

# Sports-Embedded Gambling Promotions: A Study of Exposure, Sports Betting Intention and Problem Gambling Amongst Adults

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Published online: 25 November 2014  
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**Abstract** Community, media and government concerns have emerged about promoting sports betting during televised sports broadcasts, which now contain betting operators' logos, signage, websites, commentary and betting odds. Despite large television audiences being exposed, limited research has examined how these promotions shape gambling behaviour, particularly amongst problem gamblers. Underpinned by the Theory of Reasoned Action, this study explored whether exposure and attitude to gambling promotions during televised sport predict sports betting intention and whether this relationship varies with problem gambling severity. Surveys were conducted with 1,000 adults in Queensland, Australia. Strongest predictors of greater intended frequency of sports betting were higher problem gambling severity, previous sports betting participation, more frequent exposure to the promotions, and more positive attitudes towards them. Results suggest that the audience most likely to be stimulated by these promotions are problem gamblers because they have greatest exposure and a favourable disposition to them, and report they have maintained or worsened their problem sports betting behaviours. Policy and public health interventions may be needed to counter these pervasive media messages.

**Keywords** Gambling · Sports betting · Sport · Promotions · Advertising · Media · Exposure

Theoretical models of social learning (Bandura 1977), exposure effects (Bornstein 1989; Petty and Cacioppo 1986; McGuire 1985; Zajonc 1968), and cultivation processes (Gerbner et al. 1994) support the notion that media exposure shapes behaviour. Research has provided increasing evidence that the media influence how individuals make decisions; consequently the persuasive effects of media messages have been cause for concern when they are thought to cultivate unhealthy behaviours (Brown and Walsh-Childers 2002). While it has long been

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recognised that tobacco and alcohol advertising can have deleterious effects, another widely advertised product of growing public health concern is gambling.

Gambling is a popular activity in most countries (Reith 2007), with gambling behaviour conceptualized on a continuum, from recreational gambling through to at-risk and problem gambling (Shaffer & Korn 2002; Productivity Commission 1999). Depending on the jurisdiction and year, past year problem gambling prevalence ranges from 0.5 to 7.6 % of the adult population (Williams et al. 2012a), while at-risk gambling, experienced by 10–15 % of adults, is also associated with some negative consequences for individuals, their families and communities (Productivity Commission 2010).

While gambling advertising is increasingly conducted through newer channels such as the Internet and social media (Binde 2014), a recent phenomenon utilising traditional media has been the embedding of gambling advertising into televised sports broadcasts in countries including Australia, New Zealand and Canada (Friend and Ladd 2009; Korn et al. 2005; Lamont et al. 2011; Maher et al. 2006; McMullan 2011; Milner et al. 2013; Monaghan et al. 2008). Numerous gambling operators, particularly those offering sports betting, have negotiated commercial arrangements to promote greater brand awareness through corporate sponsorship of sports governing bodies, competitions, teams, events and stadia, and through purchasing advertising during sports telecasts (Horn 2011; Joint Select Committee on Gambling Reform [JSCGR], 2011; Lamont et al. 2011; Milner et al. 2013; Thomas et al. 2012a). Consequently, along with paid advertising in commercial breaks, a wide range of gambling promotional techniques are now integrated into sports telecasts. These include on-screen displays of sports betting logos and websites, stadium signage, sponsored segments, logos on player uniforms, and celebrity endorsement of gambling brands (Milner et al. 2013; Thomas et al. 2012b). Other promotional techniques have included the integration of live betting odds discussions into match commentary and promotion of match-specific novelty and exotic bets, accompanied by on-screen displays of changing odds and live studio cross-overs to sports betting operators (Milner et al. 2013; Thomas et al. 2012b).<sup>1</sup> Thus, large viewing audiences for televised sporting events are routinely exposed to these promotions when watching televised sport on both free-to-air and Pay TV.

Amongst all media types, television remains the primary source of socialization, nurturing observational learning through the images, values and ideologies portrayed which may bring about attitudinal and behavioural change (Bandura 1977; Gerbner et al. 1992; Gonzalez-Mena 2012; Kubey and Csikszentmihalyi 2013). However, consumer socialization through social media is growing although its overall relative affect compared to television is not yet certain (O’Keeffe and Clarke-Pearson 2011; Wang et al. 2012). Given the proliferation of gambling promotions during televised sport and the large television audiences exposed to these promotions, it is important to examine their role in shaping gambling behaviour, particularly amongst problem gamblers.

However, only three empirical studies have investigated the influence of sports-embedded betting promotions on gambling and gambling problems. While these studies have conducted qualitative research into community attitudes to these promotions (Thomas et al. 2012b) and surveyed their influence on university students’ and adolescents’ gambling intentions (Hing et al. 2014c; Hing et al. 2013), none have examined their relationship with gambling and

<sup>1</sup> ‘Exotic betting’ involves placing bets, either before or during a match, on individual events and contingencies within a match, such as number of goals scored, points won or penalties awarded, with these exotic bets sometimes relating to particular players, teams or time periods (e.g., the first set of a tennis match) (JSCGR, 2011). Bookmakers can also offer ‘novelty bets’. These include bets made available to a limited number of people (e.g., to the first 100 callers), for a limited time (e.g., for the next five minutes), or with a conditional money-back guarantee (e.g., the team backed loses by ten points or less).

problem gambling amongst a general adult population. Thus, the aim of the current study was to explore whether exposure and attitude to gambling promotions during televised sport interact with sports betting intention amongst adults and whether this relationship varies according to problem gambling severity. An extended adaptation of the Theory of Reasoned Action (TRA; Fishbein 1967; Fishbein and Ajzen 1975) was employed. Of central interest was whether exposure and attitude to gambling promotions during televised sport provide additional value in explaining sports betting intention, beyond what might be explained by the TRA.

