1.46
2	1.24	0.89	1.74
3	1.22	0.84	1.77
4	1.78	1.18	2.70
5	1.24	0.69	2.23
Highest income	1.10	0.61	1.99
Unknown	0.57	0.39	0.84
Smoking status (p<0.001)			
Current smoker	1		
Non-smoker	0.69	0.58	0.83
Health status (p<0.001)			
Very good	1		
Good	1.26	1.05	1.52
Fair	1.35	1.07	1.72
Bad	2.36	1.63	3.42
Very bad	2.08	1.09	3.97
Frequency of alcohol consumption per week (p<0.001)			
7 days per week	1		
4-6 days	1.18	0.81	1.72
1-3 days	1.16	0.86	1.57
Less often	0.94	0.69	1.28
Does not drink	0.66	0.46	0.93

Table 6.6d continued

Estimated odds ratios for belonging to Taking Part Survey class 4 (multiple interest gambler)

All women aged 16 and over   *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
Arts attendance/participation (p<0.05)			
Did not attend/participate in any arts events	1		
Attended/participated in 1 or more arts events	1.21	1.02	1.43
Heritage site (p<0.05)			
Did not visit heritage site	1		
Visited heritage site	1.24	1.03	1.50
Live sports events (p<0.001)			
Did not attend live sports event	1		
Attended live sports events	1.57	1.27	1.95
Walked for recreation (p<0.001)			
No	1		
Yes	0.74	0.63	0.87
Participated in any sport in past four weeks (p<0.001)			
No	1		
Yes	1.24	1.06	1.45
Hosmer-Lemeshow Test: F-adjusted test statistic = 1.217; p=0.279			

Table 6.6e

Estimated odds ratios for belonging to Taking Part survey Class 5 (minimal interest, not lottery gambler)

All women aged 16 and over *Taking Part*

Socio-demographic, leisure and health characteristics	OR	95% CI	
		Lower	Upper
Age group (p<0.001)			
16-19	1		
20-24	1.12	0.76	1.66
25-34	0.72	0.50	1.03
35-44	0.46	0.32	0.67
45-54	0.40	0.27	0.59
55-64	0.37	0.24	0.56
65-74	0.36	0.21	0.62
75-84	0.46	0.25	0.83
85+	0.50	0.26	0.97
Ethnicity (p<0.05)			
White/White British	1		
Asian/Asian British	0.54	0.29	1.03
Black/Black British	0.47	0.25	0.91
Mixed/other	0.76	0.39	1.50
Economic activity (p<0.01)			
Paid work	1		
Unemployed	0.85	0.48	1.50
Full time education	0.87	0.56	1.36
Looking after family/home	0.81	0.62	1.07
Long-term sickness/disability	1.71	1.16	2.51
Retired	1.46	0.97	2.22
Smoking status (p<0.001)			
Current smoker	1		
Non-smoker	0.78	0.64	0.94
Frequency of alcohol consumption per week (p<0.05)			
7 days per week	1		
4-6 days	1.44	0.97	2.13
1-3 days	0.95	0.69	1.32
Less often	1.16	0.85	1.60
Does not drink	0.97	0.69	1.37
Sports participation in past four weeks (p<0.01)			
Did not do any sports	1		
Engaged in sports	1.22	1.03	1.44
Arts participation (p<0.05)			
Did not participate in any arts events	1		
Participated in 1 arts events	1.36	1.12	1.64
Participated in 2 or more arts events	1.36	1.12	1.65
Live sports events (p<0.001)			
Did not attend live sports event	1		
Attended live sports events	1.36	1.06	1.75
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.827; p=0.591			

Table 6.6f			
Estimated odds ratios for belonging to Taking Part survey Class 6 (lotteries and scratchcard gambler)			

All women aged 16 and over			_Taking Part_
Socio-demographic, leisure and health characteristics	**OR**	**95% CI**	
		Lower	Upper
Age group (p<0.001)			
16-19	1		
20-24	2.02	1.11	3.69
25-34	1.76	1.01	3.08
35-44	1.41	0.81	2.45
45-54	0.88	0.49	1.56
55-64	1.12	0.64	1.95
65-74	0.76	0.41	1.38
75-84	0.43	0.21	0.88
85+	0.37	0.14	0.93
Ethnicity (p<0.05)			
White/White British	1		
Asian/Asian British	0.48	0.29	0.82
Black/Black British	1.27	0.72	2.23
Mixed/other	1.02	0.52	1.98
Educational qualifications (p<0.01)			
Degree or higher	1		
Higher than A-level but not degree level	1.22	0.80	1.87
A-level or equivalent	1.52	1.04	2.24
Trade apprenticeship	2.51	1.03	6.13
GCSE or equivalent	1.82	1.28	2.60
Other/mixed	0.99	0.51	1.92
None	1.93	1.30	2.85
Income (p<0.05)			
No income	1		
Lowest income (under £4,999 per year)	1.26	0.78	2.05
£5000-£14,999	1.15	0.73	1.80
£15,000-£24,999	1.94	1.19	3.15
£25,000-£34,999	1.71	0.93	3.15
£35,000-£44,999	1.82	0.92	3.60
£45,000 or more	1.16	0.53	2.55
Unknown	1.05	0.64	1.71
Acorn area classification (p<0.05)			
Wealthy achiever	1		
Urban prosperity	0.93	0.59	1.47
Comfortably off	1.33	0.97	1.80
Moderate means	1.62	1.13	2.32
Hard pressed	1.49	1.05	2.12
Area type (p<0.05)			
Urban	1		
Rural	1.30	1.01	1.69
Museums (p<0.01)			
Did not visit museum	1		
Visited museum	0.73	0.58	0.91

Table 6.6f cont…			
Estimated odds ratios for belonging to Taking Part survey Class 6 (lotteries and scratchcard gambler)			
All women aged 16 and over			*Taking Part*
Socio-demographic, leisure and health characteristics	**OR**	**95% CI**	
		Lower	Upper
Health status (p<0.05)			
Very good	1		
Good	1.41	1.09	1.82
Fair	1.71	1.28	2.29
Bad	1.25	0.78	2.01
Very bad	2.27	1.10	4.67
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.818; p=0.599			

Tables for Chapter 7

List of tables:

Table 7.1

Past week gambling participation among youth, by survey year and age

All girls aged 12-15   *YTS; YGS*

Past week gambling participation	Age				Total
	12	13	14	15	
	%	%	%	%	%
2009	13	14	12	15	13
2012	15	12	9	10	12
2013	9	10	11	10	10
Bases					
Weighted					
2009	*1354*	*837*	*1505*	*543*	*4239*
2012	*269*	*229*	*226*	*227*	*950*
2013	*239*	*243*	*249*	*217*	*948*
Unweighted					
2009	*1367*	*865*	*1532*	*545*	*4309*
2012	*298*	*291*	*289*	*233*	*1111*
2013	*241*	*242*	*285*	*243*	*1011*

