

**RESEARCH
REPORT**

Implicit associations between gambling and sport

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Implicit associations between gambling and sport

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Table of contents

Executive summary	4
Background	6
Approach	22
Results	28
Conclusions	38
References.....	42

Executive summary

Background

Sports betting turnover has increased nearly eightfold in Victoria in the last decade, which is more than double the national increase in the same timeframe (Queensland Government Statistician's Office 2015). The rapid growth in the sports betting industry was perceived to be a result of the marked increase in embedded marketing across multiple modalities, contributing to the public outcry. Whilst legislative reform has addressed some of the most publicly concerning practices, the level of direct and indirect advertising remains of concern. Emergent evidence relating to gambling sponsorship and advertising is suggesting impacts similar to other products of public health concern such as tobacco, alcohol and high fat, salt and sugar (HFSS) food, in relation to behaviour adoption and levels of consumption. Whilst advertising, especially indirect advertising, exists in a complex environment of behavioural determinants, it is possible to isolate particular aspects of influence and test their effect on behaviour. The Implicit Association Test (IAT) allows the objective isolation and examination of the nonconscious influences of gambling advertising in sport, on one particularly vulnerable population, youth.

Approach

The present project aimed to assess the influences of sport-related gambling advertising on both adolescents (aged between 14 and 17) and young adults (aged between 18 and 24) who lived in Australia, through a combination of experimental and survey approaches. First, we examined whether our participants implicitly associated gambling with sport, by assigning them to complete one of four versions of IAT, based on a 2 × 2 between-subjects experimental design: (types of gambling: sport-relevant vs. sport-irrelevant) by (types of sport: gambling-relevant vs. gambling-irrelevant). The IAT asked the participants to classify pictures into either “gambling logos” or “other logos” and classify named words into either “sports” or “hobbies”. Depending on the version participants were assigned to, they viewed logos for gambling companies who ran/manufactured sport-relevant or sport-irrelevant gambling games, and names for sports that were relevant or irrelevant to gambling in Australia. Furthermore, across all four versions of the IAT, participants also viewed logos for companies who did not operate in the gambling industry and names for hobbies that did not involve sporting elements, which served as baseline for comparisons to gambling logos and sport names. In addition to the experiment, this project also employed a self-report survey questionnaire that included a variety of questions on gambling, sport viewing, and demographic background. Ethics approval was granted to the project by the CQUniversity Human Research Ethics Committee (approval number: H15/09-209).

Results

The experimental and survey data included 930 valid participants in the 18 and above age group, and 915 valid participants in the below 18 age group. Despite the two groups having been collected through two separate study links, they reported similar household income, cultural background, English proficiency, and residential location. Moreover, their gambling attitudes, gambling intentions, and beliefs about gambling advertising did not vary much.

Three important results emerged from the analysis conducted in the R statistical programming environment. Firstly, across both age groups, there was a stronger association between gambling and sport than their respective associations with the control stimuli. In other words, gambling and sport appeared to have become connected concepts in participants' minds: the presence of one of them (e.g., a soccer match), could facilitate fluency in making decisions about the other (e.g., a gambling company logo advertisement), compared to concepts less connected to them (e.g., a mining company logo advertisement). The other two key results justified the 2 × 2 between-subjects design based on types of gambling and types of sport: there was a stronger implicit association between gambling and sport, when the gambling logos were sport-relevant, rather than sport-irrelevant, or when the sports were gambling-relevant, rather than gambling-irrelevant.

Conclusions

The present project demonstrated that sport-related gambling sponsorship and advertising can shape the nonconscious minds of the Australian youth population. Within the sample there was an implicit association between gambling and sport. This association was strengthened when gambling logos were sport-relevant or when the sports were gambling-relevant. Whilst the long term impact of this association is not possible to determine without longitudinal research, previous findings from studies relating to gambling, alcohol, and tobacco, suggest that this is likely to contribute to increased levels of gambling related harm within the community. These findings provide evidence that a broader view of gambling advertising, that includes sponsorship and other forms of incidental consumer brand encounters (ICBEs), should be adopted, bringing it into line with current harm minimisation approaches to alcohol and tobacco.

Background

There is increasing community concern about the proliferation of gambling advertising in sport. Initially, this was expressed and debated as an issue of public opinion, but more recently has attracted significant political attention. A series of government reviews and actions ensued (COAG 2011; Parliamentary Joint Select Committee on Gambling Reform 2013), followed by the commissioning of exploratory research in some jurisdictions. The broader focus of this attention, to date, has been on the impact of sports betting advertising on sport in general, and the impact on young spectators in particular. Research has so far focussed on advertising contents, the ways in which individuals interact with advertisement generating commentaries, and relevant consumer beliefs (Lamont, Hing & Gainsbury 2011; Parke, Harris, Parke, Rigbye & Blaszczynski 2015; Thomas 2014; Thomas, Lewis, Duong & McLeod 2012). Whilst understanding community beliefs around the issue has been an important first step, it has long been established that a nexus often exists between human beliefs and behaviours. To date, there still exists a lack of objective behavioural research that can inform policies surrounding gambling advertising in sport and its potential effects on young people. Gambling is an emotive topic within the community, and sports gambling generates large revenues for providers operating in an internationally competitive market, creating strongly vested interests. This makes it critical to have empirical evidence on which to base policy decisions.

1.1 Context

1.1.1 The growth in sports betting in Victoria and Australia

The sports betting industry has experienced significant growth since the 1990s. For example, between the 1994-95 and 2004-05 financial years, total sports betting turnover in Victoria increased from \$22.967 million to \$180.447 million, and nationally from \$108.413 million to \$1,627.672 million (Queensland Government Statistician's Office 2015). Turnover describes only the actual amount wagered, and does not include any additional charges that may be paid at the point of purchase such as commissions or agents' fees. Expenditure, which describes the amount wagered less any amount won for Victoria between 1994-95 and 2004-05 increased from \$2.57 million to \$24.037 million (Queensland Government Statistician's Office 2015).

Sports betting has been projected to grow at a rate that exceeds any other form of gambling (Financial Counselling Australia 2015). Figures from 2004-05 to 2013-14 show faster growth than during the previous decade. Turnover increased in Victoria from \$180.447 million to \$1,375.390 million and nationally from \$1,627.672 million to \$5,746.612 million (Queensland Government Statistician's Office 2015). In terms of expenditure, between 2004-05 and 2013-14 in Victoria, there was an increase from \$24.037 million to \$213.501 million and nationally from \$116.687 million to \$625.951 million (Queensland Government Statistician's Office 2015). This was facilitated by the increased accessibility, with 40% of sports bets already being made online in 2010 (Productivity Commission 2010). As a result, adult participation rates in sports betting have risen from 6% in 1999 (Productivity Commission 1999) to 13% in 2013, outpacing most other forms of gambling (Hing, Gainsbury, Blaszczynski, Wood, Lubman & Russell 2014).

This growth has benefitted other industries outside of gambling. Some sporting codes are reported to receive product fees of 5% of gross betting wins, increasing the incentive for the embedding of gambling in sport (Deloitte 2012). Sports betting companies are also reported to make large payments for television advertising rights with some major sporting leagues (Hing, Lamont,

Vitartas, & Fink 2015a). Concerns have been expressed over this reciprocal relationship model both overseas (McKelvey 2004) and by Australian researchers (Thomas, David, Randle, Daube & Senior 2016). The expenditure figures quoted above can be seen to represent the gross profit to the operators from sports betting and the increase in expenditure from \$2.57 million to \$213.501 million in Victoria and \$11.495 million to \$625.951 million nationally from 1994-95 to 2013-14 clearly demonstrates the magnitude of growth for this product (Queensland Government Statistician's Office 2015). It is, therefore unsurprising that such significant levels of public concern were expressed and echoed by researchers about the impact of gambling advertising in sports, the vested interests driving it, and the pervasive marketing strategies that had contributed to the growth (Thomas, David et al. 2016).

1.1.2 Legislative responses and reform

The rapid growth in the sports betting industry was perceived to be a result of the marked increase in embedded marketing across multiple modalities, contributing to the public outcry. Substantial public concern was expressed particularly about the intrusive nature of sports betting advertising being embedded in sports telecasts (Hing et al. 2015a). This, in turn, provoked swift and significant responses by the Australian Government, despite the limited amount of peer reviewed research to inform their actions.

The initial government response was the COAG Select Council on Gambling Reform Communique, of 27 May 2011 (COAG 2011) which expressed concern over a perceived “insidious” role of gambling commentary and the normalisation of gambling within sports broadcasts. The sports gambling industry was given the opportunity to address the issues raised through self-regulation under existing industry codes, conditional upon satisfactory arrangements being made by the end of June 2012, at which point the Australian Government would consider the need for changes to legislation. Agreement was reached with commercial and subscription broadcasters to reduce and control the promotion of live odds during sports; ban commentators from mentioning live odds; and cease the associated promotion of sports betting during play (COAG 2011).

Whilst self-regulation saw the restriction of gambling advertisements from screening during General (G) classification periods, exemptions were made for sporting and news-related broadcasts. Industry justified these exemptions by their claims that: sporting programs were primarily watched by adults; that those under 18 made up only 12% of the viewing audience; and those under 18 were also watching under adult supervision (Parliamentary Joint Select Committee on Gambling Reform 2013). However, it has been highlighted that this still equates to nearly 40,000 underage viewers (Parliamentary Joint Select Committee on Gambling Reform 2013) and there is no evidence that the presence of an adult mitigates the impact of the advertising.

Two early studies undertaken around this time measured the level of exposure to gambling advertising during sporting events. Both of the studies looked at advertising during nationally broadcast football matches, although different football codes were examined. The initial study by Thomas, Lewis, Duong, and McLeod (2012) examined gambling advertising during a round of the Australian Football League (AFL) in 2011, identifying concerning rates of exposure to gambling advertising, and raising concerns about the diverse range of marketing techniques used and the lack of responsible gambling or gambling help messages. A further mixed methods study (Lindsay, Thomas, Lewis, Westberg, Moodie & Jones 2013) focussed on the 2012 State of Origin series of rugby league games and found an average of 110.67 episodes of gambling marketing per game.

These findings (Thomas et al. 2012; Lindsay et al. 2013) demonstrated that despite the changes to broadcasts from the voluntary adoption of self-regulation, there were still concerning amounts of

gambling advertising exposure associated with watching sports matches. Unsurprisingly, there was still a high level of public unease around the proliferation of gambling advertising in sport. This unease was explored in a subsequent Victorian qualitative study that found the community was strongly opposed to exposing children to the current level of gambling promotions during sport and was supportive of regulation to minimise harm (Thomas 2014).

In February 2013, the Senate had tasked the Joint Select Committee on Gambling Reform to examine the issue of advertising and promotion of gambling in sport. The scope of inquiry was to include issues of in-ground and broadcast advertising; the role of sponsorship; in-game promotion and integration of gambling into commentary and coverage; exposure and influence on children; contribution to the prevalence of problem gambling and mechanisms that may reduce that prevalence; the effect on public attitudes to sport; the influence of sport betting on the integrity of the sporting code; the impact of inducements to gamble; and any other related matters that emerged as part of the inquiry. From the findings and recommendations of the Joint Select Committee on Gambling Reform (2013), amendments were subsequently made to the Broadcasting Services Act 1992 (Commonwealth). These amendments included banning the promotion of betting odds between the beginning and end of a sports match; banning any mention of betting odds by the commentary team from 30 minutes before the match until 30 minutes following completion; limiting the amount of gambling advertisements played during the match; sports betting representatives being clearly identified and banned from being shown at or around the match grounds; and banning any association of sports betting representatives with the match commentary team. In addition, the legislation required that sports betting advertising must not be targeted at an underage audience and children must not be shown to be participating in gambling or gambling shown in a way that makes it appear to be a family activity. Advertising also must not make exaggerated claims including gambling being portrayed as a way to easy monetary success, or be associated with alcohol. The Committee also recommended that research be commissioned examining the long-term impacts that sports gambling advertising has on children with special emphasis given to research examining the normalisation of sports gambling and this impact on young people.

