



STUDY PROTOCOL

# The Emerging Adults Gambling Survey: study protocol

**[version 1; peer review: 2 approved]**

Heather Wardle

Faculty of Public Health and Policy, London School of Hygiene &amp; Tropical Medicine, 15-17 Tavistock Place, London, WC1H9SH, UK

---

**V1** **First published:** 26 May 2020, 5:102  
<https://doi.org/10.12688/wellcomeopenres.15969.1>  
**Latest published:** 26 May 2020, 5:102  
<https://doi.org/10.12688/wellcomeopenres.15969.1>

---

## Abstract

The Emerging Adults Gambling Survey is a longitudinal survey of young adults aged 16-24 living in Great Britain. It aims to explore a range of gambling behaviours and harms among young adults and examine how this changes over time. It is part of a broader project funded by Wellcome into the gambling behaviours of young people and its relationship with technological change. Funding is currently available for two waves of data collection: the first collected in June/August 2019 (n=3549) and the second to be collected in June/August 2020. The second wave of data collection will also obtain information about the immediate impact of coronavirus on gambling behaviours. With a sample size of 3549 for Wave 1, this is one of the largest study of gambling behaviours among young adults to be conducted in Great Britain and is a resource for other researchers to draw on. Data will be deposited in the UK Data Archive upon completion of Wave 2 data collection and analysis. This protocol is intended to support other researchers to use this resource by setting out the study design and methods.

## Keywords

gambling, gaming, emerging adults, protocol, longitudinal

## Open Peer Review

**Approval Status**

	1	2
<b>version 1</b> 26 May 2020	 <a href="#">view</a>	 <a href="#">view</a>

1. **Rachel Volberg** , University of Massachusetts, Amherst, USA
2. **Max Abbott**, Auckland University of Technology, Auckland, New Zealand

Any reports and responses or comments on the article can be found at the end of the article.

**Corresponding author:** Heather Wardle ([heather.wardle@lshtm.ac.uk](mailto:heather.wardle@lshtm.ac.uk))

**Author roles: Wardle H:** Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Writing – Original Draft Preparation

**Competing interests:** Between 2015 and March 2020, HW was the Deputy Chair of the Advisory Board for Safer Gambling, which provided advice to the Gambling Commission and Government on policy and regulatory issues. In the last three years, she has worked on one project funded by GambleAware. HW runs a research consultancy, providing research services to public and third sector bodies. She does not and has not provided consultancy services for the gambling industry.

**Grant information:** The project is funded by Wellcome Trust through a Humanities and Social Sciences Fellowship to HW [200306]. *The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.*

**Copyright:** © 2020 Wardle H. This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**How to cite this article:** Wardle H. **The Emerging Adults Gambling Survey: study protocol [version 1; peer review: 2 approved]** Wellcome Open Research 2020, 5:102 <https://doi.org/10.12688/wellcomeopenres.15969.1>

**First published:** 26 May 2020, 5:102 <https://doi.org/10.12688/wellcomeopenres.15969.1>

## Introduction

Since the turn of the 21<sup>st</sup> century, the provision of gambling opportunities has expanded rapidly. This is partly due to change in technological infrastructure, allowing the development of new methods of gambling as well as new gambling products (e.g., in-play betting markets reliant on the rapid communication of data to operate). This is also partly due to an ongoing process of liberalisation of gambling legislation, positioning gambling into mainstream leisure activities (Light, 2007). This occurred in Great Britain with the 2005 Gambling Act (fully enacted in 2007) and is replicated in other jurisdictions, especially North America where online gambling is being legalised on a state-by-state basis. Most recently, the state of Michigan has permitted online sports betting and betting via mobile phones for the first time (State of Michigan, 2019).

Young people are growing up in fundamentally altered environment for gambling, especially in Great Britain, where gambling, gaming and digital technology are increasingly intertwined (Responsible Gambling Strategy Board, 2018). Those aged 16–24 are the first cohort whose adolescence and childhood occurred in an environment when online gambling was always freely available and gambling, generally, was heavily promoted and marketed. Some academics have argued that when regulatory or legislative changes occur, especially in expanding gambling opportunities, some populations respond by changing behaviour in the short term but adapt in the longer term by reverting to pre-change patterns of behaviour; the so-called “adaption” theory (LaPlante & Shaffer, 2007). LaPlante and Shaffer noted that social context was vitally important when seeking to understand exposure effects. For those aged 16–24 living in Great Britain, this is likely to be even more pertinent: it is uncertain whether such adaptation occurs as this cohort have grown up knowing no other regulatory or legislative environment; they have no prior experience to revert to. This has led to increasing concern about the ‘normalisation’ of gambling among young people (Responsible Gambling Strategy Board, 2018).