Table 7.2

Participation in gambling and social media gambling, by sex

All aged 12-15   *YTS 2012*

Gambling and social media gambling	Age		Total
	Boys	Girls	
	%	%	%
Neither gambled or played social media gambling games in past week	68	85	77
Gambled for money only in the past week	16	9	13
Played social media gambling games in past week	8	3	5
Both gambled and played social media gambling games in past week	8	3	5
Bases			
Weighted	*1225*	*1251*	*2486*
Unweighted	*1169*	*1309*	*2488*

Table 7.3

Past week participation in gambling activities, by age

All girls aged 12-15   *YTS 2012*

Past week gambling participation	Age				Total
	12	13	14	15	
	%	%	%	%	%
Tickets for the Lottery (Lotto)	5	1	1	4	3
Scratchcards	3	1	2	2	2
Lottery tickets online	1		1		1
Other lottery tickets (i.e. thunderball)	-	-	1	1	1
Fruit/slot machines	4	5	3	1	3
Betting in a bookmakers	-	-	-	-	-
Bingo at a bingo club	-	-	-	-	-
Table games in a casino	1	-	1	-	1
Private betting	2	3	2	3	3
Private gaming	4	5	5	2	4
Online gambling	1	1	1	1	1
Health lottery	2	1	1	1	1
Other machines	1	1	2	1	1
Other gambling	1	1	1	-	1
*Bases**					
Weighted	*269*	*229*	*226*	*227*	*950*
Unweighted	*298*	*291*	*289*	*233*	*1111*

*Bases shown are for Lotto tickets. Bases for other activities vary.

Table 7.4

Past week participation in gambling activities, by latent class group

All girls aged 11-16   *YTS 2012/13*

Past week gambling activities	Latent class group				Total
	A (non gamblers)	B (betting & machines players)	C (lottery players)	D (multiple interest)	
	%	%	%	%	%
Tickets for the Lottery (Lotto)	-	-	88	[54]	3
Scratchcards	-	18	26	[34]	3
Lottery tickets online	-	2	1	[18]	0
Other lottery tickets (i.e. thunderball)	-	-	17	[13]	1
Fruit/slot machines	-	28	6	[83]	4
Fixed odd betting terminals	-	4	-	[15]	0
Betting in a bookmakers	-	1	-	[16]	0
Bingo at a bingo club	-	11	3	[64]	2
Table games in a casino	-	2	-	[9]	0
Private betting	-	23	-	[43]	2
Private gaming	-	31	-	[70]	3
Online gambling	-	4	-	[29]	1
Health lottery	-	-	15	[23]	1
Other machines	-	5	3	[38]	1
Other gambling	-	6	-	[30]	1
Number of gambling activities					
0	100	-	-	-	88
1	-	73	57	-	7
2	-	23	27	-	3
3	-	4	15	[7]	1
4	-	-	-	[52]	1
5 or more	-	-	-	[41]	1
*Bases**					
Weighted	*2224*	*210*	*57*	*34*	*2524*
Unweighted	*2332*	*229*	*54*	*30*	*2645*

*Bases shown are for Lotto tickets. Bases for other activities vary.

Table 7.5

Socio-demographic and economic characteristics, by latent class group

All girls aged 11-16   *YTS 2012/2013*

Socio-demographic and economic characteristics	Latent class group			
	A (non gamblers	B (betting & machines players)	C (lottery players)	D (multiple interest)
	%	%	%	%
School year				
Year 7	25	26	34	32
Year 8	19	19	15	19
Year 9	21	16	6	30
Year 10	18	15	21	9
Year 11	18	24	24	10
Area type				
Rural	86	92	90	85
Urban	14	8	10	15
Family Affluence				
High	48	46	48	48
Medium	37	37	45	45
Low	14	17	7	7
Parental work status				
Two parents work	59	54	57	56
One parent works	31	30	29	26
Neither parent works	10	16	15	18
Ethnic origin				
White/White British	79	77	76	76
Other ethnic group	21	23	24	24
Siblings				
Only child	17	23	25	18
Has siblings	83	77	75	82
Academic progress				
Doing very well/quite well	93	87	88	83
Not doing very well/not at all well	7	13	12	17
Parental attitudes to gambling				
Parents did not facilitate gambling	70	51	26	34
Parents facilitate gambling	30	49	74	66
Household composition				
Single parent household	23	32	24	27
Non-single parent household	77	68	76	73
*Bases**				
Weighted	*2317*	*210*	*57*	*34*
Unweighted	*2425*	*229*	*54*	*30*

*Bases shown are for school year. Bases for other items vary.

Table 7.6a

Estimated odds ratios for belonging to Class A (non-gambler)

All girls aged 11-16 *YTS 2012/ 2013*

Socio-demographic/economic characteristics	OR	95% CI	
		Lower	Upper
Siblings (p<0.05)			
Only child	1		
Has siblings	1.43	1.03	1.98
Academic progress (p<0.001)			
Doing very well/quite well	0.53	0.35	0.79
Not doing very well/not at all well	0.45	0.25	0.79
Parental attitudes to gambling (p<0.001)			
Parents did not facilitate gambling	1		
Parents facilitate gambling	0.32	0.25	0.42
Parental work status (p<0.01)			
Two parents work	1		
One parent works	0.96	0.71	1.29
Neither parent works	0.57	0.39	0.83
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.695; p=654.			

Table 7.6b

Estimated odds ratios for belonging to Class B (betting and machines)

All girls aged 11-16 *YTS 2012/2013*

Socio-demographic/economic characteristics	OR	95% CI	
		Lower	Upper
Area type (p<0.001)			
Urban	1		
Rural	0.53	0.33	0.85
Academic progress (p<0.001)			
Doing very well/quite well	1		
Not doing very well/not at all well	1.84	1.17	2.90
Unknown	2.03	1.07	3.83
Parental attitudes to gambling (p<0.001)			
Parents did not facilitate gambling	1		
Parents facilitate gambling	2.12	1.57	2.87
Household composition (p<0.05)			
Non-single parent household	1		
Single parent household	1.45	1.05	2.02
Hosmer-Lemeshow Test: F-adjusted test statistic = 0.431; p=0.827.			

Table 7.6c

Estimated odds ratios for belonging to Class C (lotteries)

All girls aged 11-16 *YTS 2012/ 2013*

Socio-demographic/economic characteristics	OR	95% CI Lower	95% CI Upper
Age group (p<0.001)			
11-12	1		
13-4	0.29	0.14	0.61
15-16	1.07	0.55	2.10
Parental attitudes to gambling (p<0.001)			
Parents did not facilitate gambling	1		
Parents facilitate gambling	6.06	3.09	11.90

Hosmer-Lemeshow Test: F-adjusted test statistic = 3.77; p=0.002. The poor goodness of fit will be related to the very small number of girls in this group and low sample sizes. Appropriate caution has been highlighted in the thesis.