1.2 The growing link between gambling and sport

Whilst the changes in legislation were wide-ranging in terms of broadcasting and direct advertising, they do not address all forms of advertising for sports gambling products and companies. Sports gambling advertising not only includes traditional advertising modalities but also promotion through team sponsorship. Lamont et al. (2011) categorised sponsorship as falling within the advertising domain because it forms part of a broader marketing mix and unlike acts of philanthropy, for example, there is mutual benefit to both the sponsor and the sponsored team. From the perspective of sports gambling, both direct and indirect (sponsorship) forms of advertising may contribute to the creation of an association between the product and the sport, and the previously mentioned legislative reform did not address modalities such as sponsorship. It is important to explore this association as it may be the case that young people that watch sport are more likely to associate sport with gambling. This is concerning as it morphs a healthy pastime for youth into something that may contribute to harm.

Sponsorship and advertising within sport are an ideal mechanism for gambling products due to the wide popularity of sports in Australia, especially with the target markets for the products.

Sponsorship of sporting teams by gambling companies has been extensive, with 43 commercial gambling providers sponsoring 14 of the 16 teams in a major Australian professional football league in 2009 (Lamont et al. 2011). In terms of exposure for these brands through sponsorship,

the 2015 NRL grand final drew an Australian television audience of over 4.4 million viewers (Bowden 2015), and this did not include international audiences and those reached through internet streaming. Additionally, sponsorship promotes both the idea of gambling as an acceptable recreational option and the sponsor as a good corporate citizen (Lamont et al. 2011).

The aggressive penetration of gambling operators into sports sponsorship is closely linked to the concept of incidental consumer brand encounters (ICBEs) within the marketing literature (Ferraro, Bettman & Chartrand 2009). Originally, ICBEs referred to consumers being incidentally exposed to branding information during daily encounters with other consumers (Ferraro et al. 2009). In the context of the present project, we broaden this definition by using ICBEs to include any incidental brand exposures consumers may experience in their daily life. These ICBEs can take place when they encounter other consumers. For example, a child can walk past a stranger who wears a sporting team's jersey that features a gambling brand who sponsors the team; the same child can attend a game in an arena while hearing two strangers sitting next to her/him talking about the odds provided by a gambling brand. ICBEs may also happen in non-interpersonal contexts, e.g., the child mentioned above can browse the website of a sporting league and come across the gambling brand who sponsors the league. ICBEs are so abundant within capitalist cultures that they are often processed unconsciously by those who are exposed to these messages. It has been identified that increased frequency of exposure to a brand through ICBEs could lead to greater likelihood of choosing that brand, even when exposure is not consciously processed (Ferraro et al. 2009). This effect has also been demonstrated specifically in regard to sponsorship of sport even by a neutral product (mineral water) (Herrmann, Corneille, Derbaix, Kacha & Walliser 2014). In addition to explicit gambling advertising at the game, on player uniforms and sports field signage, the sponsorship branding exists beyond the game or sports venue. Sports gambling advertising is found on merchandise, such as supporter shirts, which expands the audience and subsequent influence of sponsors' messages.

Due to the multiple ways that sports gambling is promoted through sport, there is concern regarding how embedded gambling has become in the experience of viewing or attending sports. The implicit association that has been created through incidental exposure to product advertising raises concerns regarding the proliferation of gambling product exposure in the broader environment and the attitudes and intentions it may foster. Especially concerning is the impact of this implicit association between sports and gambling on more vulnerable consumers, such as young people. This concern is legitimised by past research examining the impact on children of tobacco sponsorship of sport. Pritchard (1992) found that in an Australian sample of 12 to 14 year olds, children across the three different states studied overwhelmingly preferred the tobacco brand that sponsored their own state's football team. This highlights the potential for sponsorship to implicitly influence young viewers.

To date, there has only been one identified empirical research study examining the relationship between gambling sponsorship of sport and attitudes and intentions relating to gambling. Hing, Vitartas, and Lamont (2013) explored this relationship in the context of a major AFL competition that was heavily sponsored by gambling providers. The study was a non-representative sample of 212 participants, primarily full time students, of whom over half identified as strong supporters of the subject football competition. The study examined the association of the attitude to gambling with a gambling sponsor response, and the degree to which that gambling sponsor response was associated with the degree of exposure, the perceived "fit" of the sponsor and event, the perceived sincerity of the sponsor and the attitude to gambling sponsorship of the event. The study found that a positive attitude to gambling sponsorship and more exposure to sponsorship marketing was positively associated with the response to the sponsoring company. This, in turn, was associated with a positive attitude toward gambling and higher gambling intention.

Hing et al.'s (2013) findings could be interpreted to mean that exposure to gambling promotions during sports stimulates a positive view of gambling sponsorship and the gambling sponsors, which engenders a more positive attitude to gambling and stronger intentions to gamble. If this interpretation is correct, it legitimises public concerns about the normalisation of gambling, increased intentions to gamble, and future gambling behaviour. However, as the study was cross sectional, the direction of causality cannot be determined for these associations. An alternative interpretation is that individuals who have stronger intentions to gamble are more likely to have a positive attitude to gambling, watch televised sport that contains the promotions and be more receptive to the sponsor's messages. The effect is then more in relation to brand switching and this interpretation was supported by strong correlations between gambling intention and past gambling frequency and expenditure. However, PGSI scores were positively associated with gambling intention, more frequent sports viewing and receptiveness to gambling sponsor's messages, indicating that even with the alternative interpretation of the findings, gambling advertising in sport presents an increased risk for people experiencing problems with gambling. This is consistent with previous research that has found advertising is a trigger for people experiencing problems with gambling (Binde 2009; Grant & Kim 2001). A later exploratory study focussing on online gambling advertising (Hing, Cherney, Blaszczynski, Gainsbury & Lubman 2014), identified that the advertising invoked urges in people experiencing problems with gambling especially in response to bonus offers. However, the bonus offers (free bets) also, on occasion, increased consumption in recreational gamblers. This impact was not confined to direct advertising, with a further study (Hing et al. 2015a) identifying the sensitivity of sports bettors experiencing problems with gambling to indirect marketing and embedded promotions. Whilst both were exploratory studies, these findings warrant further examination at a population level or in an experimental setting to examine whether belief translates to behaviour.

1.3 A public health approach to gambling advertising and sport

In taking a public health approach to gambling, we consider not only the impact on the broader population but also whether particular groups within the population are more vulnerable to harm from exposure to all forms of gambling advertising. As with other potentially harmful products, the influence of gambling advertising and sponsorship of sport is of particular relevance in relation to vulnerable populations, such as youth and people already experiencing problems with gambling. There has been limited research into the impacts on youth from gambling advertising in sport. In order to obtain existing evidence from the literature, we conducted a search through Google Scholar in August 2017, using 18 different combinations of key words as listed in Figure 1. Note that we used not only “advertising”, but also “marketing” and “promotions” in this search, as these three words may all refer to or cover activities closely linked to advertising. Table 1 illustrates the few studies that emerged from this search process and it can be seen that methodologies varied across these studies. The remainder of this section will discuss a selection of these studies as well as a range of other studies that have led to the inception of the current project.

Key words used in the search through Google Scholar:

1. "gambling advertising in sport" youth; 2. "gambling advertising during sport" youth;
3. "gambling advertising in sport" child; 4. "gambling advertising during sport" child;
5. "gambling advertising in sport" adolescent; 6. "gambling advertising during sport" adolescent;
7. "gambling marketing in sport" youth; 8. "gambling marketing during sport" youth;
9. "gambling marketing in sport" child; 10. "gambling marketing during sport" child;
11. "gambling marketing in sport" adolescent; 12. "gambling marketing during sport" adolescent;
13. "gambling promotions in sport" youth; 14. "gambling promotions during sport" youth;
15. "gambling promotions in sport" child; 16. "gambling promotions during sport" child;
17. "gambling promotions in sport" adolescent; 18. "gambling promotions during sport" adolescent.

A total of 13 unique publications were identified. Browsing these publications indicated that 6 of them reported empirical data and findings relevant to the impacts on youth from gambling advertising in sport.

Figure 1 Search process that identified publications relevant to the impacts on youth from gambling advertising in sport

Table 1. Summary of studies relevant to the impacts on youth from gambling advertising in sport

Reference	Main aim	Sample and main method	Main finding
Thomas (2014)	To investigate how adults and children perceive and react to different gambling advertising strategies, including sports betting advertising.	59 adults (aged 30-60 years, median 47.7 years), 61 of their adolescent children (aged 14-18 years, median 16.4 years). Qualitative study. Melbourne, VIC.	Children were more likely than adults to discuss gambling in terms of 'luck' and 'chance' compared to 'risk', and more likely to focus on gambling outcomes of financial gain. Some participants (including children) also perceived gambling as 'easy', 'exciting' and 'fun' following viewing gambling advertisements.
Hing, Vitartas, Lamont, and Fink (2014)	To examine adolescent experiences with gambling promotions in televised sport and assess the relationship between these experiences and gambling intentions.	131 adolescents (aged 12-17 years, mean 14.9 years). Online survey. QLD.	Gambling intentions were positively correlated with the amount of televised sport viewed (among other variables). Being male and holding more favourable attitudes toward gambling promotions in televised sport emerged as two common predictors of stronger gambling intentions on sports or non-sport activities.
Hing, Vitartas, and Lamont (2014)	To investigate how gambling promotions in televised sport can affect engagement and problems with gambling.	Stage 2: 39 regular sports viewers (aged 18-60 years); Stage 3: 1000 adults (Panel 1, aged 18-over 85 years), 544 adult sports bettors (Panel 2, mean age 42.18 years), 131 adolescents (Panel 3, aged 12-17 years); Stage 4: 611 adults (aged 18-83 years). Mixed methods. QLD.	Gambling promotions in televised sport could lead to increased engagement and problems with gambling. These promotions might also cause increased future gambling (problems) among the adolescents.
Pitt, Thomas, Bestman, Stoneham, and Daube (2016)	To examine the recall of sports betting marketing among children and adults.	152 parent/child (aged 8-16 years, mean 10.8 years) dyads. Mixed methods. NSW and VIC.	91.4% of children and 98.0% of adults recalled ever seeing a sports betting promotion. Children recruited at AFL and NRL sites (vs. at soccer sites) were more likely to report having seen a sports betting promotion. 75.0% of children and 90.1% of adults thought that gambling in sport had become normalised.

Reference	Main aim	Sample and main method	Main finding
Pitt, Thomas, and Bestman (2016)	To investigate the perceptions of adolescents and parents about the effects on youth from gambling marketing in sport.	59 parents (median age 48 years), 61 adolescents (median age 16 years). Qualitative study. VIC.	Marketing could develop relationships between gambling and sport, shape the perception of gambling being part of sport, and drive the utilisation of gambling discourses in the discussion of sport.
Thomas, Pitt, Bestman, Randle, Daube, and Pettigrew (2016)	To examine the recall of children and parents (or caregivers) on gambling sponsorship of sporting teams.	152 children (aged 8-16 years), 152 parents (or caregivers, aged 29-71 years). Mixed methods. NSW and VIC.	Children were forming awareness of gambling as well as gambling marketing in sport.

The potential increased risk to people already experiencing problems with gambling from exposure to the advertising and ICBEs has already been highlighted in this section. However, similar concerns are held around the influence on youth, highlighted in the terms of reference for the Joint Select Committee on Gambling Reform (2013). These concerns are not without an empirical basis. In a meta-analysis of existing studies, Shaffer and Hall (1996) estimated that between 9.9% and 14.2% of adolescents are at-risk gamblers. A subsequent review found an average past-year gambling rate of 64% among youth from studies conducted in Australia and New Zealand since late 1990s (Volberg, Gupta, Griffiths, Ólason & Delfabbro 2010). Moreover, it has been found that young people are twice as likely as adults to have problems with gambling (Huang & Boyer 2007; Jackson, Dowling, Thomas, Bond & Patton 2008). Exposure to gambling advertising is associated with a greater likelihood of probable pathological gambling, as well as increased frequency of gambling (Clemens, Hanewinkel & Morgenstern 2017). Certain modes of gambling may also be disproportionately attractive for youths with gambling problems or, alternatively, may cause or exacerbate gambling problems in youths. For example, gambling more than once a month on fantasy sports is associated with problem gambling risk in adolescent high schoolers (Marchica, Zhao, Derevensky & Ivoska 2017). Young men are particularly at risk, with a relatively recent Canadian prevalence study identifying they are three times more likely to be at-risk gamblers than young women (Huang & Boyer 2007).