It is therefore vital to explore gambling behaviours among this cohort and how this may be changing over time. This Emerging Adults Gambling Survey focuses on those aged 16–24 as both the first cohort to fully experience the altered gambling landscape ushered in by the Gambling Act 2005 and because of their status as ‘emerging adults’. Coined by Jeffrey Arnett (2000), emerging adulthood describes an age group who he argues are both demographically distinct and distinct in terms of their subjective perceptions and identity exploration. Arnett (2000) identified a greater propensity for risk taking behaviour among emerging adults, arguing they may wish to obtain a wide range of experiences before settling into adult roles and responsibilities or that freed from parental constraints or adult responsibilities, they could engage in sensation-seeking experimentation (though notably, the 21<sup>st</sup> century has seen a marked decline in some risk-taking behaviours among this cohort; IAS, 2016). Nonetheless, this age group currently represents a unique cohort experiencing a range of life transitions and changes, within a vastly altered gambling environment, and are thus worthy of greater attention.

A critical consideration is the experience of gambling harms. Gambling harms are the adverse impacts from gambling on the health and wellbeing of individuals, families and communities (Wardle *et al.*, 2019). As noted by Wardle *et al.*, these harms are diverse, affecting health, wealth and relationships and may reflect an interplay between individual, family and community processes, exacerbating existing inequalities for some. Gambling harms are the consequences associated with gambling and thus extend more broadly than previously acknowledged (Wardle *et al.*, 2019). Among young people, the harms from gambling have a further dimension affecting future opportunities and development either through the impact of their own gambling or the gambling of others (Blake *et al.*, 2019). Academic insight into broader harms associated with gambling among young adults is sparse as is insight on the relationship between gambling and broader health and wellbeing, including suicidality.

In Britain, as elsewhere, monitoring of gambling behaviours has tended to focus on the measurement of gambling participation and problem gambling in repeat cross-sectional surveys, typically demonstrating stable patterns of behaviour at the population level (Conolly *et al.*, 2018). These general population studies produce national statistics for all adults in Britain but do not have sufficient power to look at the youngest cohort individually. Furthermore, it is increasingly recognised that gambling behaviour that can be fluid and variable, where changes in intensity of engagement over time are the norm and patterns of problematic gambling unstable within the individual (Breen & Hing, 2014; LaPlante *et al.*, 2008; Reith & Dobbie, 2013). Quantitative assessment of gambling behaviour change has highlighted how patterns of engagement can be episodic and transient, changing based on various social contexts and life events (Slutske *et al.*, 2003; Slutske *et al.*, 2009). Slutske, Jackson and Sher’s (2009) assessment of gambling trajectories among youth revealed a wide array of changes in behaviour despite overall prevalence rates staying constant. This tendency was observed among a follow-up study of people who held a loyalty card for British Bookmaker’s, whereby stable problem gambling prevalence rates for each wave of data collection masked a great deal of movement in and out of problem behaviour (Wardle *et al.*, 2017). However, as Reith & Dobbie (2013) have also shown, individual level gambling trajectories over time are varied and whilst stasis may not be the norm, there are groups of people for whom gambling behaviours are habitual, embedded and constant. This diversity of experience has received scant attention, especially among policy makers and politicians who tend to focus on overall prevalence rates and not the fluctuating patterns in behaviour that underlie them. As now recognised by the UK Gambling Commission in its National Strategy to Reduce Gambling Harms, there is a need for longitudinal insight into the changing gambling behaviours of young adults (Gambling Commission, 2019a). The Emerging Adults Gambling Study was design to meet this need.

Specific objectives are to investigate changes in the relationship between youth gambling behaviour, including harmful gambling outcomes, with use and integration of varying forms

of digital technology, with specific emphasis on understanding the determinants of gambling behaviour, inequalities in behaviours and the factors associated with problematic gambling among younger people.

## Protocol

### Sample frame and size

In Wave 1, the Emerging Adults Gambling Survey collected data from 3549 participants aged 16–24 living in the UK. Participants were drawn from YouGov's online panel of over one million people (Kennedy *et al.*, 2016; Twyman, 2008). This has up to date information on the profile of each member, allowing subsets of panel members to be invited to participate according to certain characteristics. For this study, participants were eligible if they were aged between 16 and 24, living in the UK and had not taken part in any other YouGov study on gambling in the past year. Wave 2 data collection will occur one year later from Wave 1, in July/August 2020. The anticipated number of respondents is c.2400, representing a likely attrition rate of 32.5%. The baseline rate of problem gambling observed in Wave 1 was 3.69%. Assuming a between wave correlation of 0.5, we will be able to detect changes in problem gambling rates between Wave 1 and Wave 2 of +/- 0.3 percentage points (at 80% power). This sample size will allow changes in gambling behaviours and problem gambling to be detected for sub-groups of participants.