Table 7.6d

Estimated odds ratios for belonging to Class D (multiple interest)

All girls aged 11-16 *YTS 2012/2013*

Socio-demographic/economic characteristics	OR	95% CI Lower	95% CI Upper
Parental attitudes to gambling (p<0.05)			
Parents did not facilitate gambling	1		
Parents facilitate gambling	4.09	1.84	9.06

Hosmer-Lemeshow Test: F-adjusted test statistic = 0.000; p=1.00. The poor goodness of fit will be related to the very small number of girls in this group and low sample sizes. Appropriate caution has been highlighted in the thesis.

Table 7.7

DSM-IV item endorsement among treatment seekers, by sex

All treatment seekers completing the DSM-IV

DSM-IV items	Sex		_Treatment data_
	Women	Men	**Total**
	%	%	%
Preoccupied with gambling	76	81	80
Need to gamble with increasing amounts of money to get same excitement	68	71	71
Made unsuccessful attempt to stop gambling	75	79	79
Restless or irritable when attempting to stop gambling	62	62	62
Gambled as a way of escape	80	71	72
Chased losses	81	88	87
Lied to family and friends about extent of gambling	79	84	83
Committed an illegal act to fund gambling	18	23	22
Risked job or relationship or opportunity because of gambling	47	66	63
Relied on others for money	63	67	66
DSM-IV score			
0	7	2	3
1	1	1	1
2	1	1	1
3	3	3	3
4	5	5	5
5	9	9	9
6	16	15	15
7	19	19	19
8	18	20	20
9	15	18	17
10	6	7	7
Bases			
Unweighted	_1192_	_7937_	_9129_

Table 7.8			

DSM-IV item endorsement among treatment seekers, by latent class group

All female treatment seekers completing the DSM-IV

Treatment data

DSM-IV items	Latent class group		
	1	2	3
	%	%	%
Preoccupied with gambling	99	58	3
Need to gamble with increasing amounts of money to get same excitement	90	52	-
Made unsuccessful attempt to stop gambling	94	64	3
Restless or irritable when attempting to stop gambling	90	37	1
Gambled as a way of escape	92	80	1
Chased losses	97	76	-
Lied to family and friends about extent of gambling	96	72	1
Committed an illegal act to fund gambling	26	10	-
Risked job or relationship or opportunity because of gambling	62	37	-
Relied on others for money	82	50	-
Bases			
Unweighted	*625*	*478*	*89*

Table 7.9

Socio-demographic and economic characteristics, by latent class group

All female treatment seekers completing the DSM-IV

Treatment data

Characteristics	Latent class group		
	1	2	3
	%	%	%
Ethnicity			
White	92	91	94
Asian	3	3	6
Black	3	3	-
Mixed/other	2	4	-
Learning difficulties			
Aspergers	-	1	-
Moderate learning difficulty	6	5	2
Severe learning difficulty	0	1	2
Other	2	1	3
None	0	1	2
Disability			
Disability affecting mobility	7	9	5
Emotional/behavioural difficulties	5	3	2
Disability affecting hearing	3	1	-
Other	3	4	2
None	83	83	92
Mental health			
Diagnosed mental health problem	35	23	13
Undiagnosed mental health problem	7	3	3
None	58	74	84
Length of time gambling			
Less than five years	46	47	69
6-10 years	25	22	15
11-15 years	9	10	-
16-20 years	9	8	8
21 years or more	10	13	8
Number of children			
0	19	24	11
1	27	23	22
2	26	32	43
3	17	12	19
4 or more	11	8	5
Tenure			
Home owner	40	44	59
Hostel/shelter/b&b	1	1	0
Social housing	20	21	19
Private tenant	28	24	13
Living with family	3	3	2
Other	8	9	8
Employment			
Full time	29	34	30
Part time	21	19	28
Retired	7	9	10
Self employed	3	5	8
Student	2	2	8
Unemployed	28	25	10
Carer	6	2	5

Table 7.9 cont…

Socio-demographic and economic characteristics, by latent class group

All female treatment seekers completing the DSM-IV   *Treatment data*

Characteristics	Latent class group		
	1	2	3
Other	4	5	3
Debt			
Under 6k	34	31	30
6k-10k	16	16	8
11k-20k	12	11	3
21k-50k	12	9	16
50k or more	5	4	-
Amount unspecified	5	5	-
None	15	24	43
*Bases**			
Unweighted	*532*	*427*	*77*

*Bases shown are for ethnicity. Bases for each characteristic vary.

Table 7.10

DSM-IV factor scores, by socio-demographic and economic characteristics

All female treatment seekers completing the DSM-IV   *Treatment data*

Characteristics	Mean factor scores			
	Mean score for factor 1	Standard error	Mean score for factor 2	Standard error
Ethnicity				
White/White British	.74	.010	.43	.014
Not White/White British	.74	.024	.44	.033
Unknown	.77	.062	.43	.014
Learning difficulties				
Has learning difficulty	.73	.040	.46	.045
No learning difficulty	.74	.012	.43	.014
Unknown	.76	.034	.42	.014
Disability				
Has disability	.76	.025	.42	.028
No disability	.74	.010	.43	.014
Unknown	.75	.039	.42	.013
Mental health				
Diagnosed mental health problem	.80	.015	.48	.021
Undiagnosed mental health problem	.84	.032	.49	.042
None	.71	.015	.40	.016
Unknown	.75	.034	.44	.020
Length of time gambling				
Less than five years	.78	.017	.43	.019
6-10 years	.82	.019	.46	.021
11-15 years	.81	.027	.48	.041
16-20 years	.82	.030	.50	.045
21 years or more	.78	.032	.40	.041
Unknown	.70	.027	.41	.024
Number of children				
0	.76	.022	.39	.032
1	.76	.035	.47	.033
2	.72	.024	.37	.023
3	.77	.037	.39	.039
4 or more	.81	.034	.53	.039
Tenure				
Home owner	.72	.016	.39	.019
Social housing	.75	.016	.44	.020
Private tenant	.79	.013	.48	.021
Other	.77	.022	.48	.028
Unknown	.72	.078	.39	.025
Employment				
Full time	.74	.025	.42	.025
Part time	.74	.025	.40	.026
Unemployed	.78	.019	.50	.027
Other	.74	.023	.38	.028
Unknown	.74	.018	.43	.017
Debt				
Under 6k	.77	.018	.44	.022
6k-10k	.80	.017	.46	.030
11k or more	.80	.018	.51	.023
Amount unspecified	.83	.031	.33	.021
None	.70	.020	.51	.053

Appendix C: Analytical detail

General

Presentation of results
The commentary in this thesis highlights differences that are statistically significant at the 95% level. This means that there is a 5 in 100 chance that the variation seen is simply due to random chance. It should be noted that statistical significance is not intended to imply substantive importance.

Statistical packages and computing confidence intervals
All survey data are estimates of the true proportion of the population sampled. With random sampling, it is possible to estimate the margin of error either side of each percentage, indicating a range within which the true value will fall.

These margins of error vary according to different features of a survey, including the percentage of the estimate for the sampled population, the number of people included in the sample, and the sample design.

