


# An Exploration of How Simulated Gambling Games May Promote Gambling with Money

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**Abstract** Portable media devices, such as smartphones, have allowed gambling related content to infiltrate into a new market of potential consumers. Simulated gambling products are now readily available through multiple online platforms, and are becoming a popular form of entertainment for many young media users. Despite widespread use of these products, very little is known about how continued exposure to and involvement with simulated gambling may impact on real-money gambling attitudes and behaviours, particularly for young consumers. This paper reviews the literature exploring simulated gambling products and how consumption may promote monetary gambling, as well as fostering pro-gambling attitudes among youth and adolescents. Findings suggest that youth are highly exposed to simulated gambling games, and those who engage with these products are also more likely to be prone to monetary gambling and gambling problems. Virtual currency, in-game events and gambling themed content are also likely to promote biases about gambling or desensitise consumers to monetary losses. Simulated gambling products may therefore pose a risk to consumers, and particularly young consumers, rather than serve as a benign substitute for monetary gambling. To date, research has largely focused on correlational relationships between simulated and monetary gambling using

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cross-sectional methodologies. Future research should focus on determining the causal pathway between simulated gambling involvement and monetary gambling in order to identify and manage any risk associated simulated gambling participation.

**Keywords** Simulated gambling · Social casino games · Gambling · Youth · Adolescents

## Introduction

Trends in media use have led to a change in the way many forms of gambling are delivered and experienced; providing new and potentially more accessible and engaging gambling environments (Dussault et al. 2017; Gainsbury et al. 2014b). Portable media devices, such as tablets and smartphones, and the widespread availability of wireless internet networks, means that online, internet or remote gambling is becoming both more popular and more difficult to regulate (Gainsbury et al. 2012, 2014a; Griffiths 2003). The new internet media is multi-faceted and interconnected; providing the ability to make calls from the television, play games on your mobile phone, and watch television from your computer (de Freitas and Griffiths 2008). These technologies are resulting in profound changes in the way people consume all forms of media and electronic entertainment, including gambling and emerging gambling products.

Reflecting the increasing popularity of portable media devices and social media applications, there has been a substantial rise in the number of gambling products (including monetary and simulated forms) available to consumers via varying platforms; increasing gambling accessibility and exposure to consumers (Gainsbury et al. 2014a). Because mobile devices are inherently easy to access, consumers can select a broad range of digitalised games, anytime and anywhere (Derevensky and Gainsbury 2016). These games can often be downloaded for free and accessed without limitation through wireless internet feeds. The increasing popularity of games and mobile applications means that manufacturers of gambling products have a new environment in which to market gambling content to young consumers. As well as an increase in the use and availability of online real-money gambling products, media and technology can now offer simulated *gambling games* that replicate or mimic gambling activities, but do not involve monetary risk or monetary rewards (Gainsbury et al. 2014a). Because simulated gambling games appear so similar to monetary gambling, they tend to blur the boundary between gambling and gaming (Derevensky and Gainsbury 2016; Griffiths 2003).

The fast-evolving digital environment makes it challenging for researchers to identify, define and study the use of simulated gambling products. Given that informal internet-based currencies or tokens may be used; with real or perceived value, this raises questions of whether simulated games might be considered “gambling” according to a traditional definition (King et al. 2010). Many games might have free-play time or special unlocked features as a reward, and these rewards have a tangible value to players that they might otherwise be willing to purchase. Moreover, very little is known about the impact of engaging with simulated gambling games on real-gambling behaviours and attitudes.

According to the Australian Communications and Media Authority (2016), 82% of 14–17 year olds surveyed in June 2015 (n = 508) reported to accessing the internet in the proceeding 4 weeks. In 2011, less than a quarter of teens had used a smart phone (N = 374) compared to 80% in 2015. Further, internet usage for 14–24 year olds was greater than older age groups. The intense use of digital entertainment by children and youth entails that they have correspondingly higher exposure to gambling games, which

may act to increase their vulnerability to problems associated with both monetary and simulated gambling. The current paper will review and discuss the literature surrounding simulated gambling products with a specific focus on potential impacts to adolescents and youth.