YouGov is a non-probability panel, with attendant issues of generalisability. However, when researching young people it has advantages in terms of sample coverage over probability methods: surveys using the Postcode Address File as a sample frame exclude many young people living in student halls of residence; surveys of students using sampling frames from university registers exclude those not in education and results may not be generalisable to non-student populations. The YouGov panel includes both, and the Emerging Adults Gambling Survey provides a closer estimate to national statistics of the proportion of young people not in education, employment or training than 'gold-standard' probability surveys like the Health Survey for England (see Table 1). Furthermore, the primary aim of this study is to explore behaviour change over time through multi-variate and between group analyses. Whilst the sample frame may have limitations in terms of generalisability, online panels have been recommended for use in studies with these aims (Callegaro *et al.*, 2014).

### Data collection procedures

For Wave 1, email invites to participate were sent by YouGov to a random selection of their panel members, stratified by region. This email asked them to take part in a survey, without advertising its content, and asked participants to click through to the bespoke study. The first page of the bespoke survey then described the aims and objectives of the survey and obtained consent. 93% of people who accessed this page went on to complete the survey. Wave 1 data were collected between June and August 2019. Wave 2 data will be collected in July/August 2020 following similar procedures.

The survey asked about gambling, gaming, social media use and health-related behaviours. The theoretical framework guiding the Wave 1 questionnaire development was the socio-ecological model adapted for gambling by Wardle *et al.* (2019). The Wave 1 questionnaire reflected the multiple levels which may influence behaviour, ranging from individual characteristics (such as impulsivity), to family and community influences (such as parental gambling behaviours, gambling of peers, area-level deprivation) and societal influences (for example, exposure to marketing and advertising). The Wave 1 questionnaire is provided as extended data (Wardle, 2020).

The Wave 1 questionnaire was developed by Dr Wardle, reviewed by an expert panel of academics and refinements were made. A field pilot collected data from 62 participants in May 2019. Pilot responses were reviewed by the lead author and members of the YouGov team and changes agreed. The first 250 responses for the main data collection were further reviewed for consistency, accuracy of routing, and to establish timing thresholds for seriousness checks. Participants who completed the survey in less than one standard deviation of the mean completion time were removed: 39 participants were excluded from the final dataset for this reason. In Wave 1, missing data were minimal and excluded from analyses (except where explicitly stated).

Wave 2 data collection will follow similar procedures, using the Wave 1 questionnaire as its base and updating with further questions about behaviour change. In particular, it will add a suite of questions about changed circumstances and behaviours in the context of COVID-19 and the experience of lockdown conditions. The March 2020 classification of COVID-19 as a pandemic, precipitated unprecedented restrictions on people's movements and interactions in public and private settings. With the closure of commercial and social venues and cancellation of major sports events, COVID-19 altered the gambling landscape worldwide. Industry responses have been to heavily promote unaffected products (online slots/casino games, esports, virtual events, all associated with high rates of problem gambling) and/or to incentivise people to start gambling. 'Lockdown' conditions also potentially heighten risk factors for gambling and gambling harms (through boredom, stress, anxiety, financial problems, loneliness). The Wave 2 questionnaire will aim to investigate the immediate impact of these changes upon the gambling behaviours of Emerging Adults.

## Measures

**Primary outcome measures.** Participants were asked to report whether they have ever gambled on a range of 18 different gambling activities legally available in Great Britain. They were also asked to report how old they were the first time they gambled on each and how often they had gambled on each in the past 12 months. This included questions about esports betting and in-play betting. Problem gambling was measured using the Problem Gambling Severity Index (PGSI), a validated tool for the identification of gambling problems (Ferris & Wynne, 2001). This was administered to anyone who had gambled in

**Table 1. Profile of respondents to the Health Survey for England, 2017, Emerging Adults Gambling Survey and National Statistics data.**

	Data source		
	Health Survey for England 2017 (unweighted)	Emerging Adult's Gambling Survey (unweighted)	National Statistics data
<b>Sex*</b>			
Male	45.6%	45.8%	51.3%
Female	54.4%	54.2%	48.7%
<b>Ethnic group (18–24 only)**</b>			
White/White British	83.6%	86.8%	81.5%
Mixed	2.5%	3.6%	3.2%
South Asian	9.2%	7.2%	10.3%
Black	3.9%	1.5%	3.7%
Other	0.8%	0.9%	1.3%
<b>Region (England only)*</b>			
North East	7.6%	4.3%	5.0%
North West	15.6%	12.1%	13.3%
Yorkshire and the Humber	10.4%	10.8%	10.5%
East Midlands	11.7%	8.6%	9.0%
West Midlands	10.4%	9.7%	11.1%
East of England	13.1%	8.9%	10.1%
London	12.8%	17.1%	15.3%
South East	12.1%	16.4%	15.9%
South West	6.3%	12.1%	9.7%
<b>Economic activity***^</b>			
Not in Education, Employment or Training	3.4%	12.4%	11.5%