Survey data are typically characterised by two principal design features: unequal probability of selection requiring sample weights, and sampling within clusters. Both of these features have been considered when presenting the survey results. Firstly, non-response weights have been applied to analysis to minimise response bias. Secondly, results have been analysed using the complex survey module in PASW v18 (formerly SPSS) and the survey module in Stata, which can account for the variability introduced through the use of a complex, clustered, survey design. This procedure produces a Wald's F test as the default test of significance. Hence this was the test of statistical significance used in this thesis. All data presented is weighted for non-response, with the exception of the treatment data which represents a census of all those presenting for treatment. Latent class analyses were produced using Latent Gold 4.5 and geographic analysis produced using GeoDa.

Logistic regression procedure

For all models presented in this report, stepwise logistic regression was used to identify significant predictors of different gambling behaviours (i.e. predicting LCA class membership, etc). For each model, class membership was the binary dependent variable (1: belonging to the cluster, 0: not belonging to the cluster).

Missing values were recoded to the mode for each variable, except for variables such as NS-SEC of household reference person or income where they were included as a separate category (denoted as unknown in the tables).

All analyses were performed in Stata (a statistical analysis package) within the survey module (svy) which takes into account the complex sample and weighting structure of the surveys. Because stepwise regression is not available in Stata's survey module, the stepwise procedure for each model considered was simulated using the following steps:

A. A forward stepwise logistic regression with all independent variables was initially run outside the svy module (i.e. using the 'sw' command).

B. The variables identified as significant (at the 95% significance level) were then included in a 'svy logit' regression to test whether they remained significant.

C. If one variable was found to be not significant (if its p-value was greater than 0.05), it was removed from the model, and the model with the remaining variables was re-run and re-checked.

D. If more than one variable were found to be not significant, the one with the largest p-value was removed and the model with the remaining variables was re-run and re-checked.

E. When no more variables could be removed (because their p-value was less than 0.05), all other variables not in the model were added one-by-one (i.e. separate 'svy logit' models were run – as many as the remaining variables – with the existing variables plus one of the remaining ones at a time).

F. If none of the additional variables were significant, the procedure stopped and the initial model from step E was the final model.

G. If one of the additional variables was significant, then the variables already in the model were checked for removal. Variables were removed one at a time (the variable with the largest p-value was removed first), until no more variables could be removed.

H. If more than one additional variable was significant, the one with the smallest p-value entered the model and the remaining variables were checked for removal in the same way as in step G. The remaining significant variables were then entered, one at a time, based on their p-value (variables with the smallest p-value taking precedence) and after each entry the model was re-checked for variable removals.

I. If at this step the current model was different from the one at step E, the algorithm continued and steps E to H were repeated. The procedure stopped when there were no changes to the model (in terms of the significant variables included) between iterations.

Latent class analysis procedure

A key question in exploratory latent class analysis (LCA) is how many classes the sample should be divided into. However, there is no definitive method of determining the optimal number of classes. Because models with different numbers of latent classes are not nested, this precludes the use of a difference likelihood-ratio test.

For each LCA produced the following five ways were used to check results and decide on the optimal solution:

(a) Looking at measures of fit such as Akaike's Information Criterion (AIC and AIC3) and the Bayesian Information Criterion (BIC). In comparing different models with the same set of data, models with lower values of these information criteria are preferred.

(b) Looking at the misclassification rate. The expected misclassification error for a cluster solution is computed by cross-classifying the modal classes by the actual probabilistic classes. The sum of cases in the diagonal of this cross-classification corresponds to the number of correct classifications achieved by the modal assignment of cluster probabilities. The following formula is then applied: error=100*correct classifications/all cases. Models with lower misclassification rates are preferred.

(c) Looking at the percentage of cases in each cluster with a low probability of cluster membership. The vast majority of cases in a cluster should exhibit a high probability of belonging to the cluster, typically above 0.6.

(d) The resulting classes should be stable. For example, when moving from a six to a seven cluster solution, one of the clusters from the six-cluster solution should split to form two clusters in the seven-cluster option with the other clusters remaining largely unchanged. Cluster stability is investigated by cross-classifying successive cluster solutions.

(e) The resulting classes have to be interpretable. For the purposes of this analysis the main importance in deciding the number of classes was placed on interpretability.

The following tables and charts show checks (a) to (d) for each LCA.

British Gambling Prevalence Survey latent class analysis: depth and breadth analysis

Variables entered into Latent Gold:

- Total number of gambling days per year (continuous)

- Whether a past year gamblers (nominal)

- Total number of gambling activities (continuous)

Figure A1

Measures of fit
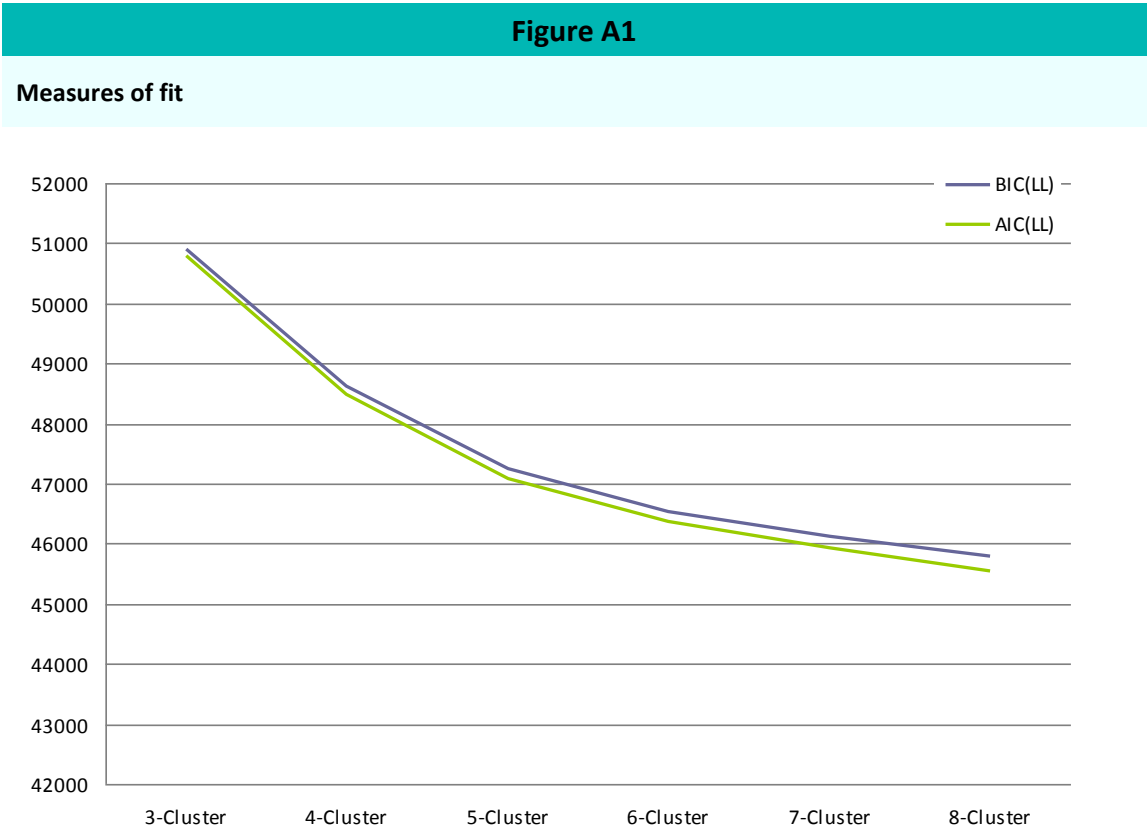
Table A.1

Misclassification error (%)

