The use of behavioural tracking methodologies in the study of online gambling

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Contributor biography

Dr. Mark Griffiths is a Chartered Psychologist and Professor of Gambling Studies at the Nottingham Trent University, and Director of the International Gaming Research Unit. He has spent over 25 years in the field is internationally known for his work into gaming and gambling. He has published over 430 refereed research papers, three books, 100+ book chapters, and over 1000 other articles. He has served on numerous national and international committees and gambling charities (e.g. National Chair of GamCare, Society for the Study of Gambling, Gamblers Anonymous General Services Board, National Council on Gambling etc.). He has won 13 national and international awards for his work including the John Rosecrance Prize (1994), CELEJ Prize (1998), Joseph Lister Prize (2004) and the US National Council on Problem Gambling Research Award (2009). He also does a lot of freelance journalism and has appeared on over 2500 radio and television programmes. Dr Griffiths is an active blogger including his personal blog (http://drmarkgriffiths.wordpress.com) and one for Psychology Today (http://www.psychologytoday.com/experts/dr-mark-d-griffiths-phd).

Relevant disciplines

Psychology (and social sciences more generally)

Academic level

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Methods used

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Keywords

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Abstract

Online gambling is a psychological and sociological phenomenon that is becoming a focus of interest for an increasing number of researchers in the social sciences. At present, there are numerous different methods that can be used to collect data about

online gambling. However, this case study briefly examines one of the new methods that have been used in the last few years by those in the gambling studies field (i.e., behavioural tracking), and briefly reviews the advantages, disadvantages, and uses. When it comes to studying online gambling behaviour, behavioural tracking methodologies offer a number of advantages for researchers as they provide a totally objective account of what gamblers do online. However, it is also argued that no single methodology is better than another in the collection of data concerning online gamblers.

Learning Outcomes

This case provides an overview of behavioural tracking in online gambling and is designed:

- To give new researchers an understanding of the methodological issues concerned when collecting data online.

- To understand the advantages and disadvantages of using behavioural tracking particularly in relation to self-report surveys.

- To understand the way in which behavioural tracking tools can be used to potentially identify problem gamblers.

- To provide some specific examples of how behavioural tracking methodologies have been used to evaluate whether self-help tools for responsible gambling are effective.

Introduction

Online gambling is a psychological and sociological phenomenon that is becoming a focus of interest for an increasing number of researchers in the social sciences. As the

Internet offers a new venue for gambling, the risks for engaging in pathological behaviors are potentially increased (Griffiths, 2003). This has resulted in a large increase of empirical research into online gambling (Griffiths, 2011). At present, there are numerous different methods that can be used to collect data about online gambling. However, this case study briefly examines one of the new methods that have been used in the last few years by those in the gambling studies field (i.e., behavioural tracking), and briefly reviews the advantages, disadvantages, and uses.

The use of online methods to study gambling

Over the past decade, researchers in the gambling studies field have started to use online methods to gather their data, rather than traditional offline research approaches (Wood & Griffiths, 2007; Griffiths, 2010). Psychological research that can be done online includes correlational, cross-sectional, experimental, self-report, and/or observational research. A recent methodological review paper by Griffiths (2010) examined seven different online data collection methods used for collecting gambling and gaming data including (i) online questionnaires, (ii) online forums, (iii) online participant observation, (iv) online secondary data, (v) online interviews, (vi) online exemplar websites, and (vii) online evaluations (including online 'mystery shopping'). He also argued in the same paper that the internet can be a very useful medium for eliciting rich and detailed data in sensitive areas such as problem gambling.

There are a number of reasons why the online medium is a good place to conduct research with online gamblers. This is because the internet: (i) is usually accessible to these gamblers, and they are usually proficient in using it (Wood & Griffiths, 2007);

(ii) allows for studies to be administered to potentially large scale samples quickly and efficiently (Buchanan, 2000, 2007; Wood, Griffiths & Eatough, 2004); (iii) can facilitate automated data inputting allowing large scale samples to be administered at a fraction of the cost and time of 'pen and paper' equivalents (Buchanan, 2007); (iv) has a disinhibiting effect on users and reduces social desirability, leading to increased levels of honesty (and therefore higher validity in the case of self-report) (Joinson, Paine, Buchanan & Reips, 2008); (v) has a potentially global pool of participants, therefore researchers are able to study extreme and uncommon behaviours as well as make cross-cultural comparisons (Buchanan, 2000); (vi) provides access to 'socially unskilled' individuals who may not have taken part in the research if it was offline (Wood, et al 2004; Wood & Griffiths, 2007); (vii) can aid participant recruitment through advertising on various bulletin boards and websites (Wysocki, 1998); and (viii) can aid researchers because they do not have to be in the same geographical location as either the participants or fellow research colleagues (e.g., Whitty, 2004a; Wood, et al, 2004).