While longitudinal studies are needed to unravel causal pathways, the current study provides some preliminary knowledge about how adults interact with these promotions. In reviewing the limited gambling advertising literature, Binde (2014) notes that comparative research that explores attitudes, perceptions and self-rated impacts of gambling advertising is of high priority. This is because it can provide insights into how advertising messages are perceived and understood and the types of advertising that might impact negatively on vulnerable groups such as at-risk and problem gamblers. The current study is a modest but important start to understanding how sports-embedded gambling promotions are differentially received by adults with varying levels of problem gambling severity. By examining these differential effects, the paper lays some groundwork for future research that can explain how and why these effects may occur.

### **Influence of Gambling Advertising on Gambling and Problem Gambling Behaviour**

Quantitative research with adults has found that problem gamblers report more stimulation to gamble from gambling advertisements compared to non-problem gamblers. In a study of 100 Australian adults, problem gamblers reported a larger influence on spending more than intended, compared to non-problem gamblers, for some gambling forms and some gambling slogans (Schottler, 2012). A New Zealand study found higher agreement amongst problem gamblers than non-problem gamblers that gambling advertising encouraged them to think they could win, although large differences were found amongst different ethnic groups (Clarke et al. 2006, 2007). Binde (2014) reports that studies in Sweden (Jonsson et al. 2003), Denmark (Bonke 2007) and Hong Kong (Hoa et al. 2012), along with a study of Internet gamblers (McCormack et al. 2013) have all indicated more self-reported influence of gambling advertising on problem compared to non-problem gamblers.

Other quantitative studies have examined whether gambling advertising triggers gambling urges. Amongst 365 self-selected female gamblers in Ontario, 20 % reported that gambling advertising had aroused urges to gamble (Boughton and Brewster 2002). Grant and Kim (2001) found that 46 % of the 131 pathological gamblers in their sample reported that television, radio and billboard advertisements had triggered their gambling. These studies suggest that problem gamblers report greater impact of gambling advertising than do non-problem gamblers, but that this effect may vary according to type of gambling, type of advertising and personal characteristics.

Similar results have been obtained in studies of youth, with youth problem gamblers reporting heightened likelihood of gambling on sports and lotteries if they had seen related advertisements (Korn et al. 2005). Derevensky et al. (2010) found that youth with high vulnerability for problem gambling were more likely to report sometimes or often gambling after seeing an advertisement. Felsher et al. (2004a, 2004b) found higher reported likelihood of purchasing lottery tickets in response to advertising amongst youth problem, compared to non-problem, gamblers. Derevensky et al. (2010) concluded that, while gambling advertising may

not motivate young people to commence gambling, it is especially detrimental for problem gamblers as it serves to maintain established gambling patterns. Similar conclusions have been reached in relation to adult problem gamblers (Binde 2007, 2009; Hing et al. 2014a). Gambling advertising may also contribute to new cases of problem gambling by shifting non-problem gamblers along the gambling continuum (Binde 2014), because any feature increasing consumption heightens risks of gambling-related harm (Currie et al. 2006, 2008; Rockloff 2012).

Qualitative research has provided insights into why gambling advertising impacts negatively on problem gamblers. Both Binde (2009) and Hing et al. (2014a) found that gambling advertisements and promotions remind some problem gamblers about gambling, trigger gambling urges, provide inducements to gamble, further increase gambling involvement, and undermine decisions to moderate gambling. For example, Hing et al. (2014a) found that some treatment-seeking problem gamblers in their study reported increased gambling, particularly associated with bonus offers from Internet sports betting operators that required matching deposits. These gamblers also reported that advertisements aroused urges to gamble and appeared to target them after they had taken steps to limit or cease gambling.

Sports-embedded gambling promotions may pose risks for young men in particular as they are the clear target market (Korn et al. 2005; Milner et al. 2013; Thomas et al. 2012b). Many young adult males find sports betting promotions unavoidable, unnecessary and aggressive, sending a dangerous message about the social acceptance of gambling and its 'normalised relationship with being a sports fan' (Thomas et al. 2012b, p. 121). In Thomas et al. (2012b) qualitative study, young males described how sports betting odds were now embedded in peer discussions and that they felt pressured to gamble to avoid isolation from peers. Because young adult males are the socio-demographic group at most risk for gambling problems (Delfabbro 2012; Reith 2007; Williams et al. 2012b), their immersion in a culture of sports betting shaped by gambling promotions during sporting fixtures is particularly concerning. Indeed, many responsible gambling campaigns target young men due to their elevated risk of problem gambling. However, these campaigns compete with abundant advertising messages that promote and endorse gambling for this socio-demographic group and that socialise young males into a culture of sports betting making their behaviour difficult to change (JSCGR, 2013). Another study of the self-reported impact of sports-embedded gambling promotions surveyed 131 Australian adolescents (Hing et al. 2014c). It found that greater intention to gamble once of legal gambling age was positively associated with higher frequency of watching televised sports where gambling is promoted, along with more positive attitudes to gambling operators, to gambling promotions during televised sport and to the promotional techniques used. However, neither this nor Thomas et al. (2012b) examined any differential effects for problem gamblers. Nevertheless, Hing et al. (2013) did find that problem and at-risk student gamblers were more likely than their non-problem gambler counterparts to have greater exposure to these gambling promotions and to be more likely to view the associated sponsors favourably, to be interested in the sponsor and to consider using the promoted gambling products.