3-cluster	4-cluster	5-cluster	6-cluster	7-cluster	8-cluster
3.5	4.9	5.3	6.8	7.6	7.7

Table A.2

% of cases with cluster membership probability less than 0.6 (six-cluster solution)

	Cluster A	Cluster B	Cluster C	Cluster D	Cluster E	Cluster F
%	<0.00	<0.02	<0.00	<0.4	<0.9	<0.9
N	*1174*	*1107*	*657*	*589*	*505*	*149*

Table A.3

Stability of clusters (six-cluster solution)

	Cluster A	Cluster B	Cluster C	Cluster D	Cluster E	Cluster F	*All*
Cluster A	0	1106	0	54	205	5	*1370*
Cluster B	1174	0	0	0	0	0	*1174*
Cluster C	0	1	657	0	300	0	*958*
Cluster D	0	0	0	535	0	0	*535*
Cluster E	0	0	0	0	0	144	*144*
All	1174	1107	657	589	505	149	*4181*

Rationale for choice of solution:

A six class analysis was the preferred solution. This was for a number of reasons. Firstly, AIC and BIC figures were lower for the six class solution than the five or four class solutions. Although as shown in Figure A1, AIC and BIC values were not lowest for the six class solution, they did start to flatten out as class numbers increased. Classification error increased as the number of classes increased, therefore a higher number of classes was not preferred. Finally, the seven and eight class solutions produced classes with very small bases sizes (less than 50) making meaningful analysis difficult. All classes within the six class solution had reasonable base sizes and were interpretable. There was a very low percentage of cases with a probability of membership of less than 0.6 and this solution was very stable (meaning both that it could be replicated numerous times and as shown in Table A.3 adding an additional class split one class but (largely) left others unchanged).

Taking Part Survey latent class analysis

Variables entered into Latent Gold:

- Participation in each individual gambling activity in the past 12 months (15 activities individual: nominal)

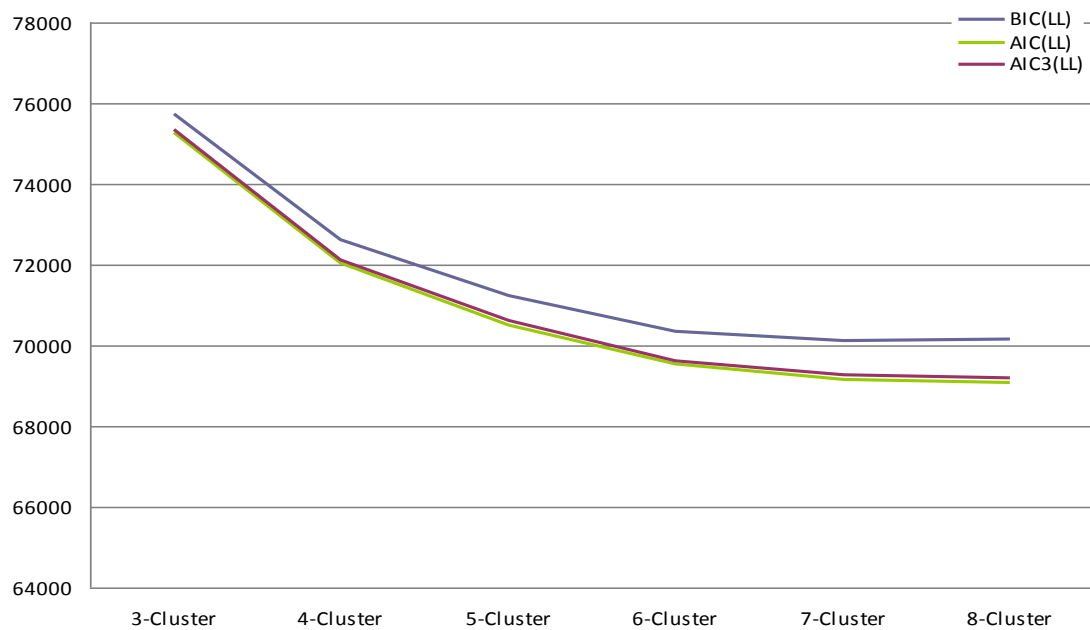- Total number of gambling activities (continuous)

Figure A2

Measures of fit

Table A.4

Misclassification error (%)

3-cluster	4-cluster	5-cluster	6-cluster	7-cluster	8-cluster
0.96	0.13	0.01	0.01	0.02	0.01

Table A.5

% of cases with cluster membership probability less than 0.6 (six-cluster solution)

	Cluster A	Cluster B	Cluster C	Cluster D	Cluster E	Cluster F
%	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
N	1174	1107	657	589	505	149

Table A.6

Stability of clusters (six-cluster solution)

	Cluster A	Cluster B	Cluster C	Cluster D	Cluster E	Cluster F	*All*
Cluster A	5908	0	0	0	0	0	*5908*
Cluster B	0	4681	0	0	0	0	*4681*
Cluster C	0	0	1272	0	0	566	*1838*
Cluster D	0	0	0	1110	0	0	*1110*
Cluster E	0	0	0	0	978	0	*978*
All	*5908*	*4681*	*1272*	*1110*	*978*	*566*	*14515*

Rationale for choice of solution:

A six class analysis was the preferred solution. With this model, classification error to all solutions was low and base sizes were reasonable. Therefore, greater focus was given to goodness of fit statistics, stability and interpretability. Firstly, AIC and BIC figures were lower for the six class solution than the five or four class solutions and were similar to seven and eight class solutions. In terms of interpretability, both the six and seven cluster solutions gave defensible groups. However, the seven cluster solution was quite unstable meaning that when it was rerun it did not always return the same result. By contrast the six class solution was stable (all models were reproduced a minimum of five times to check this). As can be seen from table A.6, the six class solution was also stable in terms of adding a coherent class as extending the model from five to six classes split one class (cluster c) into two but left other groups unchanged.