## An Introduction to Online Gambling Games

Mobile application stores and social media platforms commonly offer games that involve a simulation of a real-world experience. Simulated gambling games are readily available in mobile app stores and also embedded within other mobile games as “mini-games.” Simulated gambling games refer to products that include similar features and often resemble the seductive nature of real-gambling, but do not require any monetary investment (Griffiths 2003). This makes it increasingly difficult for consumers to distinguish between what is considered gambling, simulated gambling or simply just gaming (Abarbanel et al. 2017; Albarran Torres and Goggin 2014; King et al. 2016). Applications within an application, social networking sites, installable applications, gambling mini-games or practice sites are just some of the many products incorporating gambling themes available to consumers (Floros et al. 2013).

Gainsbury et al. (2014a) developed a taxonomy for understanding the different online gambling products available and proposed that games could be categorised based on their structural characteristics: the monetary requirements; the platform via which it is delivered; and the centrality of a gambling theme to game play. For a game to be considered gambling it must involve monetary investment towards a game-related outcome and provide a dividend or reward (either fixed or partially predetermined) based on an element of chance (Gainsbury et al. 2014a). If a monetary investment is an optional feature of the game and game play can continue without making a payment, or the outcome is not at least partially determined by chance with a pre-determined reward, the game is not considered gambling (Gainsbury et al. 2014a; Parke et al. 2012). Simulated gambling games can be organised into four forms: (1) social casino games; (2) social games or virtual worlds with casino features; (3) practice games; and (4) standalone console, online, or mobile games (Gainsbury et al. 2014a).

The first two forms of simulated gambling games are integrated or reliant on social media platforms such as Facebook or Twitter (Gainsbury et al. 2014a). These sites offer a number of games that can be played either collaboratively or in isolation, and can incorporate gambling type features. Games integrated into social media are differentiated as either social casino games or virtual world with casino features based on the extent that the gambling theme is central to game play (Gainsbury et al. 2014a). For example, social casino games come in many forms (i.e., slots, bingo, blackjack, roulette etc.), can be downloaded through social media sites, and use virtual money (King et al. 2010). These games allow for people to play socially, and against real people using their social media profiles. Conversely, social game or virtual world with casino feature games are those where gambling is not the primary focus of the game, but the game includes gambling themes or features such as virtual currency to wager on things like spinning wheels, symbols, or virtual contests (Gainsbury et al. 2014a). These features tend to be included to allow for players to receive greater rewards more quickly or accelerate their progress in the main game (King et al. 2010).

Practice games and stand-alone console, online or mobile games refer to gambling style games that are not integrated with social media platforms, and are distinguished based on the provider of the game (Gainsbury et al. 2014a). Practice or demo games refer to those provided by gambling operators who also manufacture real gambling products; whereas those that are supplied by providers independent from gambling industry are referred to as stand-alone, online or mobile games (Gainsbury et al. 2014a). These games are generally simulations of traditional games (i.e., blackjack, slots, poker etc.), can be downloaded to a media device, and involve virtual currency (King et al. 2010). Practice or demo games are generally offered by online casinos so users can try the product before investing real money (Gainsbury et al. 2014a; King et al. 2010), whereas standalone games are not associated with real gambling sites and products (Gainsbury et al. 2014a).

### **Simulated Gambling and the Association with Monetary Gambling: What is Known?**

Many simulated gambling games are advertised or promoted as fun, youth friendly forms of entertainment (Griffiths and Parke 2010); causing concern amongst numerous gambling researchers as to how the use of—and exposure to—simulated gambling games may impact on the gambling behaviours of youth and adolescents (Derevensky and Gupta 2007; Griffiths 2003; Ipsos MORI 2009; King et al. 2010, 2014; Messerlian et al. 2004; Williams and Wood 2007). Before we can consider the impact of these products on gambling, it is important to explore how these products are being used in conjunction with real gambling products. For the remainder of this paper, simulated gambling hereafter is defined according to King et al. (2014, p. 305) as:

...a digitally simulated interactive gambling activity that does not directly involve monetary gain but is structurally identical to the standard format of a gambling activity due to its wagering features and chance-determined outcomes of play.