That young men are particularly at risk of harmful gambling is unsurprising when examining the proliferation of sports betting opportunities as sports viewership has traditionally been the domain of men. Gambling on sports has become entrenched in sports viewership and, subsequently, the idea that gambling is associated with masculine leisure pursuits has emerged (Smith & Raymen, 2016). Adolescent males have been shown to find gambling advertisements more exciting, interesting and relevant than their female counterparts and significant predictors of high PGSI scores in internet sports bettors include being young and male (Derevensky, Sklar, Gupta & Messerlian 2010; Hing, Russell, Lamont & Vitartas 2017) which may be due to gambling's association with masculinity. This may be especially the case in sports betting and this, in turn, is likely to result in young men being more likely than young women to implicitly associate sports with gambling.

A number of studies highlight the importance of the broader environment on gambling behaviour in youth. This is of particular relevance when the phenomena of the ICBEs created by sponsorship arrangements and other indirect forms of advertising sports betting are considered. Bellringer, Perese, Rossen, Tse, Adams, Brown, and Manaia (2003) argued that sports gambling advertising occurs in a broader environment that also contributes to the normalisation of the activity. This is especially the case for those that grow up in families or communities where gambling occurs often, for example, where raffles and bingo act as fundraising strategies for community organisations. Delfabbro and Thrupp (2003), in examining similar social determinants of gambling, also found that adolescents who had positive views of gambling reported their family and friends holding similar approving views. In addition, those adolescents that gambled frequently also reported having parents and friends who gambled a lot (Delfabbro & Thrupp 2003). More broadly, these findings are supported by Pitt, Thomas, Bestman et al. (2016) who found that 75% of the children in their sample believed that gambling on sport was normal.

1.3.1 Gambling advertising and youth

Beyond the immediate influence of family and close friends, children and youth have been found to be vulnerable to gambling advertising and promotions (Friend & Ladd 2009; Messerlian & Derevensky 2006). Korn, Hurson, and Reynolds (2005) found in their qualitative study of gambling and youth that every adolescent in their sample was familiar with gambling advertisements and

reported that gambling was commonplace amongst their various social circles. A qualitative study of 143 Canadian youth found that, through encountering seemingly personalised gambling adverts frequently and across multiple mediums, youth believed that they were targets for the gambling companies (Derevensky, Gupta, Messerlian & Mansour 2009). A subsequent empirical analysis (Derevensky et al. 2010) identified that 61% of youth reported receiving gambling advertisements through email and 96% had seen television advertisements for gambling. Despite most of the adolescents in the study claiming that they were aware of the persuasive intent of gambling advertising, a high percentage reported that viewing the adverts made them want to gamble (Derevensky et al. 2010). This was consistent with an earlier British study of youth in which 40% of participants identified advertising as their primary reason for gambling online (Griffiths & Barnes 2008). Similarly, a study examining youth and the influence of lottery or scratch ticket advertising found that 39% of adolescents reported having a greater intention to gamble after viewing lottery advertisements (Felsher, Derevensky & Gupta 2004). A New Zealand study also found that youth (15-24) were not only more likely to remember gambling advertising but there was an association between recall and participation in gambling (Amey 2001). Of further concern is a finding that youth identified with the gambling experiences presented in advertising well before they reached the age at which they can legally gamble (McMullan, Miller & Perrier 2012).

The exposure of youth to gambling advertising is not surprising given the large amounts of money that are spent advertising a variety of products to youth. It suggests corporate confidence that youth are active consumers of advertising. This is supported by the literature (Auty & Lewis 2004; Borzekowski & Robinson 2001). The influence of advertising has been identified in randomised control trials with children as young as two (Borzekowski & Robinson 2001). Whilst most children can discern between television content and advertising from the age of six (Levin, Petros & Petrella 1982), more recent studies show that changing the mode in which advertising is delivered, i.e. from television to web-based, is associated with an increased age at which children are able to correctly discern between content and advertising (Ali, Blades, Oates & Blumberg 2009). Whilst this research examined the medium of web pages, the findings raise concerns when considered in the context of ICBEs such as sponsorship. The findings of the Ali et al. (2009) study - which were consistent cross-culturally - also highlighted that children use cues such as pricing to discern an advertisement from content, and the increased impact of integration of the advertising. The absence of these cues in embedded and indirect advertising and the level of integration involved in sponsorship, such as naming rights or branding on uniforms, could reduce the ability for even older children to discern the difference between the advertising and the sport or team, creating an implicit association between the sponsor and the sport or team.

Even for older children, another aspect of risk was expressed by parents' reports that their children cannot differentiate between gambling promotions and sport coverage, especially with the use of sporting identities to promote the gambling products (Thomas 2014). Adolescents themselves within Thomas' (2014) study, reported concern about the use of sports identities in gambling advertising encouraging the view that gambling was just a part of the sport. In examining sports betting advertising, Thomas (2014) referred to a cultural capital that was being created between gambling and sport. The ability for people to bet throughout a game on different aspects contributed to this cultural capital so gambling became a continuous part of the game experience rather than a single bet on an overall outcome prior to the match starting. A relationship between gambling and team loyalty was apparent, with one adolescent participant reporting he gambled because it made him feel more connected to his sporting team, that it made you a better supporter and that you did not just watch your team anymore, you supported them by betting on them (Thomas 2014).

Gordon and colleagues' (2015) research on youth sports betting communities also highlighted not only the link between betting and team loyalty, but its importance in group bonding and acceptance. The descriptions by participants of the combined activity of watching sport and betting showed strong associations between the two activities (Gordon, Gurrieri & Chapman 2015). This was consistent with McMullan et al.'s (2012) earlier findings around cultural capital, social friendship and entertainment from gambling participation. A Queensland survey of 131 adolescents also found that those expressing the greatest intention to gamble on sports were males that perceived their friends and family as having positive views of sports betting, and who watched a large amount of televised sport (Hing et al. 2013). Intention to gamble and the perception of gambling as a positive and socially acceptable behaviour may lead to an increase likelihood of harm from gambling later in life. In fact, it has been shown that adult problem gamblers are more likely to be influenced by perceived cultural norms around sports betting and are more likely to express an intention to bet on sports in the future (Hing, Lamont, Vitartas & Fink 2015b).

The links between gambling and supporting the team are consistent with earlier research by Korn et al. (2005) where youth reported that participation in gambling increased the excitement about the game and was seen as demonstrating support for the team. Similar findings have been noted with alcohol advertising with sport which promotes consumption as enhancing the sports experience (Lamont et al. 2011). Concern has also been raised about the emerging link between team loyalty and brand loyalty to the gambling provider, that is, if you follow the team you will follow the betting company (Thomas 2014). Thomas (2014) found evidence that links between sport and gambling were implicitly made, even when gambling was not explicitly mentioned. It is this last finding that the current research project seeks to test empirically.

A further emergent area of concern with regards to the pervasive nature of advertising is in relation to the use of social media. Advertising via social media sits outside the current legislative frameworks and relies on voluntary codes of practice. To date, public health literature has tended to focus on traditional media advertising, as well as the traditional indirect marketing activities such as sponsorships and experiential marketing. Research into the use of social media in relation to alcohol advertising has identified it as a mechanism of marketing (Mart, Mergendoller & Simon 2009; Nicholls 2012), consumer identity (Moreno, Briner, Williams, Brockman, Walker & Christakis 2010; Ridout, Campbell & Ellis 2012) and normalisation (Griffiths & Casswell 2010), of which some was initiated by the company (Mart 2011) and some by consumers (Moreno, Christakis, Egan, Brockman & Becker 2012). The previously highlighted concerns around the lack of cues and product integration apparent in online advertising, and the confusion that this can create for children, have also been identified in early research on the impact of social media strategies for advertising. In a content analysis of social media content, Nicholls (2012) found that a raft of consumer engagement strategies were used, such as real world tie-ins, competitions, interactive games and time specific suggestions, to stimulate consumption. An exploratory study into social media use as an advertising platform in Australia identified the use of strategies such as embedded gambling content mixed with other news and events (including linking to sport), the normalisation of gambling including positively framed messages highlighting winning, cross promotional tactics and the absence of harm minimisation or responsible gambling information (Gainsbury, Delfabbro, King & Hing 2016). This combination of strategies and the lack of cues that traditional advertising modalities contain raises concern around the impact of this type of gambling advertising on children, especially in terms of creating implicit associations between gambling and sport, and positive attitudes towards gambling stemming from a higher degree of gambling normalisation.

The key barrier to the effectiveness of regulatory approaches for social media has been identified as a flawed conceptual basis that positions marketing and advertising communication as being only produced by the brands (Brodmerkel & Carah 2013). The move to what Brodmerkel and Carah

(2013) describe as culturally embedded processes where content is co-created by both the brand and the consumer not only creates challenges from a regulatory perspective, but also embeds the brand in the cultural practices of the consumers. This embedding or integration was identified as contributing to the implicit association created between brand and activity, such as gambling and sport. Hence, through the practice of content co-creation youth may actually be contributing to the associations between betting and sport.

This phenomenon of consumer created (or co-created) advertising content links with the research by Gordon et al. (2015) that positions sports betting in the context of a lifestyle consumption community (LCC) consistent with consumer culture theory (Närvänen, Kartastenpää & Kuusela 2013). Gordon et al.'s (2015) research highlighted the social nature of sports gambling whilst watching the sport (in person or televised) where betting becomes part of the discussion and experience around the game, creates peer pressure to become involved and forms part of their identity as a supporter. However, Gordon et al. (2015) did not separate the interaction and discussion that was shared through social media as consumer created content.

1.3.2 Sponsorship, advertising and sport

Lamont et al. (2011) noted that advertising and sponsorship of sport has long been used by products that have the potential to contribute to problems with population health, such as tobacco, alcohol and high fat, salt and sugar (HFSS) food. Similar to gambling, the alignment of these products with sport created opportunities to achieve a large market reach and to key target demographics (Cousens, Babiak & Bradish 2006). This association with sport has also led to the normalisation of the consumption of these products (Smith & Raymen 2016). Comparisons have been made between gambling and the public health issues associated with the above products (Maher, Wilson, Signal & Thomson 2006) and researchers have identified the parallels between the products and the tactics used to market them. Thomas (2014) notes similarities in advertising imagery between all of these products, including that of glamour, fun and social connection. Whilst there are similarities between sports sponsorship by these different products, there are also important differences that must be considered. For the other products, the association with sport created the imagery of them being a part of a lifestyle, whereas for gambling products the association is for them to become part of the game experience.

Whilst a number of lessons can be drawn by examining the evidence from these other products, it is also necessary to highlight the important differences around the consumption of gambling, tobacco, alcohol and HFSS food. First and foremost, tobacco has an important difference to other products. Unlike alcohol and HFSS food, there is no safe level of tobacco consumption. Gambling is viewed as a product that can be consumed at non-harmful levels, similarly to alcohol and HFSS food, and therefore any policy response in relation to gambling should be in that context. However, unlike alcohol and HFSS food, determining or advising of safe levels of gambling has not yet been addressed.

Tobacco

Tobacco advertising was banned from television in Australia in 1976, yet by 1980 the top three sponsors in Australian sports were the three largest tobacco companies (Richards 2017). This highlights the value of indirect advertising techniques in avoiding legislative restrictions. Despite the introduction of the Tobacco Advertising Prohibition Act 1992, sport in Australia did not become 100% free of tobacco sponsorship until October 2006, 14 years following the prohibition (Richards 2017).

Similarly to findings on gambling advertising, exposure to tobacco advertisements is associated with more positive views of the behaviour (Henriksen, Flora, Feighery & Fortmann 2002). A 2006 review of the literature on tobacco advertising and its effect on youth found that exposure to advertisements led to a greater risk of smoking initiation (DiFranza, Wellman, Sargent, Weitzman, Hipple & Winickoff 2006). DiFranza et al. (2006) found there was a dose-response relationship to tobacco advertisements, with those that were exposed to more advertising being more likely to become smokers. This effect held even when controlling for other factors that are known to be associated with smoking initiation, such as familial and peer smoking and socioeconomic status (DiFranza et al. 2006). In addressing smoking behaviours in youth, anti-smoking public health campaigns aimed at youth do appear to be effective in changing attitudes and intentions (Pechmann & Reibling 2006). However, of concern in terms of gambling advertising and in contrast to anti-smoking campaigns, Thomas (2014) showed that gambling harm minimisation messages shown during sports telecasts that focus on non-harmful consumption are not recalled by youth.