Youth tracking survey latent class analysis

Variables entered into Latent Gold:

- Participation in each individual gambling activity in the past 12 months (14 activities individual: nominal)

- Total number of gambling activities (continuous)

Figure A3

Measures of fit
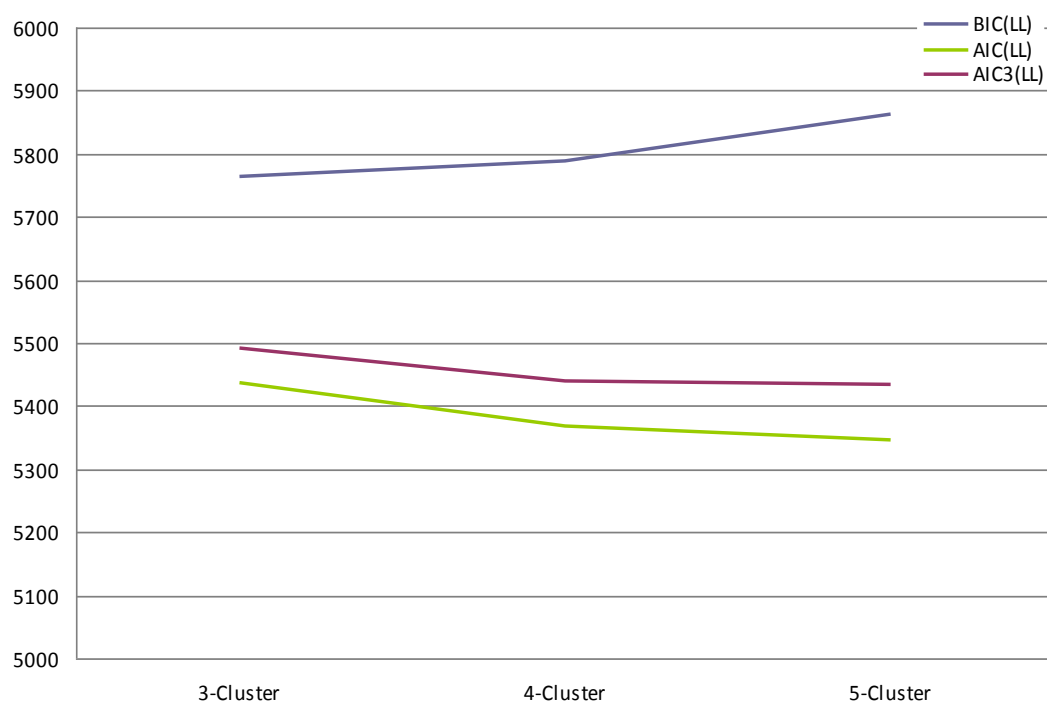
Table A.7

Misclassification error (%)

3-cluster	4-cluster	5-cluster
0.48	0.91	0.71

Table A.8

% of cases with cluster membership probability less than 0.6 (four-cluster solution)

	Cluster A	Cluster B	Cluster C	Cluster D
%	<0.00	<0.01	<0.00	<0.07
N	*2425*	*229*	*54*	*30*

Table A.9

Stability of clusters (four-cluster solution)

	Cluster A	Cluster B	Cluster C	Cluster D	*All*
Cluster A	2425	0	0	0	2425
Cluster B	0	219	47	0	266
Cluster C	0	10	7	30	47
All	2425	229	54	30	2738

Rationale for choice of solution:

A four class analysis was the preferred solution. With this model, only up to a five class solution was tested. Beyond this, base sizes became too small to allow meaningful analysis. The four class solution had lower AIC values than the three class solution and similar values to the five class solution. Classification error to all solutions was low. The four class solution was stable in terms of replication though was not as stable in terms of adding an additional class. The main reason that the four class solution was chosen was interpretability. It gave four coherent classes whose profile was consistent with existing theory. The five class solution produced classes with base sizes too small for meaningful analysis.

Treatment data latent class analysis

Variables entered into Latent Gold:

- Each of the DSM-IV items (10 items: nominal)
- Total DSM-IV score (out of ten) (ordinal)

Figure A4

Measures of fit
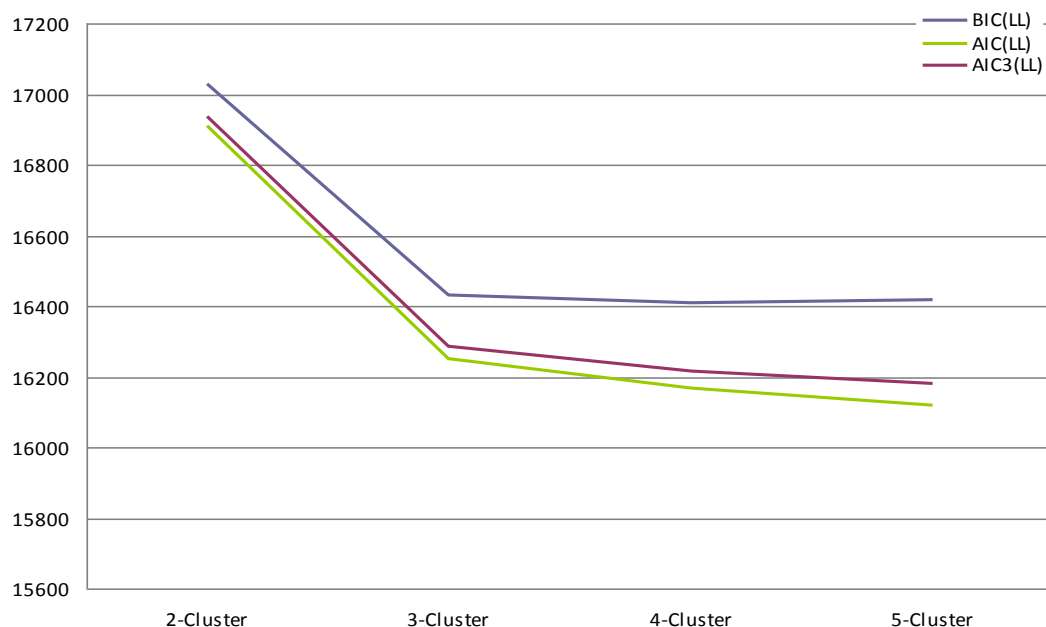
Table A.10

Misclassification error (%)

2-cluster	3-cluster	4-cluster	5-cluster
0.1	9.7	13.3	22.3

Table A.11

% of cases with cluster membership probability less than 0.6 (three cluster solution)

	Cluster A	Cluster B	Cluster C
%	<0.00	<0.03	<0.07
N	625	478	89

Table A.12

Stability of clusters (three-cluster solution)

	Cluster A	Cluster B	Cluster C	All
Cluster A	625	468	0	1093
Cluster B	0	10	89	99
All	625	478	89	1192

Rationale for choice of solution:

A three class analysis was the preferred solution. With this model, only up to a five class solution was tested. This was because beyond this base sizes became too small to allow meaningful analysis. The three to five class solutions had lower BIC and AIC values. However, classification error increased as the number of classes increased. For a five class solution it was 22.3% and 13.3% for a four class solution. Classification error was higher with the three class solution but this was both stable in terms of repeatability and in terms of dividing classes. AIC and BIC values were low and there were very few women in each cluster with a probability of membership of less than 0.6. Therefore the three class solution was the preferred option. This also gave three meaningful and distinct groups which made intuitive sense based on review of the distribution of problem gambling scores among women.

