Most people reading this will be aware that in-play betting (also known as ‘live action’ betting or ‘in-running’ betting) refers to the wagering on an event that has started but not yet finished. Here, gamblers have the option to continue to bet once an event has started, and adapt their bets depending on how the event is progressing (e.g., on a sporting event such as a football or cricket match).

In-play betting first appeared towards the end of the 1990s when some bookmakers would take bets over the telephone while a sports event was in progress, and has now evolved into a popular online service in many countries. For example, in the UK, up to 25% of online gamblers have placed a bet in-play (Gambling Commission, 2016). The introduction of in-play betting has allowed bookmakers to increase the number of markets available to bet on during sports events, and gamblers are able to place bets based on many different types of in-game activity during the matches. For example, in football matches it is possible to bet in on in-play markets including the match result, half-time score, number of goals scored in the first or second half of the game, the number of yellow cards during the match, and the name of the goal scorers, etc. The availability of a particular sport and in-play markets varies from bookmaker to bookmaker.

Researchers have previously referred to the role of structural characteristics in the acquisition, maintenance and development of online gambling behaviours (Parke & Griffiths, 2007). Structural characteristics are those features that are inherent within the game itself and include features that are responsible for reinforcement and may in some cases facilitate excessive gambling (Griffiths et al. 2006). These characteristics include, but are not limited to, bet frequency (the number of bets placed within a given time frame), event frequency (the number of
In-play sports betting has structural characteristics that have changed the mechanics of gambling for sports bettors, as they are now able to place a larger number of bets during a single sports game...
In-play bettors who were categorized by high-intensity, frequency and variability of amount staked during their first month of gambling were more likely to report gambling-related problems when closing their accounts. Two groups of internet gamblers were found to have a higher risk of developing gambling-related problems. The first group engaged in three or more different gambling activities and showed high wager variability on casino games in their first month of using the gambling website. The second group participated in two different gambling activities and demonstrated high variability for in-play wagers. Bettors who surpassed a self-imposed or default limit demonstrated a higher involvement in sports betting (i.e., bets per day and stake size). After receiving the notification, indicators of unfavourable gambling behaviours did not decline. There were no reported differences in the betting patterns of results for fixed-odds and in-play betting. Gambling involvement levels, including gambling on multiple game types, were predictive of gambling-related problems. Engaging in in-play betting or poker were significant predictors of at-risk gambling after controlling for multiple game involvement. Online gamblers who triggered a responsible gambling alert were distinguished from control cases using indices of the intensity of gambling activity (e.g., number of bets per betting day, total number of bets made). Those who triggered the responsible gambling alert were likely to engage in in-play sports betting than those who did not. The paper argued that structural characteristics, including event frequency, appear to be a contributing factor in problem gambling. It was argued that in-play betting had changed the structural characteristics of sports betting from one that was typically discontinuous (e.g., a weekly bet on the outcome of a football game) to a ‘continuous’ form of gambling with an increased event frequency that is associated with problem gambling. The risk of experiencing gambling-related problems was associated with a higher number of bets being placed in-play, before an event has started; and on impulse before or during a match. Impulsive sports bettors (characterised as having higher trait impulsiveness, more frequent sports betting behaviour, higher problem gambling severity and a shorter history of sports betting) were more likely to bet on in-play sporting events than overall match outcomes.

Table 1: Academic papers that discuss or empirically studied in-play sports betting (in alphabetical order of first author)