Online behavioural tracking in gambling

Over a decade ago, Griffiths and Parke (2002) noted that one of the most potentially worrying concerns about online gambling is the way online gambling website operators can collect data about their players (i.e., those who gamble on their websites). Customer data is the lifeblood of any company and online gamblers provide tracking data that can be used to compile customer profiles. Such data can tell commercial enterprises (such as those in the gambling industry) exactly how customers are spending their time in any given financial transaction (i.e., in the case of online gambling, which games their customers are gambling on, for how long, how

much money they are spending, what games are the profitable, etc.). This information can help in the retention of customers, and can also link up with existing customer databases and operating loyalty schemes. Companies who have one central repository for all their customer data have an advantage. It can also be accessed by different parts of the business. Many consumers are unknowingly passing on information about themselves, and are being profiled according to how they transact with service providers. Linked loyalty schemes can then track the account from the opening established date.

The technology to sift and assess vast amounts of customer information has developed substantially over the last decade. Using the latest sophisticated software, gaming companies can tailor their service to the customer's known interests. When it comes to gambling, there is a very fine line between providing what the customer wants and exploitation. The gaming industry sell products in much the same way that any other business sells things. They are now in the business of brand marketing, direct marketing (via mail with personalized and customized offers), and loyalty schemes (that create the illusion of awareness, recognition, and loyalty).

On joining loyalty schemes, players supply lots of information including name, address, telephone number, date of birth, and gender. Those who operate online gambling sites are no different. They know the gambler's favourite game and the amounts they have wagered. Basically they can track the playing patterns of any gambler. They arguably know more about the gambler's playing behaviour than the gamblers themselves. They are able to send the gambler offers and redemption vouchers, complimentary accounts, etc. These are done to enhance customer

experience (Griffiths & Wood, 2008a). Benefits and rewards to the customer can include cash, food and beverages, entertainment and general retail. However, more unscrupulous operators have the means to entice known problem gamblers back onto their premises with tailored freebies (such as the inducement of "free" bets in the case of internet gambling). However, later papers by Griffiths and colleagues began to argue that behavioural tracking data could potentially be used to help identify problem gamblers rather than exploit them, and to use behavioural tracking data for research purposes (Griffiths & Wood, 2008b; Griffiths, Wood, Parke & Parke, 2007).

The advantages and disadvantages of behavioural tracking methods in gambling research

There have been a number of different approaches to collecting data from and about gamblers. This has traditionally included self-report methods (surveys, focus groups, interviews, etc.), experiments (in the laboratory or in gambling venues), and participant and/or non-participant observation. Very recently (i.e., since around 2005), a number of researchers in the gambling studies field have been given direct access to gambling data collected by gaming companies from their commercial online gambling sites. These types of data (i.e., behavioural tracking data) are providing insights into gamblers' behaviour that is helping to better understand how such people act and behave online and over long periods of time.

There has been a much recent debate in the gambling studies field as to whether online gambling is more dangerous and harmful than offline gambling. Much of the debate has relied on the data collected by either behavioural tracking or survey methodologies. Griffiths and colleagues (Auer & Griffiths, 2013a; 2013b; Griffiths,

2009; Griffiths & Auer, 2011; Griffiths & Whitty, 2010) have written a number of papers outlining the key differences between these two methods. These can be summarized as follows:

- Behavioural tracking data provides a totally objective record of an individual's gambling behaviour on a particular online gambling website (whereas gamblers in self-report studies may be prone to social desirability factors, unreliable memory, etc.).

- Behavioural tracking data overcomes the problem of finding suitable online gambling participants as it provides an immediate data set (if access is granted by the gaming company). Participants do not even have to travel to participate in the study.

- Behavioural tracking data provide a record of events and can be revisited after the event itself has finished (whereas in general self-report studies cannot).