Factor analysis procedure

Overview

Chapter 7 includes an exploratory factor analysis of DSM-IV scores among women presenting for treatment. This section provides more detail on this factor analysis and how the final factor solution was chosen.

Tetrachoric correlations

Factor analysis is typically undertaken when there is an ordinal measurement of an attitude, behaviour or value. In the treatment data, responses to the DSM-IV were binary coded; clients either experienced the behaviour or did not. Factor analysis can be performed on binary data but this needs to be based on a tetrachoric correlation matrix rather than the more standard Pearson's correlation matrix. Tetrachoric correlations are used for binary data and typically assume that these binary data represent an underlying latent trait that is continuously distributed. (i.e., whether someone has chased losses in the past month is binary coded but the behaviour itself actually exists upon a continuum of those who have done this just once (or not at all) to those who have done this everyday). In this case, the DSM-IV items, though binary coded, represent a continuum of gambling behaviour and so using tetrachoric correlations is appropriate. Factor analysis based on a tetrachoric correlation matrix was performed using Stata v12.

Items included in the factor analysis

Tetrachoric correlations between all pairs of the 10 items were examined (see Chapter 7 of thesis). Most items displayed some degree of correlation with other items. However, three criteria (committing crime to fund gambling, financial bailout and risking a job/opportunity/relationship) did not correlate highly with other items. However, these three criteria were the items identified by Orford et al (2010) as loading onto a separate factor measuring gambling-related harm and were therefore retained.

Final factor solution

The final factor solution presented in Chapter 7 was the end product of a number of exploratory phases. To decide which solution best fit the data, a number of criteria were used.

1) Firstly, all factors with eigenvalues greater than 1 were retained. Only one factor had an eigenvalue of 1 or more.

2) Secondly, a scree plot was examined to see if other factors were evident. This suggested the presence of a second factor (see Figure A5)

3) Finally, the rotated factors were examined to assess which solution was easiest to interpret.

In addition, to examine how well the data fit the model, one factor, two factor and three factors were also compared and review based on the guidance set out by Costello and Osborne (2005). They recommend choosing a final model which has the cleanest factor structure (i.e., loadings above 0.3) and fewer items cross loading. Examination of total variance explained is often another criteria used to determine how many factors should be retained. However, eigenvalues from factor 6 onwards were negative making total variance explained unreliable (Lorenzo, 2013). Based on review of steps 1-3, a two factor model was chosen as the preferred solution. This also conformed to existing knowledge about the factor structure of the DSM-IV measurement instrument (Orford et al, 2003; Orford et al, 2010).

Finally data were rotated using oblique (promax) rotation methods. Use of oblique rotation methods is less common that orthogonal rotation. Oblique rotation methods allow the resulting factors to be correlated whereas orthogonal methods assume that the resulting factors are independent. However, given that the factor analysis was assessing the number of dimensions of an underlying construct of problem gambling the assumption of independence between the factors is unsound. The factors are more likely to be correlated. Other academics analysing similar data have used oblique rotation method for this reason (c.f. Christiansen et al, 2014, Stewart et al, 2008). Therefore, oblique rotation was used. However, both rotation methods were tested and gave similar results (see table A.13).

Figure A5

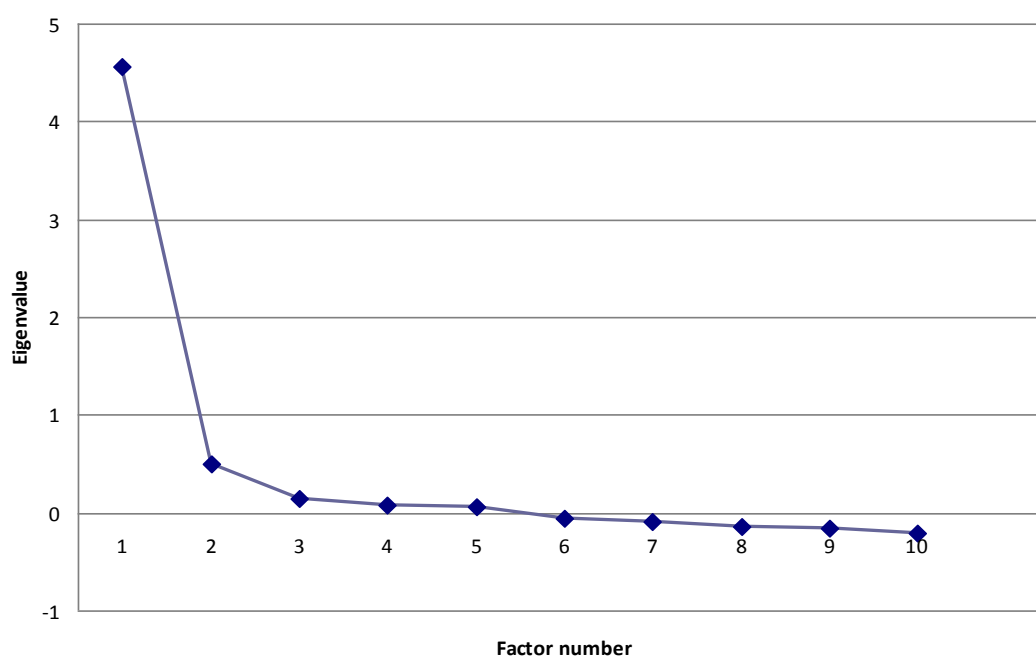**Scree plot for factor analysis of DSM-IV items**

Table A.13

Comparison of factor loadings using orthogonal and oblique rotations

	Orthongonal rotation		Oblique rotation	
	Factor 1	Factor 2	Factor 1	Factor 2
Preoccupied with gambling	0.69	0.37	0.62	
Need to gamble with increasing amounts of money to get same excitement	0.70		0.72	
Made unsuccessful attempt to stop gambling	0.70		0.75	
Restless or irritable when attempting to stop gambling	0.68		0.70	
Gambled as a way of escape	0.70		0.71	
Chased losses	0.72	0.37	0.66	
Lied to family and friends about extent of gambling	0.61	0.48	0.49	0.38
Committed an illegal act to fund gambling		0.56		0.62
Risked job or relationship or opportunity because of gambling		0.55		0.56
Relied on others for money	0.43	0.48		0.44

Geographical analysis procedure

The following steps document how the excess risk ratios were produced. Some limitations of the analysis are then discussed.

Step 1: Identifying and geolocating gambling venues in Great Britain

This was done using the 2010 premise register kept by the Gambling Commission (GC) showing the location of all licensed gambling premises who have either a) been granted a premises license, b) have submitted a license application or c) have had have a license revoked or rejected or where it has lapsed. For analysis presented within this thesis, premises were only included if they were coded as currently having an active licence (i.e., coded as "Granted" in the GC register).

