

# Secondary Analysis of Machines Data

Authors: David Excell & Piotr Grudzien

## Overview

A consortium of NatCen Social Research, Featurespace, Geofutures and RTI International conducted the Responsible Gambling Trust's (RGT) Machines Research Programme in 2014.

The research detailed data on player activity, gathered by gambling machines across the United Kingdom. An additional data set used was based on 4,000 players who took part in the survey from the Gambling Machines research project funded by the RGT in 2014. The survey contained all 9 questions from the Problem Gambling Severity Index, which labelled each player as a 'problem' or 'non-problem' gambler. The aim was to identify features and aspects of behaviour that are typical of problem gamblers. These features can be used as 'markers of harm' for identifying players.

The secondary analysis research was commissioned by the Responsible Gambling Trust to reuse the data asset that was created in the initial project to answer specific questions identified by the Responsible Gambling Strategy Board.

Featurespace was responsible for answering four of these questions. Our findings are provided below.

## Key findings

- Accuracy of the problem gambler identification model developed in the 2014 research was improved. Principally achieved by including new 'markers of harm' that measured the diversity on money loaded and money spent by the player.
- The most distinct identifiers of problem gamblers are their chaotic behaviours and that on average they seem more successful when playing.
- Transitions between B2 and B3 bets were not found to be useful when it came to differentiating between 'problem' and 'non-problem' gamblers.
- Players who place £100 bets are distributed uniformly across 'problem' and 'non-problem' gamblers within the surveyed data.

- A typical £100 stake scenario is one where players place the maximum bet several times during a session, it is rarely an isolated, single event. £100 stakes happen very rarely at initial stages of sessions and become more common at later stages.
- Variable and intensive activity at early stages of sessions often leads to £100 stakes being placed later.
- Differences between playing with winnings and with user's own money. In the former case players tend to bet higher amounts of money and withdraw money more often. In the latter case, players are loading money more often and spending more as a percentage of their balance.

---

## Chapter 1

### Research Question

- Can the range of linked data set variables be examined through 'reverse engineering' to explore whether any other variables play a useful role within the development of algorithms?

### Key findings

- The most informative aspects of player behaviour are diversity of money spent and money loaded (informative in conjunction with other features).
- Behaviour of problem gamblers is more chaotic. Diversity measures indicate they are less consistent with choice of stake level or amounts of money loaded.
- Problem gamblers tend to win more often, average returns on money spent are higher, and they have higher one-off losses.

### Conclusions

- Reverse engineering discovered that diversity features based on money loaded and money spent by the player play a useful role within the development of algorithms.
- The research found new insights into behavioural patterns that are indicative of problem gamblers. The most distinct being the chaotic behaviour of problem gamblers and that on average they seem more successful when playing. Their stakes or amounts of money spent and loaded take on more different values which span wider ranges of numbers. These general characteristics of problem gamblers are described in the report, along with

typical behavioural patterns that can be used as 'markers of harm'.

---

## Chapter 2

### Research Question

- What are the differences in demographics between B2/B3 players? What else can we learn about player's transitions between B2 and B3 content?

### Key findings

- On the game level, B2 and B3 differences are defined by the maximum allowed stake size (£100 for B2 and £2 for B3) and minimum time between stakes (20 seconds for B2 and 2 seconds for B3).
- On a player level, B2 and B3 players are categorised based on the prevalence of each category of bets.
- The concept of a 'hybrid' bet is introduced (a bet of more than £2 during a B3 game), together with an analysis of its properties and impact on player behaviour.

### Conclusions

- Transitions between B2 and B3 bets and the use of bets over £2 during B3 games were analysed. The research discovered that most aspects of transition-related player behaviour are not useful when it comes to differentiating between 'problem' and 'non-problem' gamblers. The standard deviation of the numbers of transitions per session and their average were two reasonably informative features.
- B2/B3 transitions are more likely to occur later on in a session – when the player has already placed a number of bets and, importantly, when they have tried a range of different stake sizes.

---

## Chapter 3

### Research Question

- What further descriptive data can be extracted about the £100 stake?

### Key findings

- Stakes of £100 are extremely rare – only accounting for 0.26% of all stakes (one in every 388 bets).
- 26% of all players surveyed have placed at least one maximum stake bet.
- Bets with £100 stakes are uniformly distributed across 'problem' and 'non-problem' gamblers.

However, in the subset of 310 players who have placed 100 or more £100 stakes they are slightly more likely to be problem gamblers than the surveyed population.

### Conclusions

- The research showed that a typical £100 stake scenario is one where players place the maximum bet several times during a session - it is rarely an isolated, single event. It was also found that £100 stakes happen very rarely at initial stages of sessions and become more common at later stages. It is the variable and intensive activity at early stages of sessions that often leads to £100 being placed later. They are usually preceded by gradually increasing stake sizes rather than appearing unexpectedly.

---

## Chapter 4

### Research Question

- What are the differences in behaviour when players are spending wins vs. loading their own new money into the machine?

### Key findings

- On average, players use 1.26 machines per shop visit.
- When playing with winnings, players on average load higher amounts of money into the machine.
- At later stages of sessions, players tend to wager lower stakes.
- At later stages of sessions, players tend to choose higher risk bets – ones for which the probability of winning is lower (a smaller proportion of such bets end in a win).

### Conclusions

- Separate analyses of player's behaviour when playing with winnings vs. with their own money have been conducted. They have shown how player's actions are heavily influenced by how much they have won compared to how much they have spent so far. Players play with winnings slightly more often at the beginning of sessions and then slowly lose money as sessions continue. They also tend to bet higher amounts of money and withdraw it more often. Players playing with their own money load money more often and spend more as a percentage of the current balance.