Although causal pathways between exposure to gambling promotions during sport broadcasts and gambling and problem gambling remain unclear, treatment services in Australia where these promotions are most prolific have reported increased clientele seeking help for sports betting-related problems (Hunt 2013; University of Sydney Gambling Treatment Clinic 2011; Victorian Responsible Gambling Foundation, 2013). Further, 16 % of problem and moderate risk Internet gamblers in a sample of 4,688 adult Australian gamblers, weighted to be representative of the Australian adult population, identified sports betting as their most problematic gambling form (Hing et al. 2014b). Predictors of problem or moderate risk

gambling amongst these Internet gamblers were younger age, being male, being married, and gambling on sports, races or poker. Thus, current evidence suggests that the contribution of sports betting to gambling problems in Australia is increasing. However, whether promotions embedded within broadcasts of sporting events are fuelling this increase is not well understood.

## Theoretical Framework

As noted earlier, this study was underpinned by the TRA (Fishbein 1967; Fishbein and Ajzen 1975), which is one of several theories posited to explain attitudes and attitude-behaviour correspondence (Cacioppo et al. 1994). According to the TRA, behavioural intention is the single best predictor of behaviour. Behavioural intention is a function of two factors: attitude based on an individual's favourable or unfavourable evaluation of the behaviour in question as determined by their beliefs about the likely consequences of performing the behaviour; and subjective norms, or an individual's perceptions of social pressures to perform or not perform a particular behaviour, with family and friends being the key normative influences. A third predictor of intention, added by the Theory of Planned Behavior (TPB; Ajzen 1985; Ajzen and Fishbein 1980), is perceived behavioural control (PBC), or an individual's belief concerning how easy or difficult it will be to perform the behaviour. Because of the inability to measure future gambling behaviour in the present study, full use of the TPB was precluded; hence a combined TRA/TPB framework was deployed with intention as the outcome variable.

The TRA/TPB was considered a suitable theoretical foundation for this study as it is well supported by empirical evidence in health research (Stead et al. 2005), research into use of harmful products (Marcoux and Shope 1997; Norman et al. 1999), and gambling research. Key areas of focus in gambling research have included casino gambling (Oh and Hsu 2001; Phillips 2009; Song 2010), online gambling (Jolley et al. 2006), lottery gambling (Sheeran and Orbell 1999; Walker et al. 2005; Wood and Griffiths 1998), ethnicity and gender in gambling (Walker et al. 2005; Walker et al. 2006), gambling by children and young people (Moore and Ohtsuka 1997; Wood and Griffiths 2004) and gambling amongst college students (Larimer & Neighbors 2003; Moore and Ohtsuka 1999; Neighbors et al. 2007; Sheeran and Orbell 1999; Thrasher et al. 2007). Thus, the TRA formed the foundation theory for the present study, with the added TPB variable of PBC.

Three factors related to gambling behaviour were considered likely to influence sports betting intention and were added to the research model. These were previous sports betting behaviour, previous gambling behaviour and problem gambling severity, with previous research finding positive associations between exposure to/recall of gambling advertisements and severity of gambling problems (Binde 2009; Boughton and Brewster 2002; Derevensky et al. 2010; Grant and Kim 2001; Korn et al. 2005). A literature review identified five key factors related to gambling promotions during televised sport that potentially influence sports betting intention, and these were also added to the research model. One factor was exposure to these promotions, given previous research identifying associations between exposure to gambling advertising, attitudes and intention to gamble and gambling behaviour (Derevensky et al. 2010; Korn et al. 2005). A second factor was sport watching involvement, because advertisements have been found to impact most on consumers with high product involvement (e.g., Laczniaik et al. 1989; Petty et al. 1983; Walliser 2003). Additional factors comprised attitude to gambling promotions during televised sport, attitude to gambling sponsors of televised sport, and attitude to promotional techniques used during televised sport, with positive attitudes to these factors considered likely to increase sports betting intention.

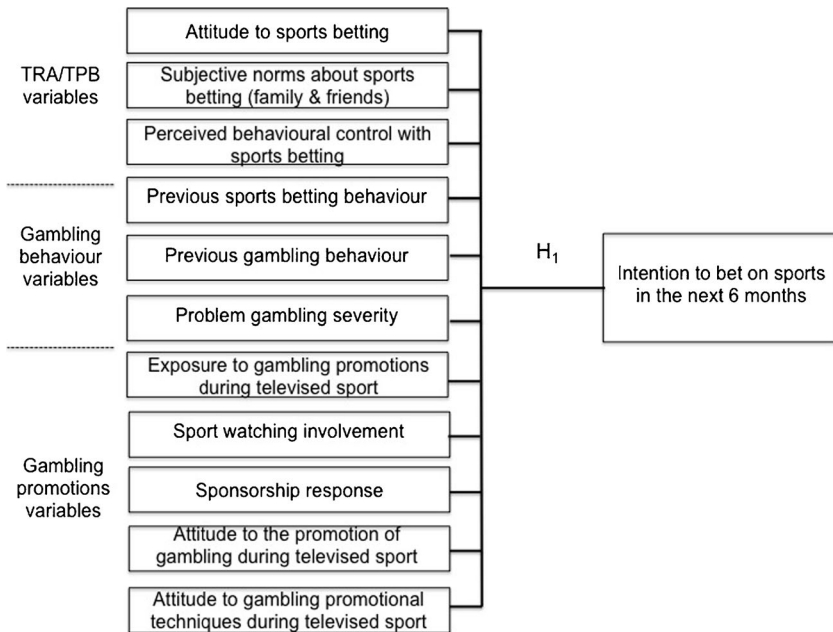
Figure 1 depicts relationships examined where these eight factors are integrated with the TRA to predict sports betting intention. Of major interest was whether exposure and attitude to gambling promotions during televised sport provide additional explanatory value in predicting sports betting intention, beyond what might be explained by the TRA, and whether intention varies with problem gambling severity and previous gambling behaviour. The following hypothesis tested relationships depicted in Fig. 1.