Very few studies have investigated the prevalence of simulated gambling game-play in the adult population. One study conducted by McBride and Derevensky (2009) sampled 563 participants between the ages of 18 and 65 years on their internet gambling behaviours. Participants were recruited via online advertisements posted on casinocity.com; providing an internationally diverse sample of online gamblers and gamers. While less than half of those sampled in the study gambled online (42.3%), over 77% reported playing online non-monetary gambling type games; suggesting that adults who gamble on simulated games are not necessarily internet gamblers. The majority of those who played simulated gambling games tended to play on multiple sites (two to five; 58%), with the remaining 41.4% reporting play on only the one site. Most of those who used these products played for less than 1 h each session (43.5%), however, 33.3% reported playing between 1 and 2 h per session, while nearly a quarter (22.8%) played over 4 h per session. In their study of adult social casino gamblers, Gainsbury et al. (2016) showed that those who subjectively equated monetary gambling to simulated gambling had a greater frequency of simulated gambling game play. Greater frequency of simulated gambling may therefore pose a risk factor for developing monetary gambling habits. Those who do not transition to monetary forms of gambling, while not experiencing the financial burdens of gambling, may similarly experience problems with dependence, lost time, dissociation and other non-financial harms.

Research suggests that a substantial portion of adolescents and youth play simulated gambling games (Derevensky and Gupta 2007; Griffiths and Wood 2007; Hardoon et al. 2002; Ipsos MORI 2009; King et al. 2014; McBride and Derevensky 2009). For instance, King et al. (2014) explored digitalised gambling activities amongst a sample of 1287 high school students (ages 12–17 years) and found that 31% had engaged with non-monetary gambling at least once, and a further 13% reported to using simulated gambling products within the 12 months prior to the study. Twenty-five percent of participants reported to having played a gambling themed game within a videogame; while far less reported to having played standalone gambling simulation apps (6.3%) and demo or practice modes (4.7%). Similar prevalence rates have been found in a large-scale British population survey exploring the gambling behaviours of 8958 youth between the ages of 12–15 years (Ipsos MORI 2009). Over a quarter of participants (28%) reported to having played simulated gambling games in the seven days prior to the study. Prevalence rates of simulated gambling usage among youth suggest that a significant minority of children are attracted to gambling games (Ipsos MORI 2009).

Despite relatively high participation rates in simulated games, youth prefer to gamble with real money than on games that offer points or simulated credits (Forrest et al. 2015). Unlike adult populations, it appears as though simulated and monetary gambling co-occur in adolescent populations. That is, those who do gamble online for real money are more likely to also play simulated gambling games. Results from the British prevalence survey mentioned earlier showed that youth participation in free-play gambling products in the seven days prior to the study was the single most prominent predictor of whether they had gambled with real money in the same seven day period (Ipsos MORI 2009). Griffiths and Wood (2007) found that 29% of adolescents who gambled online would also report playing free demo games, while King et al. (2014) showed that the number of simulated gambling activities respondents reported playing in the past 12 months was the strongest predictor of monetary gambling. More recent research by King and Delfabbro (2016a) showed that youth who engaged in financial forms of gambling also engaged in simulated gambling, but those who engaged in simulated games did not necessarily gamble for money. Males were also more likely than females to report both simulated gambling and financial gambling. These findings have been supported by Gainsbury et al. (2016) who found that gambling as a result of simulated game play was more likely among younger males. These findings suggest that simulated gambling may be more concerning amongst those vulnerable to gambling problems given that the younger, male demographic appears to engage in both simulated and monetary gambling (Gainsbury et al. 2016, 2017; King and Delfabbro 2016a).