Alcohol

Alcohol advertising and sponsorship in sport in Australia is an ongoing public health concern (Dobson 2012; Smith & Foxcroft 2009). However, alcohol is inextricably linked with sport. Every major sporting event in Australia has at least one major alcohol sponsor and, in some cases such as the annual Australian one-day cricket series, more than one alcohol brands are major sponsors (Jones 2010). Concerns have also been raised about the amount of alcohol advertising children in Australia are exposed to during daytime sports telecasts (O'Brien, Carr, Ferris, Room, Miller, Livingston, Kypri & Lynott 2015). Two systematic reviews of longitudinal studies, that have measured exposure and subsequent drinking behaviours, found that there was a dose-response relationship and concluded that exposure to alcohol advertising contributed to increased initiation of alcohol consumption and volume of alcohol consumed, including binge and hazardous drinking (Anderson, de Bruijn, Angus, Gordon & Hastings 2009; Jernigan, Noel, Landon, Thornton & Lobstein 2017).

Specific research findings identify the mechanisms of this relationship between exposure to advertising and subsequent patterns of alcohol consumption. As with tobacco, research has shown that exposure to alcohol advertising leads to more positive views of alcohol and increased intention to drink (Grube & Wallack 1994; Snyder, Milici, Slater, Sun & Strizhakova 2006). Moreover, it has been found that exposure to alcohol marketing leads to an increased likelihood of alcohol consumption both in the short term and in the long term. A large study of over 2,000 seventh grade children (12-13 year olds) examined the alcohol use and exposure to alcohol advertising at two time points one year apart. Results showed that each standard deviation increase in viewing television programmes that included alcohol advertisement resulted in an increase in the likelihood of consumption of alcohol and in consuming three or more alcoholic drinks in one occasion in eighth grade. This relationship existed even when controlling for a multitude of potential confounders, including general television viewing and peer and family drinking habits (Stacy, Zogg, Unger & Dent 2004).

Of value when using alcohol advertising in sport to examine the potential ramifications of gambling advertising in sport are the longitudinal studies that have looked at the impact on youth. One such study examining 15 to 26 year olds found that for each \$1 per capita spent on alcohol marketing, youth in that area drank 3% more (Snyder et al. 2006). When examining only those under the legal drinking age at the outset of the study (21 years in this study), those in jurisdictions with more alcohol advertising increased the amount of alcohol they drank until their late-20s. Conversely, in those that lived in areas with less alcohol advertising, the amount of alcohol consumed plateaued over that time (Snyder et al. 2006). A European longitudinal study examined younger children,

following up 10,259 respondents from a sample of 12,464 pupils with a mean age of 13.5 years at baseline (Morgenstern, Sargent, Sweeting, Faggiano, Mathis & Hanewinkel 2014). Alcohol marketing receptivity was measured by asking children if they had a favourite alcohol advertisement and what brand it was about. Results showed that there was a relationship between alcohol marketing receptivity, and both binge drinking at baseline and its initiation within the one-year follow-up period, after a variety of factors had been controlled for. Morgenstern and colleagues (2014) speculate that the advertising strategy used by alcohol companies creates a brand identity that may attract youth. Similarities can be found between this and Gordon et al.'s (2015) assertion that gambling advertising contributes to the creation of a lifestyle consumption community, where gambling becomes synonymous with the enjoyment of sport. Smith and Raymen (2016) also argue that the dominant message promoted by gambling brands is that gambling on sport is part of one's lifestyle and identity, similar in the way that one's hobbies or interests define the self. In seeing this dominant advertising message, it is likely that youth will view those gambling brands that are associated with sports in a positive light.

Whilst some sports in Australia have chosen to cut their ties with alcohol sponsorship, replacing it with public health campaigns, the three most highly viewed sports are still heavily supported by alcohol marketing (AAP 2012). In Australia a study examining the alcohol, gambling and unhealthy food marketing strategies across the three games of the 2012 State of Origin rugby league series found that alcohol marketing far exceeded that of any other risky product (Lindsay et al. 2013). There were 1354 episodes of advertising content, translating to 66.29 minutes of alcohol marketing across the 360 minutes of coverage (Lindsay et al. 2013). Subsequent research by O'Brien et al. (2015) also identified large amounts of alcohol advertising during daytime sports events watched by children and youth. Of further concern are the findings of a systematic review with regards to the alcohol industry's self-regulation, which appears to be ineffective (Noel, Babor & Robaina 2017).

The relative lack of public outcry and will on behalf of policy makers to introduce legislation to restrict alcohol promotion in sport reflects the normalisation of alcohol in sport, which raises significant concerns around the normalisation of gambling in relation to sport. Alcohol has a far longer association with sports in Australia than does gambling, and the association of alcohol with both elite sports and with low level community sports is pervasive across society. This may foreshadow the development of the relationship between sport and gambling.

High fat, salt and sugar (HFSS) food

HFSS food advertising to children is also an emergent, controversial and emotive topic, like gambling. However, unlike gambling advertising, there have been considerable empirical data gathered over the last two decades in relation to the issue. What is similar to tobacco and alcohol advertising are the findings that advertising does have an impact on consumption. In a within subjects study examining the effectiveness of television food advertisements, children were shown advertisements for food products on one occasion, and for non-food related products on another. After viewing the food advertisements, children ate significantly more unhealthy food and more food overall when offered unlimited snacks (Halford, Gillespie, Brown, Pontin & Dovey 2004). It is not only the potential short-term effects of HFSS food advertising that is of most concern to public health officials; it is the link between the advertising and the growing rate of childhood obesity that is the main focus of policy makers. Similar to gambling advertising, it is difficult to disentangle causality in terms of the viewing of HFSS food advertisements, the associated screen time and childhood obesity. However, in terms of HFSS food advertising, a cautious approach is being taken by many jurisdictions, imposing restrictions on this type of advertising to children. For example, advertisements that promote HFSS products have recently been banned from children's non-broadcast media in the United Kingdom (CAP News 2017).

Like tobacco in the 1990s, sponsorship by HFSS food companies has again provided a means of circumventing any restrictions to direct advertising. Sports events, where there are a large number of youth in the audience, are still dominated by HFSS sponsorship. For example, McDonald's and Coca Cola are two of the 12 major Olympic sponsors and the London 2012 Olympic Games was the most highly viewed television event in broadcast history (International Olympic Committee 2012).

1.3.3 Difficulties in assessing the link between advertising and health outcomes

In assessing the evidence on the relationship between advertising and sports sponsorship by other risky products such as tobacco, alcohol and HFSS food and consumption, there is a common limitation present. This is the inability of many studies to isolate the impact of a single influence, since they are part of a complex environment of interacting factors. This is also a further restriction in developing an evidence base for advertising and gambling in that it has been necessary for studies to focus on one aspect or mechanism of the relationship that can be isolated and examined empirically, such as brand awareness. A number of studies were able to demonstrate a strong association between sponsorship and brand awareness and link experimentation or uptake with the association between sponsorship and brand awareness (Amey 2001; Herrmann et al. 2014; Ledwith 1984). However, brand awareness can be seen as a very surface type of measure that lacks scientific rigour and evidence for use as a proxy. Recent gambling research examining adolescents has used amount of televised sports watched as a measure of exposure to gambling advertising, with results showing that intention to gamble was positively correlated with this measure (Hing, Vitartas, Lamont & Fink 2014). However, this too is a proxy measure and is subject to reporting errors. The remainder of this section will expand on the above mentioned limitations of the research to date and discuss the role of the Implicit Association Test (IAT) in potentially adding credibility to the field of gambling advertising research.

1.4 The role of the IAT in understanding the influences of gambling advertising in sport

Lamont et al. (2011) identified the lack of empirical research in this area as hampering the development of robust, evidence based policy around gambling advertising and sponsorship of sport. The paucity of research in the area is in part due to the challenges it presents to the conduct of ethical and valid research. Conducting a randomised controlled trial to determine the impact of exposure to gambling advertising is contrary to the requirements of ethically sound research, due to the necessity to expose participants to a factor that could cause harm. Conversely, observational methodologies cannot account for, or measure, all the potential factors of influence. Consistent with efforts to examine other products of public health concern in relation to the impact of their advertising and sponsorship of sport, it is appropriate to focus on one aspect or mechanism of the relationship at a time that can be isolated and examined empirically.

Of particular interest to the present project is to assess the associations between gambling and sport, a potential mechanism underlying the influences of gambling advertising in sport. The IAT emerges as an ideal tool to serve this purpose. Originally introduced by Greenwald, McGhee, and Schwartz (1998), the IAT can be adapted and utilised to measure the strengths of associations/relationships between various concepts in people's mind. Importantly, the IAT can not only gauge associations that exist outside (as well as within) the conscious awareness, but it may also serve as a useful tool in assessing stigmatised topics and understanding attitudes about risky

behaviours (Brunel, Tietje & Greenwald 2004). These advantages of the IAT make it a particularly suitable measure for the present project, since the influences of gambling advertising in sport should be, at least to some degree, a nonconscious process, a stigma-related topic, or a driver of potentially harmful behaviours among the Australian youth population. In other words, young people might not be consciously aware of, or might not want to admit the impacts of gambling advertising in sport. Employing the IAT technique can help address both issues. The details of this technique will be presented in next section.

Approach

2.1 Research design

The present project aimed to assess the influences of sport-related gambling advertising on both adolescents and young adults, through a combination of experimental and survey approaches. First, we examined whether young people implicitly associated gambling with sport, by utilising the IAT technique (Greenwald et al. 1998; Greenwald, Nosek & Banaji 2003). The IAT is arguably an ideal measure of the effectiveness of advertising in creating a 'natural' connection between people's knowledge representations about different concepts (i.e., gambling and sport in the current case). For the selection of stimuli to be used in our IAT, we considered two broad types of gambling activities, those with clear relationships to sport (e.g., sports betting), along with other gambling activities which have little relevance to sport (e.g., electronic gaming machine (EGM) gambling). We also considered two broad types of sport, including those sports in which betting and gambling advertising is intense (e.g., rugby league), and other sports in which betting is less prevalent (e.g., gymnastics). Accordingly, participants from both age groups were randomly assigned to complete one of four versions of IAT, based on a 2 (types of gambling) × 2 (types of sport) between-subjects experimental design. Thus, we could determine both proximal (e.g., between sports betting and rugby league) and distal (e.g., between EGM and gymnastics) associations between the conceptual domains of gambling and sport through the IAT experiment. In addition to the experiment, we also employed a self-report survey questionnaire that included questions related to gambling, sport viewing, and demographic background. Both the IAT experiment and the survey were developed and administered through Inquisit Web, a software that allows online collection of questionnaire data as well as behavioural data such as response time.

2.2 Methods

2.2.1 Recruitment of participants

Qualtrics, a company who has access to Australian online panels, recruited participants aged between 18 and 24 and participants aged between 14 and 17 for this project. As the recruitment criteria varied for participants who have reached 18 years old and for those aged below 18, two separate study links were constructed, one for each age group. As for the 18 and above age group, the recruitment criteria included being an Australian resident aged between 18-24 and being available to participate in a research study on a computer that would take approximately 10-15 minutes to complete. Those potential participants who satisfied both criteria were presented the participant information statement and the participant consent form. They were only directed to start the research tasks after they had given consent to their participation. As for participants in the below 18 age group, their parents were first asked three recruitment criterion questions, including if they were an Australian resident, if they had a child who was an Australian resident aged between 14-17, and if that child was available to participate in a research study on a computer that would take approximately 10-15 minutes to complete. Once those parents had responded positively to all three questions, they were presented the participant information statement and the participant consent form. Only after they had explained the information to their child and given consent to the participation of their child in the research project, their child was asked to start the research tasks. Participants from both age groups were allowed to withdraw from this project at any time (before completing all research tasks). However, withdrawal of data (once submitted) was not possible as individual contributions were not identifiable. Ethics approval was granted to the project by the CQUniversity Human Research Ethics Committee (approval number: H15/09-209).