H<sub>1</sub> Intention to bet on sports in the next 6 months is predicted by 1) attitude to sports betting, subjective norms about sports betting (family and friends) and perceived behavioural control with sports betting 2) previous sports betting and gambling behaviour and problem gambling severity, and 3) exposure and attitudes to gambling promotions during televised sport.

**Methods**

**Recruitment and Sampling**

A university human research ethics committee approved this study. A panel of 1,000 respondents completed an online survey. Research panels comprise people registered with a market research company to receive invitations to participate in online surveys (Gritz et al. 2000). Online panels are customised to researchers’ requirements, in this case persons aged 18 years or over, with the panel representative by gender and metro/non-metro location. The study focused on adults in the Australian state of Queensland where betting promotions are commonly embedded into televised sports. The market research company screened the research panel through duplicate identification checks and discarded illegitimate data (e.g.,



**Fig. 1** Research model and hypothesis



completing the survey too quickly, straight-lining through responses). Respondents were paid by the market research company.

Online panels are increasingly used for research for substantial cost savings and their higher response rates than unsolicited surveys, thus yielding more reliable data due to survey completeness (Behrend et al. 2011; Evans and Mathur 2005; Gritz et al. 2000). In contrast, general population surveys typically obtain low response rates which can significantly bias samples, even when expensive CATI systems are used that necessarily rely on landlines alone due to the non-availability of all-inclusive lists of mobile phone numbers. A further advantage over telephone surveys is that online surveys provide privacy and anonymity, which should increase response accuracy about sensitive subjects such as gambling (Shih and Fan 2008; Wood and Williams 2009). Disadvantages of online panels include restriction to Internet users, although this bias is now very small with 82.3 % of Australians being Internet users (World Bank, 2014). Online survey panels may be biased in other unknown ways such as attitudes, but no more so than representative samples based only on demographic variables.

## Measures

Respondents completed questions relating to 13 constructs, each with multiple items. A number of scales were based on prior literature while other measures were developed for the study. The measures, their origin, number of items, sample items and where appropriate, Cronbach's alpha for each scale are summarised in Table 1.

## Procedure

The survey was administered online during October 2012, just after the seasons for the two most popular football sports in Australia (rugby league and Australian Rules football) had ended to optimise respondent recollection of the gambling promotions embedded in these sports. These two sports contain the most sports betting-related promotions of all televised sports in Australia (Lamont et al. 2011; Milner et al. 2013; Thomas et al. 2012a).

## Participants

Of the 1,000 respondents, 49.5 % were men and 50.5 % were women, with metro/non-metro residence being 46.6 %/53.4 %. Both of these proportions aligned with Queensland adult population norms (Australian Bureau of Statistics [ABS], 2011). Age ranged between 18 and over 85 years and, compared to the Queensland adult population, people aged 45–74 were slightly over-represented, with the other age groups being slightly under-represented (ABS, 2011). Respondents were typically married (53.5 %), living as a couple with no children (32.4 %), had a highest educational qualification of trade/technical certificate/diploma (33.4 %), were retired (26.3 %), had a household income of \$20,000–\$39,999 (23 %), and were born in Australia (74.3 %).

## Results

### Exposure to Gambling Promotions During Sport

Only 15.2 % of respondents reported never watching televised sport. The most frequently viewed televised sport was rugby league, watched at least weekly by 33.4 % and at least

**Table 1** Summary of measures used in study

Scale	Measure or adaptation of original scale	No. of items	Sample items/explanation	Measurement	Cronbach's alpha
Attitude to sports betting	Moore and Ohtsuka (1997)	12	'There is too much sports betting today'; 'Sports betting is bad for society'	5-point scale strongly disagree to strongly agree	0.88
Subjective norms about sports betting (family and friends)	Moore and Ohtsuka (1997)	12	'My friends would approve of me wanting to bet on sports'; 'My family approves of sports betting'	5-point scale strongly disagree to strongly agree	0.86
Perceived behavioural control with sports betting	Developed for this study	4	'During the next six months, I will be financially able to bet on sports'; 'During the next six months, I will have sufficient time to bet on sports'	5-point scale strongly disagree to strongly agree	0.79
Future sports betting intention	Moore and Ohtsuka (1997)	8	Intention of betting on 8 different types of sports during the next 6 months	5-point scale strongly disagree to strongly agree	0.97
Previous sports betting behaviour	Developed for this study	8	Frequency of betting on 8 different types of sports during the past 12 months	7-point scale never to daily	Summed frequency
Previous gambling behaviour	Previous gambling surveys	7	Frequency of gambling during the past 12 months on 7 gambling types, excluding lottery and sports betting	7-point scale never to daily	Summed frequency
Problem gambling status	Ferris and Wynne (2001) PGSI	9	In the last 12 months, how often have you: 'Bet more than you could really afford to lose'; 'Needed to gamble with larger amounts of money to get the same feeling of excitement'	Never=0, sometimes=1, most of the time=2, almost always=3 Cut-off scores: 0=non-problem gambler, 1–2=low risk gambler, 3–7=moderate risk gambler, 8–27=problem gambler	0.95
Exposure to gambling promotions during televised sport	Developed for this study	8	Frequency of watching 8 televised sports during most recent season, identified as the most heavily sponsored by gambling operators.	7-point scale never to daily	Summed frequency