While not everyone who plays simulated gambling games also gambles for money, these simulated gambling games have the potential to serve as a gateway to monetary gambling (Hardoon et al. 2002). A number of cross sectional studies have reported simulated gambling to be a predecessor to monetary gambling (Gainsbury et al. 2016; Griffiths and Barnes 2008; King et al. 2016). For instance, in a study by Griffiths and Barnes (2008), 21% of internet gamblers ( $N = 473$ ) reported demo or practice games to be the primary reason for gambling online. Similarly, King et al. (2016) found that two thirds of adolescent social casino game players ( $N = 130$ ) claimed that social casino games preceded monetary gambling. In a study by Gainsbury et al. (2016), of the 521 adult gamblers who had engaged in social casino games in the 12 months prior to completing a survey, 71.2% reported that playing social casino games did not impact on their real gambling behaviours. However, 9.6% reported an increase in gambling in the past 12 months, while 19.4% suggested that simulated gambling had directly contributed to gambling for money.

Few studies have explored the longitudinal relationship between simulated gambling and the initiation of monetary gambling (Dussault et al. 2017; Kim et al. 2015). Kim et al. (2015) explored the transition from social casino gaming to online gambling in a sample of 409 social casino gamblers (ages 18–69 years) who had never gambled online for money prior to the study. At a 6 month follow up, approximately 26% of social casino gamers had transitioned to monetary online gambling. Dussault et al. (2017) used a similar methodology to explore the transition from simulated to monetary gambling in a sample of 1220 adolescents (ages 14–18 years old) over a 1 year period. Participants were included on the basis they had never gambled for money prior to the time of recruitment. Results suggested that playing a simulated gambling game was associated with the initiation of monetary gambling. Of those who participated in a simulated version of a gambling game, 28.8% had gambled with real money during the 1 year period. However, this relationship existed only for those who transitioned from simulated poker to playing poker for real money. Authors suggested that free-play poker sites may be used in order to refine skills and learn game strategies prior to playing for money, and may therefore appeal to those with a pre-existing interest in monetary gambling.

Simulated gambling games are likely to increase risk-taking behaviour when playing with real money. Bednarz et al. (2013) sampled 80 participants and explored the extent to which prior experience on a free-play mode affected real gambling on a computer based roulette game. Participants were divided into one of four exposure conditions that determined whether or not they played the simulated gambling product and the outcome of the session. Conditions included a no exposure condition (control group), a loss condition, a break-even and a profit condition (return to player was greater than 100%). They expected that those who played the free-play game would show greater risk-taking when playing for real money compared to the no free-play control group. Their results showed that pre-exposure to free-play products had a significant effect on the total number of credits wagered, and the average number of credits wagered per spin when playing for real money. Those who did not play the free-play game placed smaller bets than any of the free-play conditions, and overall had significantly lower average expenditures than both the break-even and winning free-play groups. This suggests that those who use simulated gambling products may be more likely to spend more when gambling with real-money.

While there are yet to be any longitudinal studies exploring the developmental associations between simulated gambling and gambling problems, cross sectional research suggests an association between simulated gambling and gambling problems (Gainsbury et al. 2016; Hardoon et al. 2002; King and Delfabbro 2016a; King et al. 2014). For instance, in an adult sample of social casino gamers, Gainsbury et al. (2016) found that those who reported gambling for money as a direct result of simulated game play were more likely to have higher levels of problem gambling severity. Hardoon et al. (2002) investigated the association between gambling behaviours and simulated game play of 2336 youth between the ages of 12 and 19 years. Results showed that gambling online without money was very popular amongst youth, particularly for probable pathological gamblers (25%) and at-risk gamblers (20.4%). Similarly, a study by King et al. (2014) showed that students who endorsed items on a measure of pathological gambling were three or more times more likely to use simulated gambling products. Those categorised as at-risk pathological gamblers had significantly higher prevalence rates for simulated gambling than non-pathological gamblers. Further, despite low numbers of participation for gambling via standalone products (or mobile apps; 6.3%), this form of gambling was over 6 times more prevalent among at risk gamblers compared to non-problem gamblers. This suggests that while the majority of those who use simulated products do so

inadvertently through other video games, those experiencing problems are more likely to engage in standalone gambling products that simulate real gambling.