\*National statistics computed from the Office for National Statistics 2018 Mid-Population Estimates. Available at <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesforukenglandandwalesscotlandandnorthernireland>

\*\*National Statistics estimates computed from 2011 Census, available at <https://www.ethnicity-facts-figures.service.gov.uk/uk-population-by-ethnicity/demographics/age-groups/latest#age-profile-by-ethnicity>

\*\*\*National Statistics estimates from Office for National Statistics bulletin: Young People not in education, employment or training, 2019. Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/bulletins/youngpeoplenotineducationemploymentortrainingneet/august2019>

^ Because of differences in how the data were captured, it is not possible to provide equivalent estimates of the proportion of young people in each survey who are students, although it is likely that the YouGov panel over-represents student populations, as 39% of those over 18 were categorised as a student.

the past 12 months and thus produces estimates of current gambling problems. The PGSI score ranges from 0–27; a score of 0 indicated non-problem gambling or non-gambling; 1–2 is low risk gambling; 3–7 is moderate risk gambling, and a score of 8 or more is indicative of problem gambling.

Personal wellbeing was captured using the harmonised Office for National Statistics (ONS) four-item measure of personal wellbeing (ONS, 2016). This asks participants to rate on a scale of 0 to 10 their current levels of life satisfaction; whether they

do things that they feel are worthwhile; how happy they felt yesterday, and how anxious they felt yesterday.

Questions about suicidality were adapted from the Adult Psychiatric Morbidity Survey (APMS) series (McManus *et al.*, 2019). Participants were asked: ‘In the last 12 months, have you ever thought of taking your life, even if you would not actually do it?’ and ‘In the last 12 months, have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?’

**Other measures.** Questions about social media use and gaming were adapted from the Millennium Cohort Study, Wave 7 (IOE, 2020), which asked people to report how often they engaged in both on a typical weekday, with response options ranging from less than half an hour to 7 or more hours a day.

A suite of questions were adapted from the UK Gambling Commission's Youth Gambling Survey to ask about use of gambling-like mechanics within video games (Gambling Commission, 2019b). This included whether the participant had paid money to open loot boxes; opened loot boxes with in-game currency; had bet skins on external websites or had bet skins within the game.

Further questions about gambling harms were adapted from the Ipsos Mori's development work on measuring gambling harms among young people (Blake *et al.*, 2019). This included questions relating to gambling's impact on health, wellbeing and relationships. The 8-item Attitudes Towards Gambling Questionnaire was included to measure gambling attitudes and norms (Canale *et al.*, 2016; Wardle *et al.*, 2011).

Social network influences were captured through a range of questions asking about whether parents, family members or friends gambled and, if so, how often.

Questions about exposure and influence of gambling advertising and marketing were adapted from the Young People's Survey of Gambling Promotion (MacGregor *et al.*, 2020). This included questions about awareness of advertising/marketing; experience of direct marketing; use of social media to follow gambling companies; and self-reported influence of marketing/advertising on gambling behaviours.

Impulsivity was measured using a shortened form of the Eysenck Impulsivity Scale which is validated for use among adolescents [Eysenck & Eysenck, 1977; Wills *et al.*, 1998]. Participants were asked to respond on a five-point scale how true seven different statements about impulsivity are for them. Consistent with the approach taken by other studies, impulsivity scores are computed as the average of the seven questions (Auger *et al.*, 2010).

Risky alcohol consumption was identified using the Modified Single Alcohol Screening Questionnaire (M SASQ) (Canagasaby & Vinson, 2005). This consists of one item from the Alcohol Use Disorders Identification Test about frequency of consuming eight or more units of alcohol for men or six more units of alcohol for women in a single event in the past year. A score of three or more identifies higher-risk drinkers.

Perceived loneliness was assessed by one item from the Social Functioning Questionnaire (Tyler *et al.*, 2005). Participants were asked to assess with a four-category response (very much, sometimes, not often, and not at all) the extent to which they had felt "lonely and isolated from other people" in the previous two weeks.

Ethnicity was self-reported using the harmonised ONS ethnicity question. Age was captured in single age years. Local area level deprivation was measured using the respective English, Scottish and Welsh Indices of Multiple Deprivation (IMD) scores matched at the 'Output Area' and quintiled for analysis. Respondents were asked to report both their parents' level of academic attainment. This was grouped by whether at least one parent had a degree or higher or whether both parents' qualifications were lower than degree level. Housing tenure, marital status and employment status were also collected in accordance with harmonised ONS questions. Respondents were asked to report their household's total income and their own personal income.