**Table 1** (continued)

Scale	Measure or adaptation of original scale	No. of items	Sample items/explanation	Measurement	Cronbach's alpha
Sports watching involvement	Kyle et al. (2007)	5	'Watching sport is very important to me'; 'I find a lot of my life is organised around watching sport'	5-point scale strongly disagree to strongly agree	0.86
Attitude to gambling sponsors of televised sport	Speed and Thompson (2000)	9	'Promotion of gambling brands during televised sport makes me feel more favourable towards the gambling brands being promoted'	100-point sliding scale	0.97
Attitude to the promotion of gambling during televised sport	Developed for this study	6	'Good/bad'; 'like/dislike'; 'harmless/harmful'	5-point semantic differential scale	0.94
Attitude to gambling promotional techniques during televised sport	Developed for this study		'On-screen displays of live betting odds'; 'pre-match commentary on betting odds'	5-point scale strongly disapprove to strongly approve	0.97
Impact of sports gambling promotions on behaviour	Developed for this study	6	'Increased your frequency of sports betting'; 'caused you to spend more money on sports betting than you had intended'	5-point scale strongly disagree to strongly agree	N/A
Socio demographic data	Various measures	9	Gender, age, marital status, household type, education, work status, household income, country born, metro/non-metro residence	Various	N/A

monthly by 51.4 % of respondents. The second most frequently watched televised sport was Australian Rules football (AFL), watched at least weekly by 16.3 % and at least monthly by 31.9 % of respondents. The least watched televised sport was golf, watched at least weekly by only 5.1 % and at least monthly by 15.8 % of respondents.

### Previous Sports Betting Behaviour

Ninety-five respondents (9.5 %) had bet on sport during the previous 12 months. Rugby league was the sport attracting the most frequent sports betting with 15.2 % placing bets on rugby league at least once a week, and 36.6 % of sports bettors doing so at least once a month. Additionally, 15.3 % of sports bettors gambled on Australian Rules football at least once a week and 29.4 % did so at least monthly. Golf attracted the least betting, with 67.8 % of sports bettors never wagering on this sport.

### Previous Gambling Behaviour

The most frequent gambling activities engaged in during the previous 12 months amongst the 1,000 respondents were gambling on poker machines (6.6 % at least weekly/19.4 % at least monthly), horse/dog races (4.2 %/10.2 %) and keno (3.6 %/13.1 %).

### Problem Gambling Severity

Problem gambling categories were derived from the PGSI and based on Ferris and Wynne (2001), and indicated that 782 (78.2 %) participants were non-problem gamblers, 97 (9.7 %) participants were low risk gamblers, 62 (6.2 %) participants were moderate risk gamblers, and 59 (5.9 %) participants were problem gamblers. Thus, the sample was skewed towards higher problem gambling severity when compared with the general Queensland adult population (Queensland Government 2012).

### TRA Variables

Table 2 compares mean scores on all TRA scales across the four PGSI groups. There were significant differences for all scales as a function of PGSI category. Follow-up pair-wise contrasts, controlling for Type I error, are also reported in Table 2.

Compared to the other PGSI groups, problem gamblers were significantly more influenced by subjective norms in relation to sports betting and intended to sports bet and gamble more in the future. However, they were not significantly different to the other PGSI groups on attitude to and perceived behavioural control with sports betting.

### Gambling Promotions Variables

Table 3 compares mean scores on the gambling promotions scales across the four PGSI groups. There were significant differences for all scales as a function of PGSI category. Follow-up pair-wise contrasts, controlling for Type I error, are also reported in Table 3.

Compared to the other PGSI groups, problem gamblers had significantly greater exposure to televised gambling promotions in sport and a more positive attitude to gambling sponsors. Compared to non-problem gamblers and low risk gamblers, problem gamblers had a significantly more positive attitude to gambling promotions during televised sport and to the

**Table 2** Comparison of mean scores amongst PGSI groups for TPB scales (standard deviations in parentheses)

	Non-problem gambler ( <i>n</i> =782)	Low risk gambler ( <i>n</i> =97)	Moderate risk gambler ( <i>n</i> =62)	Problem gambler ( <i>n</i> =59)	F	Contrast
Attitude to sports betting	2.7 (.7)	3.0 (.7)	3.0 (.6)	2.8 (.5)	10.58**	Non<Low Non<Mod
Subjective norms about sports betting	57.2 (29.3)	64.5 (30.6)	75.5 (32.5)	91.6 (42.9)	28.93**	Non<Mod Non<Prob Low<Prob Mod<Prob
Perceived behavioural control with sports betting	2.8 (.9)	3.2 (.8)	3.2 (.7)	3.1 (.8)	6.72**	Non<Low Non<Mod
Sports betting intention	1.1 (.3)	1.2 (.7)	1.2 (.4)	2.7 (1.8)	162.78**	Non<Prob Low<Prob Mod<Prob
Gambling intention	1.4 (.5)	1.9 (.7)	2.1 (.8)	3.0 (1.4)	140.68**	Non<Low Non<Mod Non<Prob Low<Prob Mod<Prob

\*\*  $p < 0.01$ , *Non*=non-problem gamblers, *Low*=Low risk gambler, *Mod*=Moderate risk gambler, *Prob*=Problem gambler