<table>
<thead>
<tr>
<th>STUDY/PAPER</th>
<th>METHODOLOGY</th>
<th>SAMPLE SIZE</th>
<th>MAIN FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braverman and Shaffer (2010)</td>
<td>Behavioural tracking</td>
<td>530</td>
<td>In-play bettors who were categorized by high-intensity, frequency and variability of amount staked during their first month of gambling were more likely to report gambling-related problems when closing their accounts.</td>
</tr>
<tr>
<td>Braverman et al. (2013)</td>
<td>Behavioural tracking</td>
<td>4,056</td>
<td>Two groups of internet gamblers were found to have a higher risk of developing gambling-related problems. The first group engaged in three of more different gambling activities and showed high wager variability on casino games in their first month of using the gambling website. The second group participated in two different gambling activities and demonstrated high variability for in-play wagers.</td>
</tr>
<tr>
<td>Broda et al. (2008)</td>
<td>Behavioural tracking</td>
<td>160</td>
<td>Bettors who surpassed a self-imposed or default limit demonstrated a higher involvement in sports betting (i.e., bets per day and stake size). After receiving the notification, indicators of unfavourable gambling behaviours did not decline. There were no reported differences in the betting patterns of results for fixed-odds and in-play betting.</td>
</tr>
<tr>
<td>Brosowski, Meyer &amp; Hayer (2008)</td>
<td>Behavioural tracking</td>
<td>27,653</td>
<td>Gambling involvement levels, including gambling on multiple game types, were predictive of gambling-related problems. Engaging in in-play betting or poker were significant predictors of at-risk gambling after controlling for multiple game involvement.</td>
</tr>
<tr>
<td>Gray et al. (2012)</td>
<td>Behavioural tracking</td>
<td>2,066</td>
<td>Online gamblers who triggered a responsible gambling alert were distinguished from control cases using indices of the intensity of gambling activity (e.g., number of bets per betting day, total number of bets made). Those who triggered the responsible gambling alert were likely to engage in in-play sports betting than those who did not.</td>
</tr>
<tr>
<td>Griffiths and Auer (2013)</td>
<td>Theoretical</td>
<td>N/A</td>
<td>The paper argued that structural characteristics, including event frequency, appear to be a contributing factor in problem gambling. It was argued that in-play betting had changed the structural characteristics of sports betting from one that was typically discontinuous (e.g., a weekly bet on the outcome of a football game) to a ‘continuous’ form of gambling with an increased event frequency that is associated with problem gambling.</td>
</tr>
<tr>
<td>Hing et al. (2016)</td>
<td>Self-report</td>
<td>639</td>
<td>The risk of experiencing gambling-related problems was associated with a higher number of bets being placed in-play, before an event has started; and on impulse before or during a match.</td>
</tr>
<tr>
<td>Hing et al. (2017)</td>
<td>Self-report</td>
<td>1,816</td>
<td>Impulsive sports bettors (characterised as having higher trait impulsiveness, more frequent sports betting behaviour, higher problem gambling severity and a shorter history of sports betting) were more likely to bet on in-play sporting events than overall match outcomes.</td>
</tr>
</tbody>
</table>
### STUDY/PAPER METHODOLOGY SAMPLE SIZE MAIN FINDINGS

<table>
<thead>
<tr>
<th>STUDY/PAPER</th>
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<th>SAMPLE SIZE</th>
<th>MAIN FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LaBrie et al. (2007)</td>
<td>Behavioural tracking</td>
<td>40,499</td>
<td>In-play bettors placed on average 2.8 wagers of €4 every fourth day compared with fixed-odds bettors who placed 2.5 bets of €4 every fourth day. Mean net losses were smaller for in-play bets. Those who bet in-play on sports (as opposed to those who bet before matches) were categorized more often as heavily involved gamblers.</td>
</tr>
<tr>
<td>LaPlante et al. (2008)</td>
<td>Behavioural tracking</td>
<td>47,603</td>
<td>Most of the sample demonstrated a rapid decrease in the number of bets made and the stake size wagered. Betting frequency was higher for fixed-odds events. However, after three months, the amount wagered on in-play events surpassed wagers placed on fixed-odds events.</td>
</tr>
<tr>
<td>LaPlante et al. (2014)</td>
<td>Self-report</td>
<td>1,440</td>
<td>In-play sports betting demonstrated a significant relationship with potential gambling-related problems, after controlling for depth and breadth of gambling involvement.</td>
</tr>
<tr>
<td>Lopez-Gonzalez and Griffiths (2017)</td>
<td>Theoretical</td>
<td>N/A</td>
<td>It was theorised that the in-play ‘cash-out’ feature has structural characteristics that allows bettors to feel more in control of their bets and may make gamblers lose control of their bets.</td>
</tr>
<tr>
<td>Lopez-Gonzalez and Griffiths (2018)</td>
<td>Self-report</td>
<td>659</td>
<td>Problem gambling severity was positively associated with (i) how much gamblers talked about betting with other people prior to bet placement, and (ii) how often online betting functions such as ‘cash out’ were utilized and time spent betting. In-play sports betting was found to be more prevalent among problem gamblers when compared to moderate-risk gamblers, low-risk gambler and non-problem gamblers.</td>
</tr>
<tr>
<td>Nelson et al. (2008)</td>
<td>Behavioural tracking</td>
<td>567</td>
<td>Bettors who utilised a self-limit (SL) feature were more likely to prefer in-play betting on match outcomes opposed to betting on fixed-odds events. Bettors who used the SL feature placed more bets per day but wagered less money per bet on in-play betting than non-SL players. After utilising the SL feature, subscribers reduced gambling activity. However, for sports-betting gamblers. The frequency, amount and percentage-loss of wagers did not change.</td>
</tr>
<tr>
<td>Parke and Griffiths (2007)</td>
<td>Theoretical</td>
<td>N/A</td>
<td>It was theorised that because of the change in structural characteristics that in-play gambling provided that in-play betting may contribute to problem gambling because of (i) an increase in perceived skill, (ii) within-session chasing on the same match or event, and (iii) by making the sporting events more interesting and/or exciting.</td>
</tr>
<tr>
<td>Xuan and Shaffer (2009)</td>
<td>Behavioural tracking</td>
<td>226</td>
<td>Prior to closing their gambling accounts, self-identified in-play betting problem gamblers, whilst experiencing increasing losses, were more likely to try to recoup their losses by increasing their stake per bets on events that had less risky (i.e., shorter) odds. A decrease in gambling frequency in-play problem bettors was observed prior to account closure.</td>
</tr>
</tbody>
</table>
As can be seen from this brief review, the most commonly used empirical method of investigating in-play gambling behaviours has been via the use of behavioural tracking data...