The association between simulated gambling participation and problems was further supported in the British population study of youth (Ipsos MORI 2009). Among those who had gambled, participation in free-play modes was the strongest predictor of problem gambling. This study identified similarities between the use of simulated products and participation in other gambling forms as identified with internet gamblers. There was a clear relationship found between simulated gambling and gambling for money. However, the proportion of expenditure on online gambling was found to be relatively low (1%) compared to other forms, suggesting that those who were attracted to these products tended to gamble offline. That is, youth who gambled on free-play or simulated gambling products were more likely to engage in traditional or land-based gambling activities rather than internet gambling products.

More recently, King and Delfabbro (2016a) compared problem gambling symptoms of youth who played gambling simulations and those that played gambling simulations as well as gambled for money. Results showed that both groups reported to experiencing a preoccupation with gambling, while those who gambled for money as well as on simulated gambling games also experienced gambling-related conflicts with family, friends or school. These findings suggest that an interest in gambling, or simulated gambling in isolation, may not necessarily cause harm unless people are also engaging in monetary forms of gambling.

## Simulated Gambling: Issues and Implications

Given the increasing prevalence and broad nature of simulated gambling products, and their associations with monetary gambling, it is important to determine how and under what circumstances simulated gambling involvement may result in a transition to monetary gambling. Examination of this transition is particularly important when considering young consumers who are more likely to be at risk with the emergence of new, online gambling products (Gainsbury et al. 2014a; Griffiths 1999; Griffiths and Parke 2010; King et al. 2010, 2014). Many authors have provided insights into why adolescents or youth may be more vulnerable to gambling through technological means (de Freitas and Griffiths 2008; Derevensky and Gupta 2007; Griffiths 2003, 2005; Griffiths and Parke 2010; King et al. 2010). They suggest that simulated gambling involvement increases exposure to gambling, and allows for practice and experimentation; but also promotes misperceptions about skill and the probability of winning.

## Practice and Experimentation with Gambling

Simulated gambling games offer consumers the opportunity to gamble without the risk of losing money. Demo or practice games featured on product websites allow people to familiarise themselves with how a game operates and explore in-game features without the negative financial consequences associated with losing (Derevensky and Gainsbury 2016; Frahn et al. 2015; Griffiths 2003). This means that novice bettors, that may be nervous or unwilling to invest money to experiment with gambling products, have the ability to “try before they buy” (Gainsbury et al. 2012), allowing those who would otherwise avoid gambling for fear of losing money to explore how a game operates and practice before gambling on the real thing.

Increased familiarity with a game through experimentation and practice is likely to promote overconfidence in one's ability to play and generate the illusion that gambling "is just a game" when engaging with monetary forms (Bednarz et al. 2013; Griffiths 2003; King et al. 2010). In studying the relationship between simulated and monetary gambling, Bednarz et al. (2013) showed that practice modes promoted false perceptions around skill, and generated increased confidence in one's gambling ability. Over half of participants who used free-play modes (68.3%) reported feeling more confident when playing roulette for real-money, and a further 48.3% believed that the practice modes enhanced their ability to play the game. Simulated games are therefore likely to contribute to greater risk taking when gambling with real money due to an overconfidence generated from the perception that practice can impact on gambling outcomes and the ability to play the game.