**Table 3** Comparison of mean scores amongst PGSI groups for exposure and attitudes to gambling promotions during televised sport (standard deviations in parentheses)

	Non-problem gambler ( <i>n</i> =782)	Low risk gambler ( <i>n</i> =97)	Moderate risk gambler ( <i>n</i> =62)	Problem gambler ( <i>n</i> =59)	F	Contrast
Exposure to gambling promotions in televised sport	2.1 (1.0)	2.5 (1.1)	2.5 (1.1)	3.2 (1.4)	23.93**	Non<Low Non<Mod Non<Prob Low<Prob Mod<Prob
Sport watching involvement	2.3 (.9)	2.6 (1.0)	2.7 (.9)	3.0 (1.0)	14.47**	Non<Low Non<Mod Non<Prob
Attitude to gambling sponsors	16.3 (19.2)	29.1 (22.3)	33.1 (22.36)	50.2 (23.7)	58.90**	Non<Low Non<Mod Non<Prob Low<Prob Mod<Prob
Attitude to gambling promotions during televised sport	1.9 (.9)	2.3 (1.0)	2.5 (1.1)	2.8 (1.1)	28.75**	Non<Low Non<Mod Non<Prob Low<Prob
Attitude to gambling promotional techniques	2.0 (.9)	2.4 (.8)	2.5 (.9)	2.9 (.9)	26.24**	Non<Low Non<Mod Non<Prob Low<Prob

\*\*  $p < 0.01$ , *Non*=non-problem gamblers, *Low*=Low risk gambler, *Mod*=Moderate risk gambler, *Prob*=Problem gambler \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

**Table 4** Comparison of mean scores amongst PGSI groups for the Perceived Influence of Gambling Promotions on Sports Betting Behaviour Scale ( $N=95$ )

	Non-problem gambler ( $n=45$ )	Low risk gambler ( $n=15$ )	Moderate risk gambler ( $n=11$ )	Problem gambler ( $n=24$ )	F
Increased your frequency of sports betting	2.2	2.7	3.1	3.3	7.43***
Increased your expenditure on sports betting	2.1	2.7	2.8	3.4	10.55***
Increased the time you spend on sports betting	2.1	2.7	2.7	3.3	8.70***
Caused you to spend more money on sports betting than you had intended	2.0	2.6	2.6	3.5	12.14***
Caused you to spend more time on sports betting than you had intended	2.0	2.7	2.6	3.7	15.49***
Caused you or those close to you any sports betting-related harm	1.9	2.1	2.6	3.5	12.94***

Stem question: How strongly do you agree or disagree that gambling promotion during televised sport has...?

\*\*\*  $p < 0.001$

different promotional techniques used. Compared to non-problem gamblers, problem gamblers had greater levels of sport watching involvement.

### Subjective Responses

In addition to measures used to test the hypothesis, sports bettors in the sample ( $n=95$ ) were asked for subjective responses in relation to how sports-embedded gambling promotions have impacted on different aspects of their sports betting. The results should be interpreted with caution, given small numbers in some PGSI groups. As shown in Table 4, significant differences were found amongst the four PGSI groups for all items. For all items, the mean score was highest for the problem gambler group indicating they had the highest agreement that gambling promotions during televised sport have increased their frequency, expenditure and time spent on sports betting, that they have caused them to spend more money and time on sports betting than intended, and have caused them or someone close to them sports betting related harm. Table 4 also shows a general pattern of increasing agreement as problem gambling severity increased. The mean scores show that, on average, the problem gambler group agreed that gambling promotions have had these effects on their sports betting behaviour. In contrast the non-problem gambler group, on average, disagreed that gambling promotions have had these effects on their sports betting behaviour.

### Hypothesis Testing

A hierarchical regression model was constructed to test the hypothesis that intention to bet on sports in the next 6 months is predicted by, 1) attitude to sports betting, subjective norms about sports betting (family and friends) and perceived behavioural control with sports betting, 2) previous sports betting and gambling behaviour and problem gambling severity, and 3) exposure and attitudes to gambling promotions during televised sport.

On Step 1, attitude to sports betting, subjective norms and perceived behavioural control were entered. These variables were the core TRA/TPB variables. Additionally, as gender differences are usually observed in gambling research and specifically for sports betting behaviour in Queensland (Queensland Government 2012), gender was also controlled for in the analysis. On Step 2, previous sports betting participation (measured with a dichotomous group variable capturing those who had compared to those who had not engaged in sports betting in the past 12 months), previous gambling frequency (based on a composite measure of gambling frequency across the seven non-lottery and non-sports gambling forms), and PGSI were added. These variables reflect participants' previous gambling behaviour and problem gambling severity. On Step 3, the five sports betting promotion variables were added comprising exposure to gambling promotions, sport watching involvement, attitude to gambling sponsors, attitude to gambling promotions during televised sport, and attitude to gambling promotional techniques during televised sport. The output for each regression analysis refers to the standardised coefficient (beta or  $\beta$ ). This standardised statistic allows the relative strength of predictors to be compared (a beta with a higher absolute value can be interpreted as a stronger predictor of the outcome variable). A positive value indicates that those with higher scores on the predictor variable tend to have higher scores on the dependent variable.

Step 1 was significant,  $R^2=.14$ ,  $F(4, 830)=34.72$ ,  $p<0.001$ , with gender and subjective norms both significant independent predictors of sport betting intention (Table 5). Males were more likely than females to intend to sports bet in the future, and a more positive perception of social norms toward sports betting was also independently associated with higher reported frequency of intention to sports bet in the next 6 months.