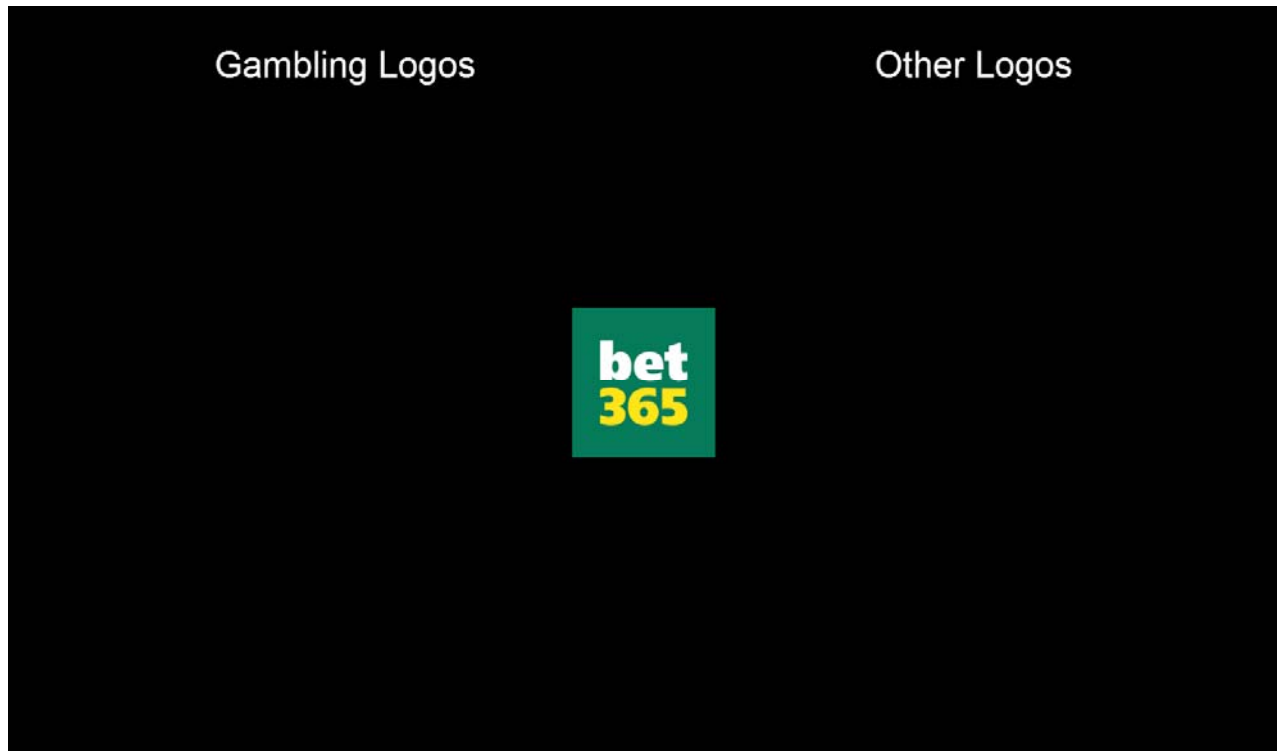
2.2.2 First research task: the IAT

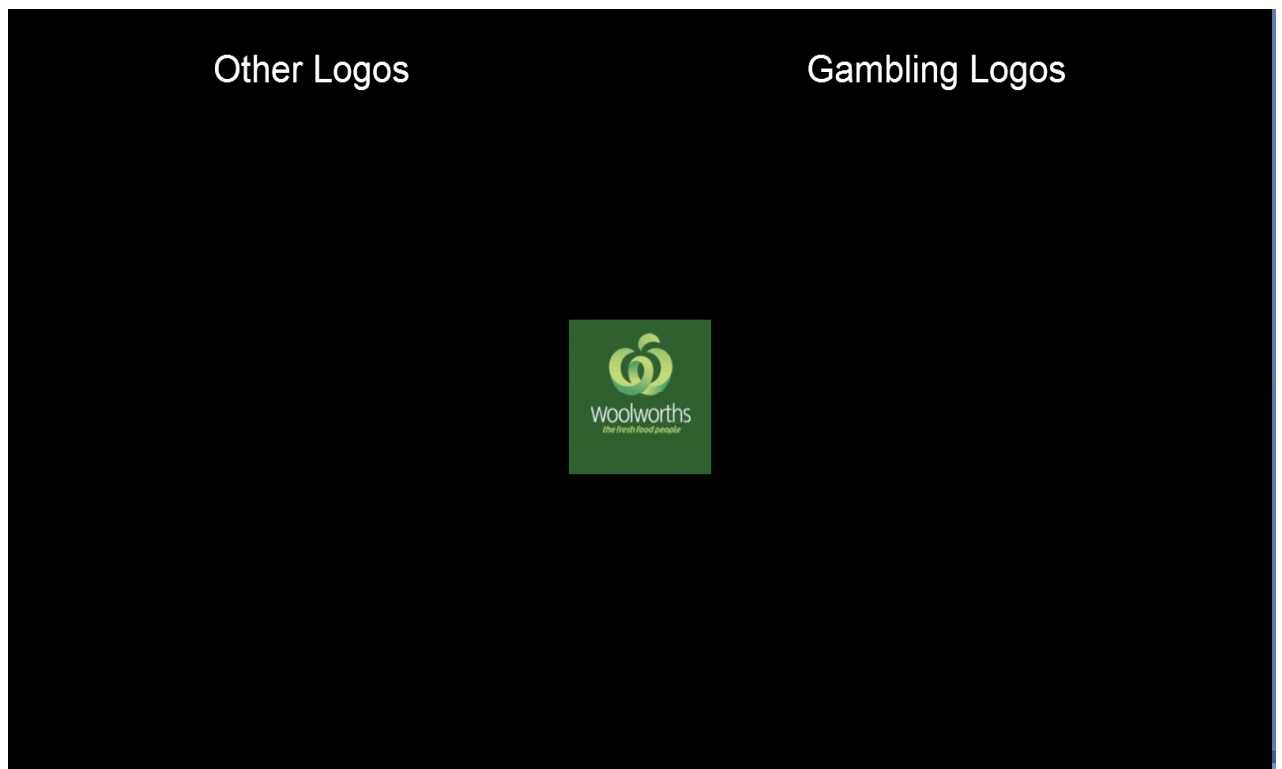
In this first task, participants from both age groups were randomly assigned to one of four conditions based on a 2 (types of gambling: sport-relevant vs. sport-irrelevant) × 2 (types of sport: gambling-relevant vs. gambling-irrelevant) between-subjects design. The IAT asked participants to classify pictures into either “gambling logos” or “other logos” and classify named words into either “sports” or “hobbies”. Specifically, participants were assigned to view logos for gambling companies who ran/manufactured sport-relevant or sport-irrelevant gambling games, and names for sports that were relevant or irrelevant to gambling in Australia. Furthermore, across all four conditions, participants viewed logos for companies who did not operate in the gambling industry and names for hobbies that did not involve sporting elements, which served as baseline for comparisons to gambling logos and sport names. Please see Table 2 for the list of stimuli for the IAT.

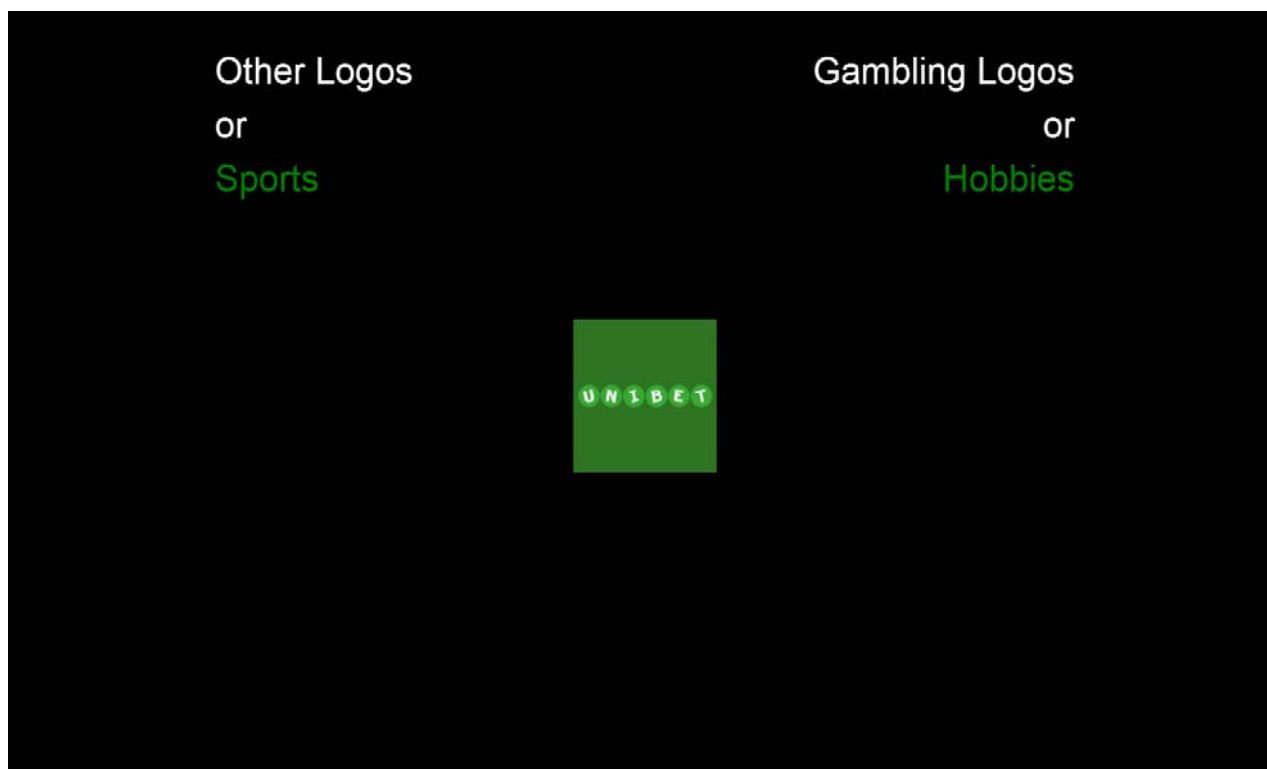
Table 2. List of stimuli for the IAT

Pictures:	
Sport-relevant gambling logos:	TAB; Centrebet; Tom Waterhouse; bet365; Unibet; Luxbet.
Sport-irrelevant gambling logos:	Oz Lotto; Powerball; Super 66; Keno; Aristocrat; IGT.
Other logos:	Woolworths; BHP Billiton; GE; Intel; Boeing; Nestlé.
Words:	
Gambling-relevant sports:	Rugby League; Rugby Union; Australian Rules; Cricket; Soccer; Basketball; Horse Racing; Motor Racing.
Gambling-irrelevant sports:	Gymnastics; Archery; Weightlifting; Marathon; Triple Jump; Discus Throw; Pole Vault; Figure Skating.
Hobbies:	Painting; Photography; Creative Writing; Reading; Crossword Puzzles; Watching Movies; Pottery; Fashion Design.

During the IAT, all participants went through a number of trials. In each trial, they saw category names presented on the left-hand and right-hand side of the screen (e.g., “gambling logos” on the left; “other logos” on the right; see Figures 2-6 for some screenshots of the IAT as the examples), as well as a word or picture stimulus in the centre of the screen (e.g., a picture of a gambling logo in the centre; see Figures 2-6 for some examples). They clicked on a left key (i.e., the “E” key) or a right key (i.e., the “I” key) to indicate whether the stimulus belonged to the category on the left or right. Following the suggestions by Greenwald et al. (2003), participants completed seven blocks of IAT trials (see Table 3), which reduced the potential order effects that could bias the results.







Figures 2-6 Some screenshots of the IAT in the sport-relevant gambling and gambling-relevant sport condition

Table 3. Descriptions of the seven blocks in the IAT

Block	Number of trials	Category on the left	Category on the right
1	20	gambling logos	other logos
2	20	sports	hobbies
3	20	gambling logos; sports	other logos; hobbies
4	40	gambling logos; sports	other logos; hobbies
5	20	other logos	gambling logos
6	20	other logos; sports	gambling logos; hobbies
7	40	other logos; sports	gambling logos; hobbies

Note: For half of the participants, the positions of Blocks 1, 3, and 4 were switched with those of Blocks 5, 6, and 7 respectively.