- Behavioural tracking data usually comprise very large sample sizes (e.g., studies by Auer and Griffiths [2013a; 2013b] have used databases of over 100,000 online gamblers) whereas self-report studies are based on much smaller sample sizes (e.g., the national *British Gambling Prevalence Surveys* typically comprise samples of around 8000-9000 people [e.g., Wardle, et al, 2011).

- Behavioural tracking data collects data from only one gambling site and tells us nothing about the person's Internet gambling in general as Internet gamblers typically gamble on more than one site (Wardle, et al, 2011).

- Behavioural tracking data always comes from unrepresentative samples (i.e., the players that use one particular internet gambling site) whereas the very

best self-report studies (e.g., the *British Gambling Prevalence Surveys* in Great Britain) use random and nationally representative samples (e.g., Wardle, et al, 2011).

- Behavioural tracking data does not account for the fact that more than one person can use a particular account.

- Behavioural tracking data tell us nothing about *why* people gamble (whereas self-report data can provide greater insight into motivation to gamble).

- Behavioural tracking data cannot be used for comparing online and offline gambling or for making comparisons about whether online gambling is safer or more dangerous than offline gambling as data are only collected on one group of people (i.e., online gamblers).

- Self-report methods can be used to compare two (or more) groups of gamblers and is the only method we currently have to infer to what extent one medium of gambling may or may not be more or less safe.

- Some self-report studies have the potential to use nationally representative samples of gamblers whereas behavioural tracking studies rely on self-selected samples of gamblers who use one specific online gambling website.

- Behavioural tracking data tell us nothing about the relationships between gambling and other behaviours (e.g. the relationship between gambling and alcohol or the relationship between gambling and tobacco use).

- Behavioural tracking data cannot examine problem gambling using current diagnostic criteria (whereas self-report studies can). In fact, behavioural tracking data studies cannot tell us anything about problem gambling as this is not a variable that has been examined in any of the published studies to date

(except by using proxy measures of problem gamblers, such as those people who exclude themselves from the site to prevent further gambling on it).

One team of researchers affiliated to Harvard University have been given access to a large behavioural tracking data set of over 47,000 online gamblers by the Austrian gaming company *bwin*. This has led to many papers examining the actual behaviour of online gamblers based on behavioural tracking data (e.g., Broda, LaPlante, Nelson, LaBrie, Bosworth & Shaffer, 2008; LaBrie, Kaplan, LaPlante, Nelson & Shaffer, 2008; LaBrie, LaPlante, Nelson, Schumann & Shaffer, 2007; LaPlante, Schumann, LaBrie & Shaffer, 2008; LaPlante, Kleschinsky, LaBrie, Nelson & Shaffer, 2009; Xuan & Shaffer, 2009). These data have been used to make claims along the lines that online gambling is no more problematic than offline gambling.

However, comparative statements relating to whether one medium of gambling is more problematic than another can only be made if actual gambling behaviour is studied across different forms of gambling (e.g., direct comparison of internet gambling with [say] land-based casino gambling). None of the various publications by the Harvard-affiliated research team have empirically compared different forms of gambling. Nor have they examined 'problem gambling' as no problem gambling screens were given to any online gambler included in their studies. Therefore, conclusions about the harmfulness of online gambling in comparison to other forms of gambling cannot be drawn from these particular studies using these types of behavioural tracking data. Furthermore, none of the publications focusing on online gambling examine overall gambling behaviour. All the publications have tended to examine a single type of game (e.g., sports betting, casino games, poker).

In contrast to behavioural tracking studies, a number of self-report empirical studies have reported that problem gambling is more prevalent among internet gamblers than non-internet gamblers (e.g., Ladd & Petry, 2003; Wood & Williams, 2007; Griffiths & Barnes, 2008). However, only two studies have compared Internet gamblers and non-Internet gamblers using a nationally representative sample. These was the secondary analyses of the 2007 *British Gambling Prevalence Survey*s (i.e., Griffiths, Wardle, Orford, Sproston & Erens, 2009; 2011; Wardle, et al, 2011). For instance, Griffiths, *et al* (2009; 2011) showed that the problem gambling prevalence rate using the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* criteria (DSM-IV; American Psychiatric Association, 2000) was significantly higher among Internet gamblers than non-Internet gamblers (5% versus 0.5%). However, there are many considerations to take into account. For instance, it may be that the medium of the Internet is a less protective environment for vulnerable players (e.g., problem gamblers).