Including the gambling behaviour variables on Step 2 significantly improved model fit,  $\Delta R^2=.35$ ,  $\Delta F(3, 827)=189.34$ ,  $p<0.001$ . At Step 2, sports betting participation in the past 12 months, increased gambling frequency in the past 12 months, and higher PGSI scores all corresponded to increased intended sports betting frequency in the next 6 months. At Step 2, gender was no longer a significant independent predictor, although subjective norms remained significant.

The addition of the five sports betting promotion variables on Step 3 significantly improved model fit,  $\Delta R^2=.02$ ,  $\Delta F(5, 822)=189.34$ ,  $p<0.001$ , and the overall model was significant,  $R^2=.51$ ,  $\Delta F(12, 822)=71.81$ ,  $p<0.001$ . On Step 3, exposure to gambling promotions and attitude to gambling promotions were both independent significant predictors. A more positive attitude to gambling promotions during televised sport and greater exposure to gambling promotions during televised sport both were associated with increased intended sports betting frequency in the next 6 months. At this step, all gambling behaviour variables and subjective norms remained significant. In addition, sports betting attitude was also a significant predictor at this step. As sports betting attitude became more negative, intended sports betting frequency increased. However, the bivariate relationship between sports betting attitude and intention to sports bet was positive.

In summary, greater intended frequency of betting on sports in the next 6 months was predicted by seven variables (Table 5). In descending order of strength, these were higher PGSI score, previous sports betting participation, higher frequency of exposure to gambling promotions during televised sport, a more positive attitude to gambling promotions during televised sport, more positive subjective norms about sports betting, a more negative attitude to sports betting, and higher previous gambling frequency. Thus,  $H_1$  was partially supported.

**Table 5** Stepwise regression model predicting sports betting intention in the next 6 months

Variable	Sports betting intention in the next 6 months	
	$R^2$	$\beta$
Step 1		
Gender		-.084*
Attitude to sports betting		-.033
Subjective norms about sports betting		.356***
Perceived behavioural control about sports betting		.039
Total $R^2$	.139	
Step 2		
Gender		-.042
Attitude to sports betting		-.036
Subjective norms about sports betting		.138***
Perceived behavioural control about sports betting		-.025
Previous sports betting participation		.228***
Previous gambling frequency		.104***
PGSI score		.475***
Total $R^2$	.492	
Step 3		
Gender		-.035
Attitude to sports betting		-.090**
Subjective norms about sports betting		.090**
Perceived behavioural control about sports betting		-.034
Previous sports betting participation		.201***
Previous gambling frequency		.075*
PGSI score		.445***
Exposure to gambling promotions during televised sport		.107**
Sport watching involvement		-.002
Attitude to gambling sponsors		.031
Attitude to promotion of gambling during televised sport		.093*
Attitude to gambling promotional techniques		.026
Total $R^2$	.512	

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ 

## Discussion

This study's results support the pervasive reach of sports-embedded gambling promotions (Hing et al. 2014a; Lamont et al. 2011; JSCGR, 2013; McMullan 2011), with substantial proportions of respondents routinely exposed to them while watching televised sport. In this study the most frequently watched televised sports were rugby league and Australian Rules football, which also contain the most sports betting-related promotions of all televised sports in Australia (Lamont et al. 2011; Milner et al. 2013; Thomas et al. 2012a). These sports are also the two largest wagering sports, attracting approximately 50 % of all sports wagering in Australia, with 5 % of related betting turnover paid as product fees to these sporting leagues

(Deloitte 2012). Thus, the results suggest that commercial arrangements between sports betting operators and sporting bodies have resulted in the embedding of most sports betting promotions into the most frequently watched televised sports.

Further, problem gamblers in the sample were more likely to watch more televised sport containing sports betting promotions, compared to the other PGSI groups, which is concerning given their greater reported stimulus to gamble from gambling advertising (Clarke et al. 2006, 2007; Felsner et al. 2004a, 2004b; Hoa et al. 2012; McCormack et al. 2013; Schottler Consulting 2012). Further, the problem gambler respondents had more positive attitudes to the gambling promotions, with previous research indicating greater behavioural response when attitudes to advertisements are positive (Gardner 1985; Gresham and Shimp 1985; Mehta 2000; Mitchell and Olson 1981; Muehling 1987; Shimp 1981). Therefore, the audience most likely to be stimulated to gamble from watching gambling advertisements embedded into televised sport appear to be problem gamblers.

The problem gambler sports bettors in the present study also reported, overall, that sports-embedded gambling promotions have maintained or worsened their problem gambling behaviours. While the study did not examine associated reasons, this result is consistent with previous research showing that gambling advertising can provide reminders and inducements to gamble, trigger gambling, and undermine attempts to moderate gambling (Binde 2009; Hing et al. 2014a), with relapse a common experience amongst recovering problem gamblers (Battersby et al. 2010; Hodgins & el-Guebaly, 2004). Qualitative research could investigate whether these same reasons apply to sports-embedded gambling promotions.