### Data analysis

A range of analyses are planned utilising both Wave 1 to explore within group behaviours and Waves 1 and 2 to look at behaviour change. Analyses planned using Wave 1 data include assessment of the relationship between problem gambling and suicide attempts. This will follow the analytical procedure used by Wardle *et al.* (2020) to replicate analyses among Emerging Adults. Analyses will also include investigation of the profile and relationship to problem gambling among those who engage in gambling-like mechanics within video games and problem gambling. Using hierarchical regression, this will explore the extent to which the relationship between gambling-like mechanics is accounted for by other potentially confounding variables, like broader gambling engagement or underlying personality traits such as impulsivity. Wherever possible, analyses will be conducted separately for men and women.

Behaviour change will be examined between Waves 1 and 2 by identifying those whose gambling (and problem gambling) behaviour remained the same (including those who were abstinent); those whose behaviours increased and those whose behaviours decreased between waves. Multi-variate analyses will examine the factors associated with each, with the referent group for each model being those whose behaviours were the same at Wave 1 and did not deviate. This replicates the analytical procedures used by Graham *et al.* (2019) when examining changes in smoking, alcohol consumption, fruit and vegetable consumption and physical activity. This will include controls for a standard set of socio-demographic and economic factors, like age and deprivation. From this the incidence of problem gambling among this group will be calculated.

All multi-variate analyses will be subject to diagnostic tests for multi-collinearity by calculating the variance inflation factors (VIF) of all independent variables. A VIF value of less than 2 will be used as the threshold to indicate the presence of collinearity or not. Analyses will be performed using the complex survey function in SPSS v21 and Stata v15 to adjust for weighted stratified survey design. These complex survey modules produce a Walds F-test as the default test of significance (Rao & Scott, 1984). For bivariate analyses, this assesses the extent to which the independent variable (suicide attempts, for example) varies by the dependent variables (age or problem gambling status, for example) and is the test on which all

p-values are based. All estimates will be weighted to match the age, sex and regional profile of 16 to 24 year olds living in Great Britain. Additional weights for non-response between Waves 1 and 2 will be computed. Analyses will use weighted data and controlled for the stratified survey design and true (unweighted) bases will be presented.

### Ethics

Ethical approval for the study was granted by London School of Hygiene and Tropical Medicine's Ethics Review Panel (ref: 15960). All participants, regardless of study responses, were provided with a list of help and supporting services at the end of the survey should they wish to speak with anyone about the issues raised. Following the procedure used in the Adult Psychiatric Morbidity Survey, all participants reporting suicide attempts were directed to speak with their General Practitioner.

### Dissemination, engagement and data availability

Findings will be disseminated through a range of methods, including but not limited to: academic journal articles, conference papers, short briefing papers presenting lay summaries to key policy makers (including the Gambling Commission, Politicians on the All Party Parliamentary Group on Gambling Harms, the WHO gambling panel, of which Dr Wardle is a member), verbal presentation of results formally and informally to key stakeholders, engagement with national press and blogs/commentaries. Dr Wardle has a strong range of networks, through her role as Deputy Chair of the Advisory Board for Safer Gambling, which provides advice to government on gambling policy, and will leverage these networks to ensure impact.

Fully anonymised datasets, after disclosure checks, will be made available as a resource to others at the end of the grant award and will be deposited with the UK Data Archive. Until that point, data will be available on request from the author to allow adherence with Open Science principles.

**Study status.** At the date of writing (May 2020), data from Wave 1 had been collected and analysed and questionnaire content for Wave 2 data collection planned, with fieldwork to be completed in July/August 2020. Funding options to extend the study to include a third wave of data collection, in July/August 2021 are being explored. The project will be completed by the end of the fellowship in March 2022.

### Conclusions

The landscape for gambling has changed rapidly in the last decade, with attendant questions of impact on young people. Despite stated need for longitudinal studies to explore behaviour change among young adults, few studies worldwide have examined this. This study aims to help fill this gap by exploring changing gambling behaviours among Emerging Adults in Britain, who are the first cohort of British youth to have grown up within the vastly altered regulatory environment created by the implementation of the Gambling Act 2005. In addition, the gambling landscape has recently experienced a short-term shock through the impact of COVID-19 on business and sporting events. This study will enable some examination of the immediate impact of COVID-19 on gambling behaviours, though longer term assessment would also be desirable. It is anticipated that findings will be incorporated into policy and regulatory change, especially as the Conservative Government has committed to review the Gambling Act 2005 with focus on the increasing recognition of gambling as a public health issue. Understanding the impact of gambling on young people is a vital component of this.

### Data availability

#### Underlying data

No data are associated with this article.