More importantly, Wardle and Griffiths (2011) have asked what exactly is an 'online gambler'? Very few people only gamble online and most online gamblers also gamble offline (Griffiths et al, 2009). In the 2007 *British Gambling Prevalence Survey* (Wardle, Sproston, Orford, Erens, Griffiths, Constantine & Pigott, 2007) there were 476 people (out of 9,003 people who participated in the survey) who reported gambling online in the past year. Of these, only nine people did not report also participating in some kind of offline gambling activity. In other words, over 98% of online gamblers also gambled offline. These data suggest that 'pure' online gamblers (i.e., gamblers who gamble online and online only) are relatively rare.

According to the latest BGPS (Wardle, et al, 2011), the number of 'online only gamblers' had slightly increased to 2% but our data suggest there are a number of distinct ways to categorize gamblers based on the medium in which they gamble and what activities they gamble on in those mediums. The 2011 BGPS surveyed 7756 adult gamblers. Approximately one in seven respondents (14%) had gambled online in the past year (i.e., had gambled on at least one gambling activity such as gambling at online casinos and/or playing the lottery online). However, for the first time, four new groups of gamblers were created for comparison. These were those that:

- Gambled offline only (i.e., had gambled on at least one activity such as buying a lottery ticket in a shop or playing roulette at an offline casino but hadn't gambled online in the past year).
- Gambled online only (i.e., had gambled on at least one activity such as gambling on a betting exchange or gambling at an online casino but hadn't gambled offline in the past year).
- Gambled both online and offline but on different activities (i.e., had gambled on at least one activity online and one activity offline but were different activities such as gambling on a slot machine in an amusement arcade and playing blackjack in an online casino).
- Gambled both online and offline but on the same activities (i.e., had gambled on at least one activity both online and offline such as gambling at both an online and offline casino).

Perhaps unsurprisingly, of all gamblers, the largest group was those who only

gambled offline only (80.5%) and the smallest group was those who gambled online only (2.1%). Of far more interest were the rates of problem gambling among these four groups. The highest prevalence rates of problem gambling were amongst mixed mode gamblers who gambled on different activities (4.3%), followed by mixed mode gamblers who gambled on the same activities (2.4%), those who only gambled offline (0.9%), and those who only gambled online (0%). The most interesting statistic is arguably the fact that there was not a single case of problem or pathological gambling among those gamblers who only gambled online. Extreme caution must be given as the player base for 'online only' gamblers is very small when compared to the other groups. However, this certainly opens up an area for future research as to whether those who only gamble online are more resilient to developing gambling problems than those who engage in mixed modes of gambling.

The more refined analysis carried out using the latest BGPS data demonstrates that direct comparisons between online and land-based gamblers typically ignores the more complex nature of how people gamble in and across different media and gambling activities. However, these secondary analyses demonstrate that these very basic distinctions, using the mode and type of gambling as the primary discriminators, produces a wide range of gambling sub-types for future analysis and demonstrates that the concept of 'online gambler' isn't homogenous.

However, the incidence of 'online only gamblers' may increase over time as 'digital natives' (the so-called 'screenagers') who have never known life without the internet and spend most of their leisure time online, get older (King, Delfabbro & Griffiths, 2010; Griffiths & Parke, 2010). The limited data (to date) suggest that it is not the

medium of gambling that is more problematic *per se*, but that to vulnerable people (e.g., problem gamblers), the internet may be providing easily accessible 'convenience' gambling that perhaps explains why problem gambling prevalence rates among online gamblers appear to be much higher than non-online gamblers.