2.2.3 Second research task: the online survey

Once the participants had completed the IAT, they were presented a series of questions through an online survey. They were all first asked questions from the Attitudes Towards Gambling Scale (ATGS; Orford, Griffiths, Wardle, Sproston & Erens 2009), a scale that had been confirmed as a valid indicator of gambling attitudes among research participants in Australia (Donaldson, Rockloff, Browne, Sorenson, Langham & Li 2016). Next, participants responded to questions on their amount of sport viewing (adapted from Sproston, Hanley, Brook, Hing & Gainsbury 2015). Then they were asked to indicate their intentions to gamble once they were 18 years old (for participants in the below 18 age group), or in the next 12 months (for participants in the 18 and above age group), based on questions adapted from Sproston et al. (2015). Participants in the 18 and above age group were also required to answer questions from the Problem Gambling Severity Index (PGSI; Ferris & Wynne 2001), a measure that had been frequently featured in previous gambling studies (e.g., Browne, Langham, Rockloff, Li, Donaldson & Goodwin 2015; Li, Browne, Rawat, Langham & Rockloff 2017; Rockloff, Browne, Li & O'Shea 2014). In addition, all participants answered questions on their demographic background (i.e., age, gender, household income, education, cultural background, English proficiency, state/territory they lived in), and indicated their level of agreement with the statement 'Gambling advertising is created to persuade' (adapted from van Noort, Antheunis & van Reijmersdal 2012).

Results

3.1 Results from descriptive analysis

The experimental and survey data for this project were retrieved through Inquisit Web and aggregated into a single data file. A total of 1,119 participants in the below 18 age group, and 1,004 participants in the 18 and above age group started their online participation. As the full IAT task included 180 trials across seven blocks, we deleted all participants who did not complete exactly 180 trials, which reduced the total subject pool from 2,123 to 1,967. Participants who failed to complete the survey were also excluded, as were participants who nominated an age above 24, reducing the subject pool to 930 in the 18 and above age group (618 female) and 915 in the below 18 age group (447 female), with 332,100 associated individual IAT trials.

Table 4 presents the key profile of participants in the two age groups. As for participants in the 18 and above age group, their ages were relatively equally distributed across all years between 18 and 24 (ranging from 12% to 18% approximately), whereas participants in the below 18 age group were mainly concentrated between 14 and 16 (totalling around 84%). For both age groups, the majority of participants reported a household income below \$100,000, accounting for 71% and 61% of the older and younger participants. Due to their age differences, the two groups varied dramatically in terms of education: 55% of the older participants, as compared to 98% of their younger counterparts, belonged to the demographic with Year 12 or below as the highest level of completed education. Despite such differences, they reported similar cultural background (over 70% from both groups most identified with Australian culture), English proficiency (over 85% from both groups indicated their proficiency as excellent), and residential location (over 70% from both groups lived in New South Wales, Victoria, or Queensland).

According to the outcome of summing up participants' responses on the ATGS items, more than 50% of participants from both age groups held negative attitudes towards gambling (i.e., had an ATGS score lower than 42; Orford et al. 2009). 'Less than once a month' was the most reported frequency of watching sporting events at a sports ground or on TV in the last 12 months (accounting for 27% of older and 19% of younger participants). Bigger proportion of participants below 18 (38%), compared to those 18 and above (23%), watched sports at least once a week (i.e., reported 'about once a week', '2-3 times a week', or '4 or more times a week'). Among participants who had reached 18 years old, 82% indicated that they were unlikely or very unlikely to take part in sports betting in the next 12 months. Similarly, 84% of participants below 18 would be unlikely or very unlikely to gamble on sports once they turned 18 years old. Moreover, over 80% of participants from both age groups agreed or strongly agreed with the statement 'Gambling advertising is created to persuade'. Lastly, 81% of participants between 18 and 24 had a PGSI score not above 2, suggesting they had no gambling problems, or just low-level problems (Ferris & Wynne 2001).

Table 4. Key profile of participants in the 18 and above age group (N = 930) and the below 18 age group (N = 915)

Features	n (18 and above)	% (18 and above)	n (below 18)	% (below 18)
Gender:				
Male	312	33.5	468	51.1
Female	618	66.5	447	48.9
Age:				
14			228	24.9
15			290	31.7
16			246	26.9
17			151	16.5
18	166	17.8		
19	114	12.3		
20	145	15.6		
21	115	12.4		
22	113	12.2		
23	155	16.7		
24	122	13.1		
Household income:				
\$0 to \$49,999	342	36.8	250	27.3
\$50,000 to \$99,999	319	34.3	306	33.4
\$100,000 to \$149,999	159	17.1	230	25.1
\$150,000 to \$199,999	55	5.9	86	9.4
\$200,000 or more	55	5.9	43	4.7
Highest level of completed education:				
Did not go to school	0	0.0	2	0.2
Year 12 or below	515	55.4	894	97.7
Trade Certificate	122	13.1	8	0.9
Bachelor Degree	231	24.8	7	0.8
Masters Degree	32	3.4	0	0.0
Doctoral Degree	4	0.4	2*	0.2
Other	26	2.8	2	0.2
Cultural background most identified with:				
Australian	695	74.7	719	78.6
Other	235	25.3	196	21.4
English proficiency:				
Poor	4	0.4	5	0.5
Fair	12	1.3	17	1.9
Good	78	8.4	114	12.5

Features	n (18 and above)	% (18 and above)	n (below 18)	% (below 18)
Excellent	836	89.9	779	85.1
Residential state/territory:				
New South Wales	268	28.8	258	28.2
Victoria	254	27.3	250	27.3
Queensland	185	19.9	160	17.5
Western Australia	108	11.6	110	12.0
South Australia	80	8.6	87	9.5
Tasmania	19	2.0	35	3.8
Australian Capital Territory	11	1.2	9	1.0
Northern Territory	5	0.5	6	0.7
ATGS score:				
< 42	518	55.7	478	52.2
= 42	52	5.6	54	5.9
> 42	360	38.7	383	41.9
Frequency of watching sports at ground or on TV in last 12 months:				
Never	216	23.2	170	18.6
Less than once a month	246	26.5	176	19.2
About once a month	133	14.3	102	11.1
2-3 times a month	121	13.0	119	13.0
About once a week	88	9.5	165	18.0
2-3 times a week	82	8.8	144	15.7
4 or more times a week	44	4.7	39	4.3
Intention to gamble on sports betting in next 12 months:				
Very unlikely	613	65.9		
Unlikely	150	16.1		
Likely	114	12.3		
Very likely	53	5.7		
Intention to gamble on sports betting once 18 years old:				
Very unlikely			557	60.9
Unlikely			207	22.6
Likely			133	14.5
Very likely			18	2.0
Agreement with 'Gambling advertising is created to persuade':				
Strongly agree	331	35.6	425	46.4
Agree	417	44.8	326	35.6
Neither agree nor disagree	150	16.1	130	14.2

Features	n (18 and above)	% (18 and above)	n (below 18)	% (below 18)
Disagree	17	1.8	14	1.5
Strongly disagree	15	1.6	20	2.2
PGSI				
0 (No identifiable problems)	585	62.9		
1–2 (Low-risk)	167	18.0		
3–7 (Moderate-risk)	83	8.9		
8 or more (problem gamblers)	95	10.2		

* Two cases of implausible response options selected. Subsequent analysis was re-done in order to confirm that excluding these cases did not affect any substantive outcomes of analysis. Given that education did not play a role in our analysis, these two cases were retained.

3.2 Results from linear mixed effects models

Following the ‘conventional algorithm’ of Greenwald et al. (2003, Table 4), IAT trials were excluded if the reaction time was shorter than 300ms, or longer than 3000ms. Further, trials selected for the purpose of main analysis were from Blocks 3, 4, 6, and 7 (see Table 5), as those blocks included congruent trials (i.e., when categories of gambling logos and sports were on the same side of the screen simultaneously) as well as incongruent trials (i.e., when categories of gambling logos and sports were on different sides of the screen simultaneously). This yielded 187,635 trials suitable for analysis (see Table 6 for the total number of trials for each condition). The response variable was the natural log transform of latency, which was approximately normally distributed with moderate positive skew ($B = .83$). Inspection of the histogram implied a homogenous population of trials, with no evidence of outliers.

Table 5. Descriptions of the seven blocks in the IAT (This table has appeared in last section, it appears here again for readers’ convenience)

Block	Number of trials	Category on the left	Category on the right
1	20	gambling logos	other logos
2	20	sports	hobbies
3	20	gambling logos; sports	other logos; hobbies
4	40	gambling logos; sports	other logos; hobbies
5	20	other logos	gambling logos
6	20	other logos; sports	gambling logos; hobbies
7	40	other logos; sports	gambling logos; hobbies

Note: For half of the participants, the positions of Blocks 1, 3, and 4 were switched with those of Blocks 5, 6, and 7 respectively.

Table 6. Total number of trials available for analysis

2 × 2 between-subjects design:		Types of sport:	
		Gambling-relevant	Gambling-irrelevant
Types of gambling:	Sport-relevant	47519	47382
	Sport-irrelevant	45916	46818

Analysis was conducted in the R statistical programming environment, using the *lme4* package (Bates, Mächler, Bolker & Walker 2015) to implement linear mixed effects (LME) models. LMEs are a generalisation of ordinary regression, and were required in the present instance to handle repeated measures, and also to account for the fact that experimental effects may vary from person to person. Nevertheless, our main interest was in the ‘fixed effects’. The primary experimental effect was a binary contrast between congruent and incongruent trials (hereafter *c-i-contrast*), which captured the implicit association between gambling and sport. As well as fixed effects, each LME included crossed and correlated random intercept and slope effects for *c-i-contrast*, nested within subject ID and stimulus ID factors. *C-i-contrast* also featured as a fixed effect, which is a typical specification in LMEs, with between subject effect variability occurring around a sample fixed (mean) effect. This accounted for individual differences in reaction times, and also potential varying experimental effects among subjects and stimuli. We tested for significant effects via model comparison using chi-square tests of the change in log-likelihood when adding or dropping terms.

The mean latency among congruent trials was 846ms, as compared to 1068ms among incongruent trials, a significant difference: $\chi^2(1) = 146.12, p < .0001$. That is, across both age groups, there was a stronger association between gambling and sport than their respective associations with the control stimuli. In other words, gambling and sport appeared to have become connected concepts in participants’ minds: the presence of one of them (e.g., a soccer match), could facilitate fluency in making decisions about the other (e.g., a gambling company logo advertisement), compared to concepts less connected to them (e.g., a mining company logo advertisement). Figure 7 compares the *c-i-contrast* effects for the 2 × 2 between-subjects design: gambling-(ir)relevant sport name by sport-(ir)relevant gambling logo. The strongest effect for *c-i-contrast* was observed in the gambling-relevant, sport-relevant condition.