#### Extended data

Open Science Framework: Emerging Adults Gambling Survey. <https://doi.org/10.17605/OSF.IO/ND8WT> (Wardle, 2020)

This project contains the following extended data:

- Emerging Adults Wave 1 questionnaire.docx (Wave 1 questionnaire)

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/) (CC-BY 4.0).

### Acknowledgements

Thanks are due to Sally McManus for commenting on this draft and Professors Catherine Law, Lucinda Platt, Gerda Reith and Sonia Livingstone for providing advice and oversight on the study development.

### References

- Arnett JJ: **Emerging adulthood. A theory of development from the late teens through the twenties.** *Am Psychol.* 2000; 55(5): 469–480. [PubMed Abstract](#) | [Publisher Full Text](#)
- Auger N, Lo E, Cantinotti M, *et al.*: **Impulsivity and socio-economic status interact to increase the risk of gambling onset among youth.** *Addiction.* 2010; 105(12): 2176–2183. [PubMed Abstract](#) | [Publisher Full Text](#)
- Blake M, Pye J, Mollitor J, *et al.*: **Measuring gambling-related harms among children and young people: a framework for action.** Gambling Commission:

Birmingham. 2019. [Reference Source](#)

Breen H, Hing N: **Life course analysis of gambling trajectories: an indigenous Australian Study.** *Int Gambli Stud.* 2014; 14(3): 357–373. [Publisher Full Text](#)

Callegaro M, Villar A, Krosnick J, *et al.*: **A critical review of studies investigating the quality of data obtained with online panels based on probability and nonprobability samples.** In: M Callegaro, R Baker, J Bethlehem, A Goritz, J Krosnick & P Lavrakas (Eds.), *Online Panel Research: A Data Quality Perspective.*

UK: John Wiley & Sons. 2014; 23–53.

[Publisher Full Text](#)

Canagasaby A, Vinson DC: **Screening for hazardous or harmful drinking using one or two quantity-frequency questions.** *Alcohol Alcohol.* 2005; 40(3): 208–213.

[PubMed Abstract](#) | [Publisher Full Text](#)

Canale N, Vieno A, Pastore M, *et al.*: **Validation of the 8-item Attitudes Towards Gambling Scale (ATGS-8) in a British population survey.** *Addict Behav.* 2016; 54: 70–74.

[PubMed Abstract](#) | [Publisher Full Text](#)

Conolly A, Davies B, Fuller L, *et al.*: **Gambling behavior in Great Britain in 2016.** Birmingham: Gambling Commission. 2018.

[Reference Source](#)

Eysenck SB, Eysenck HJ: **The place of impulsiveness in a dimensional system of personality description.** *Br J Soc Clin Psychol.* 1977; 16(1): 57–68.

[PubMed Abstract](#) | [Publisher Full Text](#)

Ferris J, Wynne H: **The Canadian Problem Gambling Index: Final report.** Ottawa: Canadian Centre on Substance Abuse. 2001.

[Reference Source](#)

Graham HM, Wardle H, Law C, *et al.*: **Health behaviour and health behaviour change among adults in England.** University of York. 2019.

[Reference Source](#)

Gambling Commission: **National Strategy to Reduce Gambling Harms.** Gambling Commission: Birmingham. 2019a.

[Reference Source](#)

Gambling Commission: **Young People and gambling survey: a research study among 11-16 year olds in Great Britain.** Gambling Commission: Birmingham. 2019b.

[Reference Source](#)

Institute of Alcohol Studies: **Youthful abandon. Why are young people drinking less?** IAS: London. 2016.

[Reference Source](#)

Institute of Education: **Millenium Cohort Study Seventh Sweep: Age 17 survey: Young person's online questionnaire.** IOE: London. 2020.

[Reference Source](#)

Kennedy C, Mercer A, Keeter S, *et al.*: **Evaluating Online Nonprobability Surveys.** *Pew Research.* 2016; Accessed 10.03.2020.

[Reference Source](#)

LaPlante DA, Nelson SE, LaBrie RA, *et al.*: **Stability and progression of disordered gambling: lessons from longitudinal studies.** *Can J Psychiatry.* 2008; 53(1): 52–60.

[PubMed Abstract](#) | [Publisher Full Text](#)

LaPlante DA, Shaffer HJ: **Understanding the influence of gambling opportunities: expanding exposure models to include adaptation.** *Am J Orthopsychiatry.* 2007; 77(4): 616–623.

[PubMed Abstract](#) | [Publisher Full Text](#)

Light R: **The Gambling Act 2005: Regulatory Containment and Market Control.** *Mod Law Rev.* 2007; 70(4): 626–653.

[Publisher Full Text](#)

McManus S, Bebbington PE, Jenkins R, *et al.*: **Data resource profile: Adult Psychiatric Morbidity Survey (APMS).** *Int J Epidemiol.* 2019; pii: dyy224.