minute on an online slot machine) tend to have a much higher association with problem gambling than activities such as a bi-weekly lotto game (with an event frequency of twice a week) (Griffiths & Auer, 2013). In relation to in-play-betting, Parke and Griffiths (2007) were the first scholars to speculate that in-play betting may contribute to prolonged, excessive, un-planned, or problem gambling due to: (i) a growth in ‘perceived skill’ (through studying, analysing or spectating the betting event); (ii) chasing losses/winnings on the same or different sporting event by placing further bets during the event; and (iii) by making the sporting event more stimulating or exciting.

Papers by Griffiths and Auer (2013) and Lopez-Gonzalez and Griffiths (2017) made a number of similar observations. Previously, bet duration (the time from placing the bet, until its settlement) was fixed. However, bet durations can now be amended via in-play ‘cash out’ features (Lopez-Gonzalez & Griffiths, 2017). In-play betting utilising ‘cash out’ features have the potential to make sports-bettors more vulnerable to cognitive bias (Lopez-Gonzalez & Griffiths, 2017). In the past, sports betting was typically a discontinuous form of gambling with the vast majority of sports bettors gambling weekly on the outcome of a particular event (e.g., a football match). However, some papers have specifically argued that in-play betting and use of the ‘cash out’ feature now allows sports betting to be a continuous form of gambling (Griffiths & Auer, 2013; Lopez-Gonzalez & Griffiths, 2017). This has radically changed the traditional sports betting market which was once a discontinuous (low-risk) gambling activity to a more continuous (high-risk) gambling activity. In-play sports bettors who experience gambling-related problems may feel more inclined to engage in less planned, impulsive, and immediate forms of gambling and the time between bet placement and the reward (or lack of) is greatly shortened (Parke & Griffiths, 2007; Griffiths & Auer, 2013).

A paper published by Lopez-Gonzalez and Griffiths (2017) is the only paper that explicitly discusses the implication of in-play ‘cash out’ sports betting features. They suggested that one of the implications of ‘cash out’ in relation to problem gambling is that there is a conception of gambling on sports as an investment, like that of trading on the stock market. This was then confirmed empirically showing that sports betting advertisements contribute to self-perceptions of bettors as specialists of sports, promoting game analysis to beat gambling companies (Lopez-Gonzalez, Guerrero-Solé, Estévez & Griffiths, 2017). The notion that the bettor can view themselves as a professional that can improve their probability of winning may serve as a motivating factor to gamble (Lopez-Gonzalez & Griffiths, 2017). Problematic online bettors have been found to consider themselves to be semi-professional gambler, and in the case of horse racing bettors, they are more likely to self-report being a professional gambler (Hing, Russell & Browne, 2017).

So what do these studies tell us?