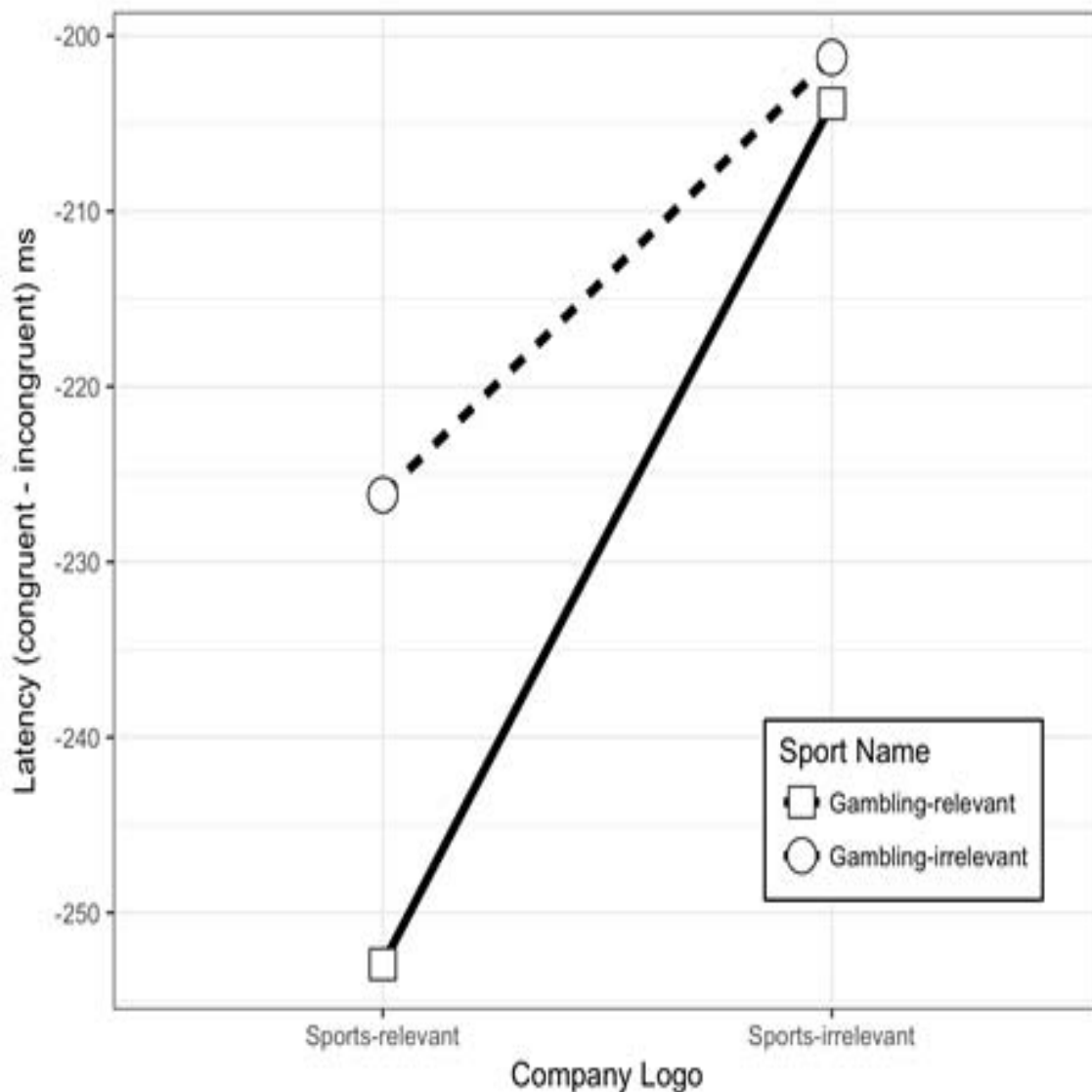


Figure 7. The *c-i-contrast* effects for the four conditions of the 2 × 2 between-subjects design

Note: The analysis DV was always log-latency. Figure 7 and Figure 8 display it differently (subtracting means) to make it easier to understand visually.

To test for differential *c-i-contrast* effects between the 2 × 2 experimental conditions we compared two models. Each model predicted the log-latency, incorporating fixed experimental effects for the four experimental conditions. The alternative hypothesis was that the *c-i-contrast* effect (i.e. differential reaction time) depended on the condition. Crossed random effects were included for subject ID and stimulus ID, with an intercept and random slope for the *c-i-contrast* effect. Thus, the models accounted for both mean differences in reaction time between subjects and stimuli, and also variation in the experimental effects. The models are denoted below:

$$M0: \text{loglat} \sim \text{cicontrast} + \text{gambling} * \text{sport} + (1 + \text{cicontrast}) | \text{subID} + (1 + \text{cicontrast}) | \text{stimID} + e$$

$$M1: \text{loglat} \sim \text{cicontrast} * \text{gambling} * \text{sport} + (1 + \text{cicontrast}) | \text{subID} + (1 + \text{cicontrast}) | \text{stimID} + e$$

The residual error and random effects variances were virtually identical between models, and the values relevant to M1 are summarised in the table below.

Table 7. Values relevant to the random effects and the residual error for the primary LME model (M1)

Groups	Name	Variance	Standard Deviation	Correlation
Subject ID	(Intercept)	0.045310	0.21286	
	<i>c-i-contrast</i>	0.027112	0.16466	-0.53
Stimulus ID	(intercept)	0.003703	0.06085	
	<i>c-i-contrast</i>	0.001337	0.03656	-0.42
Residual		0.100281	0.31667	

M1 was a significantly better fit than M0, $\chi^2(3) = 23.49, p < .0001$, indicating there were significant between group differences in effects for *c-i-contrast*. Overall, there was a stronger implicit association between gambling and sport, when the gambling logos were sport-relevant, rather than sport-irrelevant, $t = 4.3, p < .001$ (1 tailed). Also, there was a stronger implicit association between gambling and sport, when the sports were gambling-relevant, rather than gambling-irrelevant, $t = 2.39, p < .001$ (1 tailed). The full 3-way interaction, *c-i-contrast * gambling * sport*, was not significant, $t = -1.4, p = .162$ (2 tailed).

No significant differences in *c-i-contrast* effects were observed for gender, $t = 1.56, p = 0.119$ (2 tailed), nor were there significant gender x age group effect, $t = 0.07, p = 0.944$ (2 tailed). However, we did find a significant gender x ATGS *c-i-contrast* effect, $t = -2.18, p = 0.014$ (1 tailed). For females, more positive attitudes towards gambling was associated with a stronger *c-i-contrast* effect ($t = -2.01, p = 0.045$). For males, more positive attitudes towards gambling yielded a weaker *c-i-contrast* effect, although the slope was not significantly different from zero ($t = 1.26, p = .21$). Figure 8 shows the relationship between the magnitude of the *c-i-contrast* effect with respect to ATGS score for males and females.

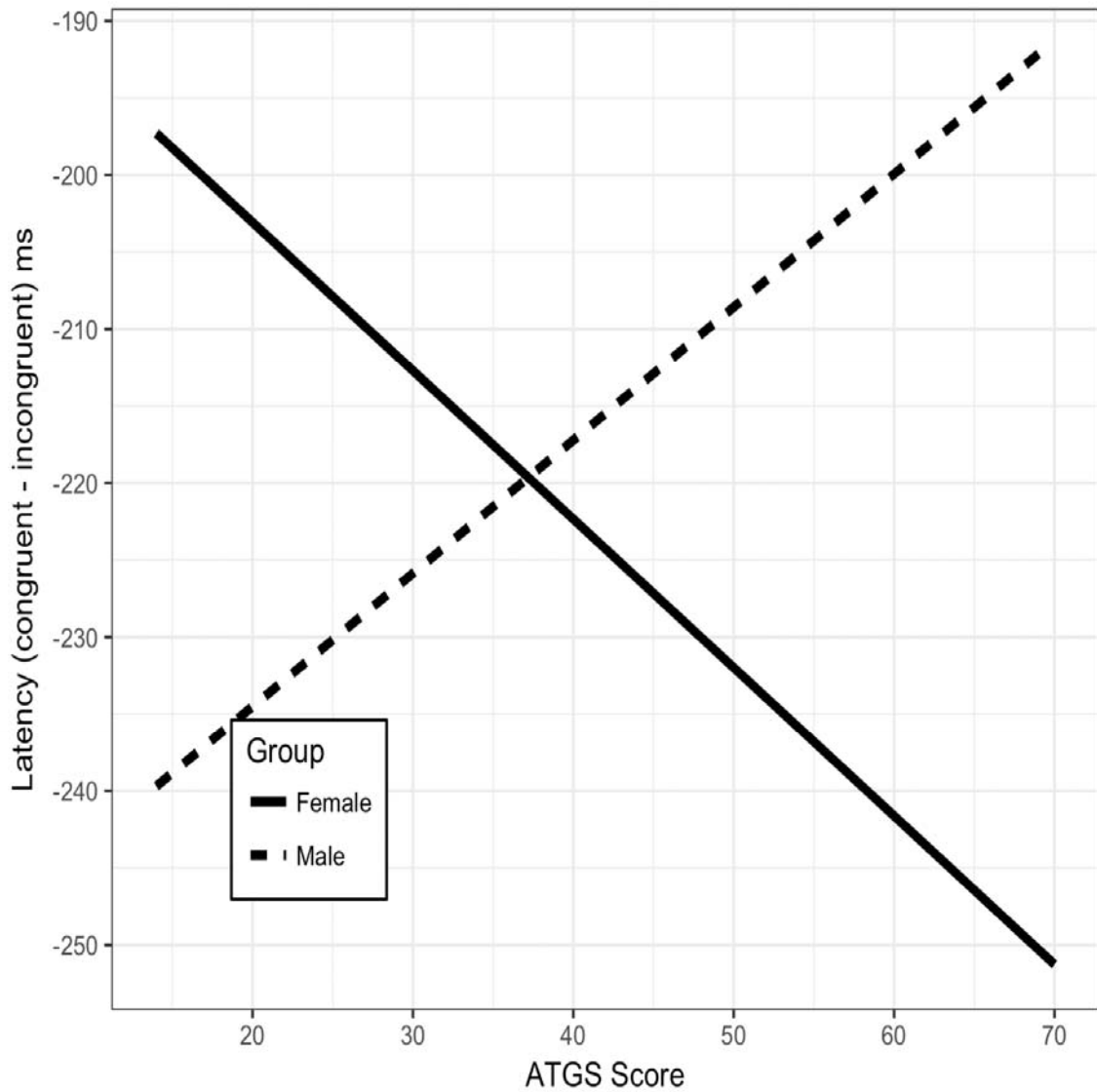


Figure 8 The *c-i-contrast* effects with respect to ATGS score for males and females

Figure 9 shows raw latencies with respect to age group and trial congruency. Younger participants responded more slowly overall, but the *c-i-contrast* effect was stronger for this group. That is, compared to participants from the 18 and above age group, they displayed larger latency differences between congruent and incongruent trials. This interaction effect was significant,

$$\chi^2(1) = 3.95, p = .0457.$$

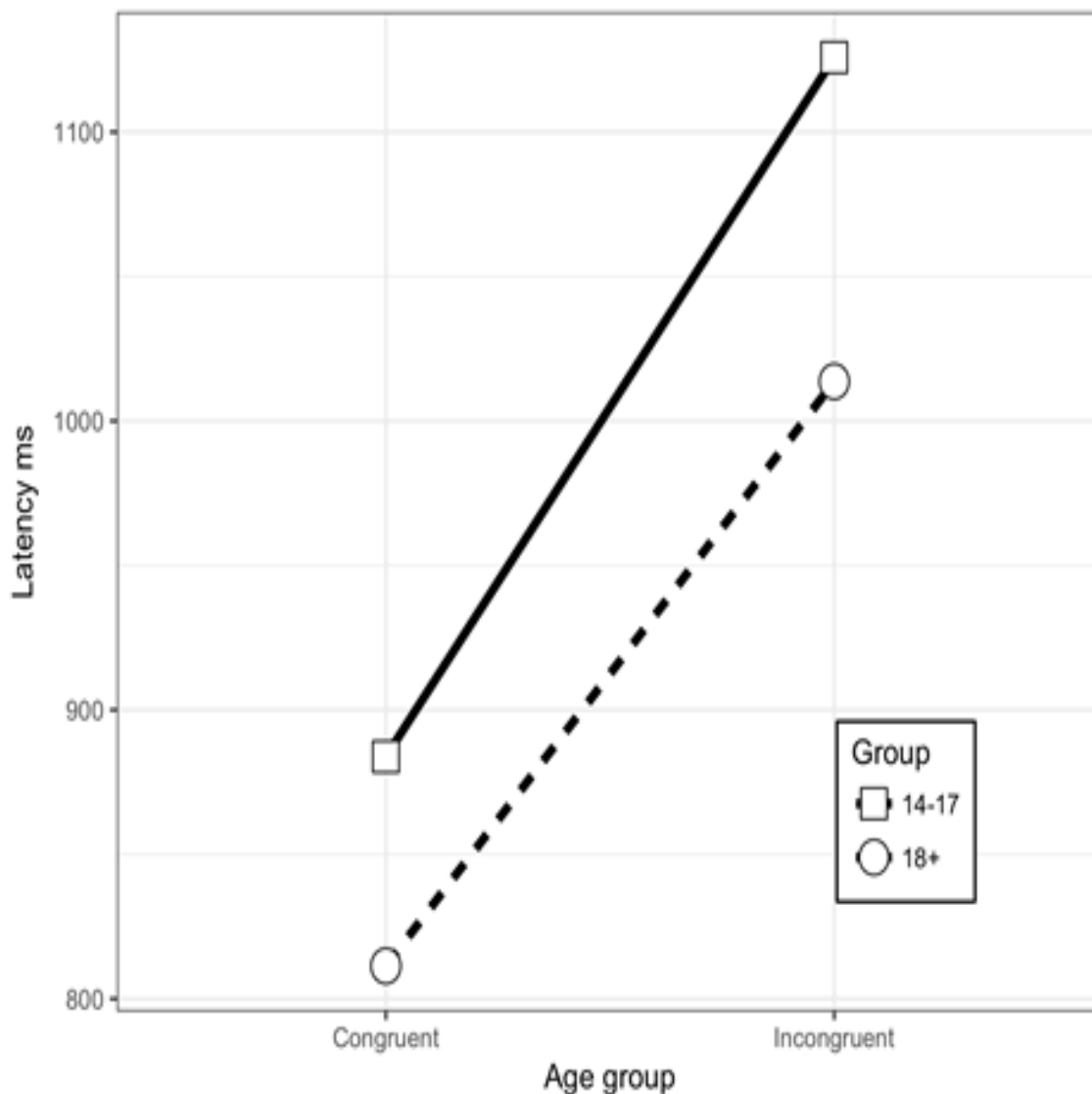


Figure 9. Raw latencies with respect to age group and trial congruency

No significant individual differences in implicit association were observed for time spent watching sports, $\chi^2(1) = 2.31, p = .1289$. Further, the 3-way interaction among age group x gender x sports-watching was not significant ($t = 0.27, p = .787$). We did not observe significant differences in *c-i-contrast* effects.