[PubMed Abstract](#) | [Publisher Full Text](#)

MacGregor A, Elliot J, Shield C: **The effect of marketing and advertising on children, young people and vulnerable people: Quantitative Research Report.** GambleAware: London. 2020.

[Publisher Full Text](#)

Office for National Statistics: **Personal well-being in the UK: 2015 to 2016.** Newport: Office for National Statistics. 2016.

[Reference Source](#)

Rao JN, Scott AJ: **On chi-squared test for multi-contingency tables with cell proportions estimated from survey data.** *Ann Stat.* 1984; 12(1): 46–60.

[Publisher Full Text](#)

Reith G, Dobbie F: **Gambling careers: a longitudinal qualitative study of gambling behaviour.** *Addict Res Theory.* 2013; 21(5): 376–390.

[Publisher Full Text](#)

Responsible Gambling Strategy Board: **Children, young people and gambling: a case for action.** Birmingham: Gambling Commission. 2018.

[Reference Source](#)

Slutske W, Blaszczyński A, Martin G: **Sex differences in the rates of recovery, treatment-seeking, and natural recovery in pathological gambling: results from an Australian community-based twin survey.** *Twin Res Hum Genet.* 2009; 12(5): 425–432.

[PubMed Abstract](#) | [Publisher Full Text](#)

Slutske W, Jackson J, Sher K: **The natural history of problem gambling from age 18 to 29.** *J Abnorm Psychol.* 2003; 112(2): 263–274.

[PubMed Abstract](#) | [Publisher Full Text](#)

State of Michigan: **Lawful internet gaming act.** Michigan. 2019.

[Reference Source](#)

Twyman J: **Getting it right: YouGov and online survey research in Britain.** *J Elect Public Opin Parties.* 2008; 18(4): 343–54.

[Publisher Full Text](#)

Tyrer P, Nur U, Crawford M, *et al.*: **The Social Functioning Questionnaire: a rapid and robust measure of perceived functioning.** *Int J Soc Psychiatry.* 2005; 51(3): 265–75.

[PubMed Abstract](#) | [Publisher Full Text](#)

Wardle H: **Emerging Adults Gambling Survey.** 2020.

<http://www.doi.org/10.17605/OSF.IO/ND8WT>

Wardle H, Fuller E, Maplethorpe N, *et al.*: **Follow-up study of loyalty card customers: gambling behaviour over time.** London: GambleAware. 2017.

[Reference Source](#)

Wardle H, John A, Dymond S, *et al.*: **Problem gambling and suicidality in England: secondary analysis of a representative cross-sectional survey.** *Public Health.* 2020.

[Publisher Full Text](#)

Wardle H, Moody A, Spence S, *et al.*: **British Gambling Prevalence Survey 2010.** Gambling Commission: Birmingham. 2011.

[Reference Source](#)

Wardle H, Reith G, Langham E, *et al.*: **Gambling and public health: we need policy action to prevent harm.** *BMJ.* 2019; 365: 11807.

[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)

Wills TA, Windle M, Cleary SD: **Temperament and novelty seeking in adolescent substance use: convergence of dimensions of temperament with constructs from Cloninger's theory.** *J Pers Soc Psychol.* 1998; 74(2): 387–406.

[PubMed Abstract](#) | [Publisher Full Text](#)



# Open Peer Review

Current Peer Review Status:  

---

## Version 1

Reviewer Report 23 June 2020

<https://doi.org/10.21956/wellcomeopenres.17513.r38835>

© 2020 Abbott M. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



### Max Abbott

Gambling and Addictions Research Centre, Faculty of Health and Environmental Sciences, Auckland University of Technology, Auckland, New Zealand

This paper provides an overview of a two-phase prospective survey of young adults resident in Great Britain. The primary focus is on gambling behaviours and changes in gambling behaviours, and relationships between these measures and a range of health and other factors. The baseline data collection phase has been completed.

The rationale for the study is well articulated and sound. The objectives are justified in terms of relevant background literature and developments in gambling availability and policy. Perhaps more specific hypotheses could have been stated a priori. If available, the introduction could be strengthened by inclusion of systemic and perhaps other recent reviews of youth gambling, especially reviews of prospective community surveys. Mention could have been made of the increasing convergence of gambling and gaming and its potential consequences for young people. In paragraph three mention is made of the finding of recent marked declines in some risk-taking behaviours among adolescents and young adults. Reference should also be made to general population studies that have found marked declines in gambling participation in this age group. Of further relevance is the finding that while participation has dropped markedly, problem and at-risk gambling has plateaued. Indeed in two studies, in Sweden and Australia, significant increases in problem/at-risk gambling accompanied substantial participation reductions. This pattern of low participation and high harm has been found in a number of other population groups that are recently exposed to more 'toxic' gambling forms and/or are highly vulnerable to gambling-related harm for other reasons. These findings raise important questions for the present study.