There were numerous limitations of using this database. Firstly, it is compiled from Local Authority returns. This means it is subject to recording error as the register is dependent on Local Authorities both completing the information accurately and submitting it in a timely manner. The Gambling Commission has since recognised these potential sources of error and has stopped relying on Local Authority returns when calculating number of gambling premises (Gambling Commission, 2013). There were some venues (357) where postcode was not recorded, or where postcode was recorded incorrectly. These entries were checked and manually verified using address information to look-up postcodes. Out of 357 venues with no valid postcode only 67 could not be identified after this process.

Once postcodes had been cleaned, checked and verified, this dataset was merged (by postcode) with the Office for National Statistics (ONS) postcode database. This merged a range of other geographical indicators onto the premise dataset, such as Government Office Region, Output Area (OA), Middle Super Output Area (MSOA), Lower Super Output Area (LSOA). A variable aggregating the number of premises per geographic unit were then created.

Step 2: computing excess risk scores

Consideration was given to the level of geography to be used for analysis. MSOA were chosen for a number of reasons. Firstly, lower level geographies (like Lower Super Output Areas or Output Areas) would have likely been too small to allow meaningful analysis. They represent local areas with populations of 1500 people or 300 people respectively. In urban areas, this represents very small geographic spaces and is unlikely to fully represent the local area in which people live. With Output Area, the lowest level of geography available, this limitation would be amplified. Secondly, the analysis presented in this thesis represents only the first exploratory attempt to examine the relationship between gambling provision and gambling behaviour. Therefore a well established and recognised geographical boundary was chosen for this initial exploration. Thirdly, unit postcodes are coded to the centroid of the area as they typically cover 15 addresses. Error can be introduced when aggregating unit postcodes to small area geographies. LSOAs are the smallest areas which pick out postcode centroids effectively, followed by MSOAs. Therefore, for this exploratory analysis, it was decided to use MSOAs.

Shape files for MSOA were downloaded from the ONS geoportal. These files were loaded into GeoDa and linked by MSOA code to the premise database showing the number of premises per MSOA. Population data at MSOA level was downloaded from ONS neighbourhood statistics portal. This is based on census data and shows the number of men, women and children living in Great Britain at various levels of geography. The data was then matched by MSOA code to the premise register and linked to MSOA shape files using GeoDa.

GeoDa has a function to calculate and map excess risk ratios. It does this by calculating the number of venues per head of the population. This gives a population average. The number of venues per head of population is then calculated for each MSOA. This is divided by the population average to give a ratio. A ratio of 1 means the rate at the MSOA level is the same as the population level. A ratio of less than 1 means the number of gambling venues is lower than expected given the population in that area and a ratio higher than 1 means the number of gambling venues is

higher than expected. Essentially, it identifies areas where there are a greater number of gambling venues than expect given their resident population. The ratios are then mapped spatially according to this scale (see Figure 6.2 in thesis). Crucially, GeoDa simply maps the spatial distribution. It does not assess whether this distribution is statistically significant.

Step 3: Analysis of gambling behaviour by excess risk ratios

The excess risk ratios computed in GeoDa were exported into tabular format. They were then linked to BGPS 2010 survey data using the MSOA code of each respondent's home address. Usually access to low level geographies for survey data is not released to researchers. However, as Project Director of the British Gambling Prevalence Survey 2010 and as Data Controller for this study, I had access to this information. Permission to use this information in this way was granted by NatCen's Data Release Panel. In terms of confidentiality, the main point is that data of where respondents live was not being visualised: only the MSOA code of the area in which they reside was used to merge on data about gambling venue density and to create a derived variable for analysis (these identifiers have been removed from the data deposited in the dropbox archive).

Following this procedure, every respondent to the 2010 survey had an excess risk ratio denoting the ratio of gambling venues to adult population in the MSOA in which they lived. This was then grouped into a derived variable for analysis. Categories were:

0	No gambling venues in MSOA
1	Excess risk ratio of less than 1 but more than 0
2	Excess risk ratio of more than 1 but less than 1.89
3	Excess risk ratio of more than 1.89

An excess risk ratio of 1.89 was one standard deviation from the national mean and was used to identify higher levels of exposure to gambling venues in the immediate area. A similar approach was used when identifying high density machine zones (see

Wardle et al, 2011c). This variable was then used in the analysis of variations in individual gambling behaviour.

Limitations of the approach

As noted in Chapter 6, the spatial analysis presented in this thesis was intended as a preliminary investigation to highlight how different sources of information might be used in a realist descriptive investigation. A number of the decisions in the analytical procedure, documented above, may affect results and should be further considered if this analysis is to be extended.

The first is the Modifiable Areal Unit Problem. This relates to the aggregation of spatial data to different levels of geography. The aggregation process and the unit of spatial analysis chosen (in this case MSOA) can introduce error into analysis. Put simply, using different spatial units of aggregation can give different results (O'Sullivan & Unwin, 2003). Furthermore, all statistics (like excess risk ratios) computed at the level of aggregation inherit this error. Therefore, it would be advisable to examine how results vary using different levels of geographies or by employing other techniques, such as kernel density analysis to identify areas with a 'high' number of gambling venues. A second concern is the ecological fallacy. That is it is not always possible to extrapolate patterns from one level of aggregation to a lower and more detailed level of aggregation. A pattern may be evident at MSOA level that is not evident at LSOA level because there are a range of countervailing mechanisms at work (O'Sullivan & Unwin, 2003). Again the possible presence of the ecological fallacy suggests that the analysis presented in this thesis be subject to further and more specialist spatial investigation. Finally, this analysis only considered the relationship between a person's gambling behaviour and the area in which they live. Gambling premises are typically in high street locations, where people work or meet to socialise. Therefore, some people may conduct much of their daily lives in areas with greater access to gambling venues but this will not be represented in the analysis presented in this thesis if they do not also live in these areas. The analysis presented in this thesis does not take into account this broader relationship between people, place and behaviour (Cummins et al, 2007). This too should be considered.

Appendix D: Ethical approval

Because the majority of the datasets used in this thesis were created by NatCen Social Research (the BGPS series and the combined HSE/SHeS gambling data) and accessed through my position as Principal Investigator of both studies, ethical approval for this project was sought from NatCen's Independent Research Ethics Committee. A copy of the approval letter is provided below.

NatCen Social Research has an ethics governance procedure that meets the requirements of the ESRC and Government Social Research Unit Research Ethics Frameworks. Research projects are scrutinised by NatCen's Independent Research Ethics Committee (REC) consisting of senior staff and external experts. Depending on the nature of the research and the perceived level of risk, projects undergo either an expedited review (scrutiny by the REC Chair), a proportionate review (by the REC Chair and another REC member) or a full review by the sitting REC. This project qualified for an expedited review and was approved.

NatCen

Social Research that works for society

Application: Female Gambling Behaviour   Email: catherine.odonnell @natcen.ac.uk

Direct Line: 0207 549 9584

18th August 2013

Dear Heather

RE: REC Application

Thank you for submitting your application for ethical review.

I am writing to you to let you know the decision of the REC with regards to your project,

Your study has been:

- Approved

Please do not hesitate to contact me should you have any questions.

Yours sincerely,

Catherine O'Donnell
NatCen REC Administrator