Finally, we extracted the per-individual random effects for the *c-i-contrast* effect, which may be taken to describe latent individual differences in association between sports and gambling. Since the *c-i-contrast* experimental effect is to reduce reaction time in the congruent trials, lower random effect scores correspond to lower than average latencies in the congruent trials for that subject, indicating a greater association for that individual. We then calculated Spearman correlations between the *c-i-contrast* random effect scores and scores on various measures. However, individual differences in the *c-i-contrast* effect were unrelated to the ATGS ($\rho = -0.03, p = 0.357$), intentions to gamble on sports ($\rho = 0.03, p = .395$), or amount of sports watched ($\rho = 0.038, p = .261$). Similar analysis was also conducted within each gender group and each age group. However, no group-specific *c-i-contrast* effects were found. In the 18 and above age group, those

with longer latencies overall had slightly lower ATGS scores ($R^2 = 0.02$). However, the *c-i-contrast* effect was unrelated to these between-subject differences.

Further analysis was performed on PGSI scores of those participants from the 18 and above age group. No PGSI-moderated differences in *c-i-contrast* effects were observed ($\rho = 0.029$, $p = 0.396$). Not surprisingly, men were more likely to have higher PGSI scores than women ($\rho = .38$, $p < 0.001$; mean PGSI = 3.97 for men, mean PGSI = 0.93 for women). The *c-i-contrast* random effect scores were also unrelated to the probability of individuals scoring +1 on the PGSI ($\rho = 0.01$, $p = 0.698$).

Conclusions

4.1 General discussion

The withdrawal of alcohol and tobacco advertising and sponsorship of sport created a vacuum in which gambling found a natural home. The products already had an accepted relationship, with betting becoming part of the broader social experience of watching sport or following a team particularly for young males (Gordon et al. 2015; Raymen & Smith Forthcoming). However, the saturation of advertising and sponsorship of sport by gambling companies created concerns often played out in the media, from the general public, public health officials, researchers, and eventually the government. The concerns expressed were regarding the potential impact on children and youth, particularly about the normalisation of gambling behaviours, encouraging underage gambling, and the influence on future legal gambling (COAG 2011). The normalisation of gambling behaviour has been identified as a community level, intergenerational harm (Langham, Thorne, Browne, Donaldson, Rose & Rockloff 2016), and previous research has identified that there is a link between advertising and the normalisation of gambling (McMullan et al. 2012).

The present project aimed to assess these influences of sport related gambling advertising and sponsorship on both adolescents and young adults, using an experimental methodology that measures the natural and potentially nonconscious level of association between concepts. Prior studies have mainly relied on methods of a more qualitative nature (McMullan et al. 2012; Thomas, Lewis, McLeod & Haycock 2012; Thomas, Pitt et al. 2016). In comparison, the IAT utilised in the present project can provide a robust measure of the association between gambling and sport. Moreover, this technique has the advantage in detecting conceptual links in people's minds that they might not be aware of, or might not want to admit due to social desirability (Brunel et al. 2004).

Overall the present project found that for the 14 to 24 year old demographic, gambling marketing has achieved a large market reach creating an implicit association between gambling and sport within the sample. This was demonstrated by three findings for both age groups: that there was a stronger implicit association between gambling and sport than their association with non-gambling/non-sport control concepts; that there was a stronger implicit association between gambling and sport when the gambling logos people encountered were sport-relevant; and that there was a stronger implicit association when the sports were gambling-relevant rather than gambling-irrelevant. For females, more positive attitudes towards gambling was linked with a stronger implicit association. This link, however, did not appear among males. The outcome of the present project also suggested the existence of a stronger implicit association in the below 18 age group, compared to the 18 and above age group. This last finding, nevertheless, needs to be treated with caution, since data for these two age groups were collected through two separate study links. Technically these two age groups should be considered as collected for two separate studies within the same project, and the differences between them could be due to factors other than age differences.

Advertising and sponsorship occur in a broader social environment that contributes to the normalisation of behaviours (Bellringer et al. 2003). The findings from the present project of an implicit association between gambling and sport suggest we may have passed a threshold in terms of normalisation of the behaviour within the youth and young adult population. Gambling logos were associated with sports more quickly than were major non-gambling brands, indicating a high level of familiarity with both the gambling brands and their products. This is consistent with previous research which found that youth identified with gambling experiences even before they

were able to legally gamble (McMullan et al. 2012) and that children and youth were vulnerable to gambling advertising (Friend & Ladd 2009; Korn et al. 2005; Messerlian & Derevensky 2006). A surprising finding within the present research is that there was no direct gender difference in the association of gambling and sport, despite the discovered gender difference in the link between this association and gambling attitudes. Previous research has found adolescent males saw gambling as more exciting (Derevensky et al. 2010), and more recent research has identified the promotion of gambling as a masculine leisure pursuit (Raymen & Smith Forthcoming). The lack of direct gender difference in the implicit association illustrates the pervasive effect of ICBEs such as sponsorship.

The effects of advertising and sponsorship of sport have been well established in relation to other products, particularly the effect of ICBEs (Richards 2017; Snyder et al. 2006; Stacy et al. 2004). Concerns have previously been raised that whilst children older than six years are able to distinguish program content from advertising (Ali et al. 2009), that the cues that support this are absent from ICBEs. Previous exploratory studies have found blurring between sports coverage and promotion for gambling even for teenagers due to the influence of in-game betting options and the use of sports identities and commentators in gambling promotion (Thomas 2014). This could explain the findings from the present project that the implicit association was stronger when the gambling logos were sport-relevant or the sports were gambling-relevant. Gambling sponsorship not only creates the implicit association but has also been found to generate positive attitudes towards the sponsor and higher gambling intentions in young adults (Hing et al. 2013). Even when young people are aware of the intent of gambling advertising, it still increases their desire to gamble (Messerlian & Derevensky 2006).

Overall the findings from the present project raise the question of whether current approaches of self-regulation and agreements between government and broadcasters are sufficient public health responses. To ensure harm minimisation in relation to gambling, governments may need to adopt a similar approach to alcohol and tobacco with regard to sport. The present regulations on advertising do little to address the pervasive influence of sponsorship, or ICBEs. Sponsorship forms part of the broader advertising mix and there is mutual benefit to both the advertiser and the sponsored team (Lamont et al. 2011). Given its influence on normalisation it should be considered and included in regulatory responses designed to minimise harm.

4.2 Limitations and future directions

The present project was not without limitations. The sample was a convenience sample recruited through online research panels. Hence, the findings may not be fully generalizable to the whole Australian youth population. Because participants in the below 18 age group had to have parental permission, it was possible that some of their survey responses (e.g., attitudes towards gambling and intentions to gamble) might have been influenced if their parents had remained present for the tasks. Another limitation of this project was the potential measurement errors associated with the IAT due to individual participants' computers being different. However, these potential errors should not pose as a critical threat to the validity of the major findings from this project, given the within-subject nature of the IAT. That is, potential hardware differences experienced by each participant should have similar impacts on her/his latency in both congruent and incongruent trials.

The influence of the implicit association on future gambling behaviour and any associated outcomes (harms) could only be truly determined through longitudinal research, which has been consistently highlighted as necessary to understanding long term influences on gambling behaviour (Barnes, Welte, Hoffman & Dintcheff 2005; Delfabbro, King & Griffiths 2014; Hayatbakhsh,

Clavarino, Williams, Bor & Najman 2013). However, given the strength of findings in the present project, it would be of value to extend this research to younger age groups to determine how early this association between gambling and sport is emerging. This is of particular importance given findings on the impact of advertising as young as two years old (Borzekowski & Robinson 2001) and the popularity of sport as a family leisure (Parliamentary Joint Select Committee on Gambling Reform 2013). Methodologically the present project only employed the IAT as an implicit measure and some self-reported explicit measures. More evidence should be gathered through other measurement approaches utilised in marketing or gambling research, such as eye tracking (e.g., Li, Breeze, Horsley & Briley 2014) or skin conductance measurement (e.g., Li, Rockloff, Browne & Donaldson 2016). Due to the sample limitation, a large majority of the participants in the present project came from the same cultural background. Future studies, however, should examine the implicit associations cross-culturally, due to the critical roles culture may play in shaping consumer behaviour (e.g., Briley, Danziger & Li Forthcoming; Briley, Wyer & Li 2014) and gambling participation (e.g., Raylu & Oei 2004). A further gap in the research is how the viewing environment can affect association and effect of the advertising on young people. Whilst broadcasters have argued that most children watch sport in the company of an adult (such as a parent) (Parliamentary Joint Select Committee on Gambling Reform 2013), there is no evidence that this provides any protection in terms of the potential impact of advertising and ICBEs and previous findings in relation to alcohol suggest it is worth further examination (Stacy et al. 2004).

4.3 Recommendations

We recommend the following strategies to support the development and implementation of evidence based policies:

1. The regulation of gambling advertising in sport should include sponsorship and other forms of ICBEs.

The findings from the present project demonstrate that gambling and sports are already implicitly associated by adolescents and young adults. This association is stronger for those sports where gambling sponsorship is prevalent. This association exists in the 14-17 year age group despite the restrictions on direct advertising and gambling commentary introduced some years ago. This suggests that ICBEs such as sponsorship are having a strong and pervasive impact on youth, contributing to the normalisation of gambling and increasing the risk of them developing problems with gambling. Changes to regulations should consider the exposure children have to ICBEs and include strategies to reduce this exposure.

2. Evidence based education strategies should be developed to support increased resilience to the marketing normalisation of gambling with sport.

Education of both parents and children is essential to develop resilience to the nonconscious effect of marketing gambling with sport. These strategies should equip parents to have informed discussions with children about gambling, including non-harmful consumption, and increase their awareness of behavioural modelling in relation to gambling. These approaches are consistent with public health efforts in relation to smoking and tobacco. Education for children about gambling, including an understanding of likelihood of winning, marketing strategies, social norms and non-harmful levels of consumption can be supported through multiple modalities. This might include the expansion of current life education programs that deliver similar services around alcohol, illicit substance, diet and other lifestyle behaviours; and the development of online resources that support education being delivered both in the home and at school.

3. Improved evidence is needed on the short and long term impacts of gambling advertising and ICBEs on both youth and adults.

Robust evidence is needed both to inform the development and implementation of policy and regulatory responses, and to evaluate their effectiveness. The findings from the present project, whilst limited as a cross sectional and non-representative sample, offer robust support for previous self-reported findings. However, including assessments of the level of association between gambling and sport in extant longitudinal studies of children and youth health would be of significant benefit to the evidence base. Furthermore, the level of association for more matured adults is yet to be empirically determined. Examining this association between gambling and sport in adults from different age groups, particularly among vulnerable populations, is necessary to support the development of comprehensive regulatory frameworks. The ongoing use of methods such as implicit association testing, that avoid inherent biases of self-report, is strongly recommended to ensure a rigorous and defensible evidence base for policy and regulation.

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