The study design is appropriate and the methodology is generally well described, while appropriate, as indicated by author, the sample is non-representative of the population of interest. While weighting may assist extreme caution will be required in generalising study findings beyond the sample investigated. Related to this, detail is lacking with respect to the number of panel members who were randomly selected and the proportion that accessed the survey page. While a surprisingly high 93% of people who accessed the page went on to complete

survey, what proportion of invitees accessed the page and what is the overall response rate? How representative are participants of the panellists selected and of the Great Britain youth population? The impact of COVID-19 will probably yield interesting and relevant information, while complicating interpretation of the findings. The analytic procedures are specified and appear to be appropriate for the study objectives and design. On this matter I would, however, probably defer to a biostatistician with extensive expertise in the analysis of prospective data. I am confident that dissemination of the findings will be well addressed and note that anonymised datasets will be made available for other investigators to access.

**Is the rationale for, and objectives of, the study clearly described?**

Yes

**Is the study design appropriate for the research question?**

Yes

**Are sufficient details of the methods provided to allow replication by others?**

Yes

**Are the datasets clearly presented in a useable and accessible format?**

Not applicable

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** I have decades of experience leading and contributing to general population and other studies of gambling and problem gambling/gambling harm. This includes leading large general population prospective gambling studies in a number of jurisdictions as well as clinical trials and mixed methods studies examining particular sociodemographic groups including young people, indigenous and migrant groups.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Reviewer Report 16 June 2020

<https://doi.org/10.21956/wellcomeopenres.17513.r38832>

© 2020 Volberg R. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



**Rachel Volberg** 

Department of Biostatistics and Epidemiology, University of Massachusetts, Amherst, MA, USA

The article describes the study protocol for a proposed second wave of data collection from a large cohort of young British adults (aged 16-24 at Wave 1) regarding a range of gambling behaviors and related harms. The aim is to understand changes in gambling behaviors and harms

over time among young adults and, additionally, obtain information about the impact of COVID-19 on the cohort members' gambling behaviors.

There is a clear rationale presented for the study. Young people in Britain are growing up in an environment where online gambling has always been freely available and heavily promoted. With no other experiential environment, it is unclear whether young people's gambling behaviors will reduce over time as has occurred among older adults whose gambling experience encompasses more tightly regulated environments. Furthermore, monitoring of gambling behaviors over time has typically been accomplished through repeat cross-sectional surveys which tend to identify stable patterns of behavior at the population level. These stable patterns mask a great deal of underlying liability in gambling behaviors and experiences of gambling harms. The specific objective of the study is to investigate the relationship between youth gambling behavior and use of various digital technologies with a focus on the determinants of gambling behavior, inequalities in such behavior, and factors associated with problem gambling among young Britons.

The study design appears appropriate and responsive to the specific objective of the study. The author specifies that Wave 1 was drawn from YouGov, which is a non-probability online panel with some issues of generalizability. The author anticipates a 32.5% attrition rate for final sample of ~2400. The Problem Gambling Severity Index was used to assess problem gambling at Wave 1 and is proposed again for Wave 2. While conventional scoring was used in Wave 1, it would be desirable to assess the impact of using a cutoff of 5+ on the PGSI since this aligns better with clinical assessments of problem gambling. The other measures described seem appropriate and all are chosen from existing validated measures.

The methods are described in some detail. It is unclear from the article whether any incentives were offered to the respondents in Wave 1 or are proposed in Wave 2 to potentially reduce attrition. With regard to data analysis, it would be helpful to look at gambling intensity (time and money spent gambling) as well as gambling involvement (number of types of gambling engaged with) when considering potentially confounding variables.

The data from both waves of the study will be deposited with the UK Data Archive at the end of the grant period. The author indicates that the data can be provided to other researchers upon request prior to the end of the grant period. There are no data associated with the article since this is a study protocol.

**Is the rationale for, and objectives of, the study clearly described?**

Yes

**Is the study design appropriate for the research question?**

Yes

**Are sufficient details of the methods provided to allow replication by others?**

Yes

**Are the datasets clearly presented in a useable and accessible format?**

Not applicable

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** Gambling epidemiology and etiology; social and economic impacts of gambling; problem gambling measurement

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

---

## Comments on this article

### Version 1

Reader Comment 08 Mar 2023

**Zulqarnain jabbar**, Azusa Pacific University, Azusa, USA

I have a question, do we consider [jackpot lottery](#) or other big lotteries as gambling?

**Competing Interests:** No competing interests were disclosed.

---