Hypothesis testing also indicated that greater intended frequency of sports betting in the next 6 months was most strongly predicted by greater exposure to gambling promotions during sports broadcasts, higher problem gambling severity, and previous sports betting participation. Two explanations for this finding are possible. The first is that problem gamblers, existing sports bettors and those with greater intention to sports bet more frequently are more likely to watch more televised sport and are therefore more exposed to advertisements and promotions to gamble. This effect is highly likely, given the assumed interest sports bettors would have in watching sporting events they might bet on. However, the self-reported impacts of exposure to these promotions on problem gamblers, as explained earlier, support an alternative explanation that exposure to these promotions increases sports betting intentions amongst those who already have high and problematic gambling involvement. This second explanation aligns with previous findings that gambling advertising and promotions have most effect on maintaining or increasing established gambling patterns and have little impact on converting non-gamblers to gamblers (Binde 2007, 2009; Derevensky et al. 2010; Hing et al. 2014a). It also aligns with more general advertising research indicating that advertising impacts most on consumers with high product involvement (e.g., Laczniak et al. 1989; Petty et al. 1983; Walliser 2003). Prior research also suggests that high involvement gamblers are most attentive to gambling advertising and that these messages can create impulses to gamble (Binde 2009; Boughton and Brewster 2002; Derevensky et al. 2010; Grant and Kim 2001; Hing et al. 2014a; Korn et al. 2005). Further research is needed to illuminate whether these same mechanisms might maintain or increase sports betting engagement amongst highly involved and problem sports bettors exposed to gambling promotions during sports broadcasts.

The second explanation for the hypothesis results is also supported by previously identified associations between exposure to gambling advertising, attitudes and intention to gamble, and gambling behaviour (Derevensky et al. 2010; Hing et al. 2013; Korn et al. 2005; Lee et al. 2008), although these cross-sectional studies cannot demonstrate causality. Nevertheless, qualitative studies suggest a causal relationship between increased exposure to sports betting advertising and greater sports betting intention and behaviour. Thomas et al. (2012b)



interviews with 100 adults in Victoria, Australia, found that younger adult men, high risk gamblers and those from low socio-economic backgrounds reported being particularly influenced by gambling promotions offered by online betting sites. Similarly, Hing et al. (2014a) found that advertisements and promotions for online gambling, including for sports betting, invoked strong temptations and increased gambling amongst a sample of Australian treatment-seeking gamblers. Clearly, longitudinal research is needed to confirm possible causal pathways between exposure to gambling advertising and gambling intentions and behaviours, particularly for high risk groups such as problem gamblers and young adult men.

Unfortunately, resources for the current study did not allow a longitudinal design. Other study limitations include use of a research panel rather than a random general population sample. However, telephone survey methodologies used to generate random samples have become increasingly problematic as they fail to incorporate inclusive lists of mobile telephone numbers. A telephone survey was considered particularly inappropriate for the current study given that Internet wagerers are predominantly young males (CLSA 2013) and are more likely to live in group households (Hing et al. 2014b), suggesting that sports bettors may be less likely to have landlines compared to the general population. Further, only gambling intention was measured, not gambling behaviour, as the cross-sectional survey could not measure future gambling behaviour. Additionally, study participants have been exposed to other gambling promotions via other media, and no attempt was made to partial out these effects. All data were self-report and relied on respondents' recall and perhaps biased memories. A further limitation which presents a potentially fruitful avenue for further research is that this study examined sports betting promotions as a whole despite there being a range of promotional types including logos, signage, websites, commentary and betting odds. Thus, conclusions drawn are related to sports-embedded promotions in general whilst it could be that some types of promotions are more pervasive than others in encouraging greater intended frequency of sports betting.

Nevertheless, the study contributes some foundational knowledge about the differential perceived effects of sports-embedded gambling promotions on adults with varying levels of problem gambling severity. It also contributes to theory development on the effects of gambling advertising during sport. While much further research is needed, the findings demonstrate the utility of some TRA and TPB constructs in predicting sports betting intention, particularly subjective norms. However, further research is needed to confirm the utility of the TRA/TPB in predicting sports betting intention and behaviour, given that the gambling behaviour and some gambling promotions variables provided greater predictive power in the present study.

## Conclusion

This study is the first to use a theory-driven approach utilising quantitative methods to examine whether exposure and attitude to gambling promotions during televised sport predict adult sports betting intention and whether this relationship varies with problem gambling severity. Results suggest that the audience most likely to be stimulated to gamble by these promotions are problem gamblers because they have greatest exposure and a favourable disposition to them, with the problem gambler sports bettors also reporting, overall, that these promotions have maintained or worsened their problem gambling behaviours. While the hypothesis testing could not demonstrate causality, its results are consistent with previous research that has found a relationship between increased exposure to sports betting advertising and greater sports betting intention and behaviour.

Much further research is needed to verify and extend the results of this study, particularly studies that illuminates whether and how exposure to this advertising shapes gambling and sports betting behaviour, and longitudinal research examining any causal relationships between sports-embedded gambling promotions and problem gambling. Nevertheless, a precautionary approach suggests the need to consider policy and public health interventions to minimise sports betting-related harm. These interventions could include social marketing initiatives to offset the persuasive appeal of this sports betting advertising and ensuring that responsible gambling provisions of sports betting operators are rigorous, efficacious and well promoted to consumers. Consideration could also be given to tighter restrictions on the nature and extent of gambling messages promoted during sports broadcasts given the power of the media to shape consumer behaviour.

**Acknowledgments** This study was funded by a Responsible Gambling Research Grant from the Queensland Department of Justice and Attorney General. We also acknowledge statistical advice from Alex Russell of the Centre for Gambling Education and Research at Southern Cross University.

**Conflicts of Interest** Author A, Author B, Author C and Author D have no conflicts of interest to declare in relation to this paper. Author A, Author B, Author C and Author D declare that they have no financial relationship with the organisation that sponsored this research.

**Informed Consent** All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients for being included in the study.

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