Behavioural tracking tools

Over the past few years, innovative social responsibility tools that track player behaviour with the aim of preventing problem gambling have been developed including *PlayScan* – developed by the Swedish gaming company *Svenska Spel*, *Observer* – developed by Israeli gaming company *888.com* and *mentor* – developed by *neccton Ltd* (Griffiths, Wood, Parke & Parke, 2007; Griffiths, Wood & Parke, 2009). These new tools are providing insights about problematic gambling behaviour that in turn may lead to new avenues for future research in the area. The companies who have developed these tools claim that they can detect problematic gambling behaviour through analysis of behavioural tracking data (Griffiths, Wood & Parke, 2009). If problem gambling can be detected online via observational tracking data, it suggests that there are identifiable behaviours associated with online problem gambling. Given that almost all of the current validated problem gambling screens diagnose problem gambling based on many of the consequences of problem gambling (e.g., compromising job, education, hobbies and/or relationship because of gambling; committing criminal acts to fund gambling behaviour; lying to family and friends about the extent of gambling, etc.), behavioural tracking data appears to suggest that problem gambling can be identified without the need to assess the negative psychosocial consequences of problem gambling.

Behavioural tracking tools generally use a combination of behavioural science, psychology, mathematics, and artificial intelligence. Some tools (such as *PlayScan*) claim to detect players at risk of developing gambling problems, and offer the gamblers ways to help change their behaviour (e.g., tools that help gamblers set time and money limits on what they are prepared to lose over predetermined time periods). Unlike the conventional purpose of customer databases (i.e., to increase sales), the objective of these new tools is the opposite. They are designed to detect and help those who would benefit from playing less. Such tools have been compared to a safety belt (i.e., something you use without intending to actually make use of). The use of these systems is voluntary, but the gaming operator strongly recommends its customers to use it (Griffiths, Wood & Parke, 2009). These tools use many parameters from the player's behaviour from the preceding year that is then matched against a model based on behavioural characteristics for problem players. If it predicts players' behaviour as risky they get an advance warning together with advice on how they can change their patterns in order to avoid future unhealthy and/or risky gambling. Behavioural tracking data can also be used to evaluate whether the tools and advice given to gamblers can actually change (i.e., reduce) potentially problematic behaviour.

For instance, a study by Auer and Griffiths (2013a) used behavioural tracking data to evaluate whether the setting of voluntary time and money limits helped players who gambled the most. Data were collected from a representative random sample of 100,000 online players who gambled on the *win2day* gambling website during a three-month test period. This sample comprised 5,000 registered gamblers who chose to set themselves limits while playing on *win2day*. During the registration process,

there is a mandatory requirement for all players to set time and cash-in limits. For instance, the player can limit the daily, weekly and/or monthly cash-in amount and the playing duration. The latter can be limited per playing session and/or per day. In the three-month test period, all voluntary limit setting behaviour by online gamblers was tracked and recorded for subsequent data analysis. Changes in gambling behaviour were analysed overall and separately for casino, lottery and poker gambling.

The results of this study clearly showed that voluntary limit setting had a specific and statistically significant effect on high intensity gamblers (i.e., voluntary limit setting had the largest effect on the most gaming intense players). More specifically, the analysis showed that (in general) gaming intense players specifically changed their behaviour in a positive way after they limited themselves with respect to both time and money spent. Voluntary spending limits had the highest significant effect on subsequent monetary spending among casino and lottery gamblers. Monetary spending among poker players significantly decreased after setting a voluntary time limit. Studies such as this highlight the advantageous way in which behavioural tracking methodologies can be used to provide results and insights that would be highly difficult to show using other more traditional methodologies.

Conclusions

This case study has highlighted that when it comes to studying online gambling behaviour, behavioural tracking methodologies offer a number of advantages for researchers. However, it was also argued that there are a number of disadvantages when compared to other more traditional research methods (i.e., surveys), and that no single methodology is better than another in the collection of data concerning online

gamblers. However, when evaluating the results of studies that make statements about whether one medium of gambling is more problematic to gamblers than another, the inherent strengths and weaknesses of the methodology used must be taken into consideration. It was also argued that there are some types of study (e.g., the evaluation of whether social responsibility tools actually have an effect on subsequent player behaviour) where behavioural tracking methodologies appear to be the only reliable way of collecting data to show that specific interventions have a direct effect on player behaviour.

Exercises and Discussion Questions

- What advantages do online behavioural tracking methods have over other forms of online data collection?

- What kinds of ethical issues are involved in the use of behavioural tracking data? Where does the distinction between public and private space lie?

- To what extent is the use of behavioural tracking data an invasion of people's privacy?

- How might behavioural tracking methodologies be used to collect data on other types of human behaviour? What would be the advantages and disadvantages of using such methods on behaviours other than online gambling?

Further Readings

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