As can be seen from this brief review, the most commonly used empirical method of investigating in-play gambling behaviours has been via the use of behavioural tracking data (although all of this has come from the same bwin dataset). Research published using the bwin dataset has reported that engaging in in-play gambling appears to be an important marker for gambling-related problems (LaBrie et al. 2007; LaPlante et al. 2008; Nelson et al. 2008). These studies described gambling-related behavioural factors associated with highly involved sports bettors (e.g., number of bets and the total amount wagered) and identified a sub-group of bettors who maintained a high involvement in online gambling via in-play betting (LaBrie et al 2007; LaPlante et al. 2008). Other studies found that participation in in-play sports betting is an independent predictor of problem gambling severity when gambling involvement is controlled for (Brosowski, Meyer & Hayer. 2008; Xuan & Shaffer, 2009). It was also found that gamblers who utilised an online provider’s limit setting tool were more likely to engage in in-play betting than other forms of gambling (Gray et al. 2012; Nelson et al. 2008). After setting a voluntary limit, those who previously participated in fixed-odds and in-play sports betting were more likely to stop betting in-play than to stop betting on fixed-odds selections (Nelson et al. 2008). Nelson et al. (2008) suggest that this could indicate that the players consider in-play betting to be more of a risk. Overall, the reviewed studies suggest that multiple, frequent and larger in-play bets appeared likely indicators that differentiated high-risk sports bettors from lower risk sports bettors.

Although the results described using the bwin dataset allow for real life gambling behaviour to be studied, they are not without limitations. Firstly, studies that utilise these datasets did not describe the gamblers’ perceptions, clinical characteristics or the social consequences associated with their betting behaviour (Griffiths, 2014; Shaffer et al. 2010). There was no information provided about users’ income (Shaffer et al. 2010) and previous research has indicated that the impact of gambling is partially dependent upon the gambler’s financial status, therefore, it is necessary to consider the amount spent gambling in relation to the amount of money that is available (Gray et al. 2012). Due the lack of psychosocial information about the meaning and consequences of gamblers, it is not possible to infer any clinical
characteristics regarding the impact of internet gambling on the lives of individual subscribers (Griffiths, 2014; Shaffer et al. 2010). One disadvantage of using online behavioural tracking is that internet gamblers may also gamble both online and in person, for example, at casinos or other gambling venues, and are unlikely to gamble at just one site (Wardle et al., 2011). Therefore, estimates of Internet gambling usage may not be an accurate representation of how much Internet subscribers gamble (Shaffer et al. 2010).

In relation to the self-report studies and non-empirical studies concerning in-play sports betting, researchers have constantly referred to the role of structural characteristics in the acquisition, maintenance and development of online gambling behaviour (Parke & Griffiths, 2007) and have demonstrated an association between problem gambling and such features as event frequency, bet frequency, and the speed of rewards (Griffiths, 2012; Harris & Griffiths, 2017). The gambling studies literature has suggested that in-play sports betting may offer more of a risk to problem gamblers because it allows the option for high-speed continuous betting and requires rapid and impulsive decisions in absence of time for reflection (Hing et al. 2014a, 2014b; Lopez-Gonzalez et al., 2017; Nelson et al. 2008). Therefore, in relation to problem gambling, in-play betting offers structural factors that may contribute to the development of gambling-related problems. These characteristics include, but are not limited to bet frequency, event frequency, event duration, and pay-out frequency.

Research has found in-play betting to be associated with people who were categorised as problem gamblers (Lopez-Gonzalez and Griffiths, 2018). Lopez-Gonzalez and Griffiths (2018) offered a potential explanation for this. More specifically, gamblers who are experiencing gambling-related problems may be inclined to place impulsive, less planned, and readily available bets (Parke & Griffiths, 2007) and have demonstrated an association between problem gambling and the use of different gambling types due to the correlational and cross-sectional nature of the few studies that have been carried out to date (Lopez-Gonzalez and Griffiths, 2018). Understanding factors that determine in-play betting behaviour, including understanding the risk factors for problem gambling amongst in-play sports bettors, is an important area of research given the continuing growth of the online sports betting industry. Overall, research to date suggests that this way of gambling has the potential to be more harmful than other ways of gambling (e.g., gambling on fixed odds) because of the inherent structural characteristics.

References


I N- P L A Y B E T T I N G  

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Elizabeth Killick is a doctoral research student of Professor Griffiths at Nottingham Trent University (UK) and is currently writing her PhD thesis on marketing practices in sports betting.