This opportunity to practice and experiment is particularly relevant for younger people, for whom it is otherwise illegal to engage in gambling. For adolescents, real gambling may have appeal as 'adult' activities. This may add to the attraction of simulated games, since they provide a means to participate in an otherwise forbidden activity. Currently, there are no age restrictions on access to free-play or simulated gambling games. Not only can underage gamblers access these practice sites, they are also exposed to simulated gambling through other online channels such as social networking sites, mobile phone applications or within video games that have relatively lax age verification measures (Abarbanel et al. 2017). In their survey of online gambling sites, Smeaton and Griffiths (2004) found that majority of sites did have practice or demo sites available to adolescents, and that minimal restrictions were in place to prevent underage gamblers from switching to the monetary version of the game. Simulated games might therefore serve to groom youth into developing gambling habits that are then transferred across to real gambling following this initial experimentation.

Despite gambling being illegal in many jurisdictions for those under 18 years of age, and some efforts made to restrict underage access to internet gambling products, many youth can and do engage in both monetary and simulated gambling online (Griffiths 2003; King et al. 2014). Few gambling sites appear to be effective in restricting access or implementing effective age verification (Griffiths 2003; King et al. 2010; Poulin 2000; Smeaton and Griffiths 2004) and fail to protect some of the most vulnerable consumers (underage gamblers) from illegally accessing online gambling services. The ability to access simulated gambling games does not necessarily mean that people will transition to monetary forms of gambling. It is likely, however, that the deregulation of simulated games designed to promote monetary gambling, and inadequate age verification measures may encourage monetary gambling among youth and adolescents.

### **Increased Exposure to Gambling Themes and Advertising**

Mobile games and the increased popularity of online media mean that people are likely to be exposed to gambling themes and content despite not necessarily looking for it. This can occur three ways: through inadvertent gambling exposure, social facilitation of gambling exposure, and advertising.

#### *Inadvertent Gambling Exposure*

Inadvertent gambling exposure occurs when consumers are exposed to gambling related themes within other social games. In such cases, those who may not necessarily be interested in gambling are exposed to, and often pressured to engage with, gambling



related activities as part of their regular game play experiences (Floros et al. 2013). According to the taxonomy of simulated gambling, this type of inadvertent exposure within another game is considered “virtual world with casino features” as the gambling theme is not central to game play (Gainsbury et al. 2014a). Inadvertent exposure to gambling content has yet to be thoroughly examined in the literature. However, Floros et al. (2013) suggests that gambling features are often included as a way to receive rewards or unlock features to allow the player to progress to higher levels in the game (Floros et al. 2013). Therefore, the ability to continue game play or reach a goal is often dependent on engaging with the gambling feature.

### *Social Facilitation of Gambling Exposure*

Social facilitation of gambling exposure is most relevant for social casino games where consumers play the gambling themed game (such as slots, blackjack or roulette) via their social media account. These types of games encourage players to share the gaming experience with their social network, as well as invite others to play in order to receive in-game incentives and rewards (Abarbanel et al. 2017). Sharing in-game experiences means that the game is then broadcast to everyone in the player’s social network, often seeking social recognition for in-game successes and tempting others to do the same in order to receive similar recognition from their peers (King et al. 2010). Many of these games include an active recruitment tool that encourages players to invite a friend in order to receive in-game rewards (Abarbanel et al. 2017). These features are similar to those found on real poker sites, where programs encourage people to invite friends in order to receive free credits or similar incentives (McMullan and Kervin 2012). Not only do these features expose a potential by-stander to gambling related content, but pressure to conform may promote active engagement by someone who may not have otherwise been exposed or interested in gambling, either simulated or real (King et al. 2010; Ladd and Petry 2002).

### *Advertising*

Many social casino game companies that promote simulated games via social media are now owned by gambling operators, but are not subject to the same regulations as gambling advertisements (Abarbanel et al. 2017; Derevensky and Gainsbury 2016). Advertisements can often interrupt game play or app usage (regardless of whether it is a gambling-themed game), offer links or videos to the social casino game, take over the entire screen with specified-minimum viewing times and offer incentives for new players (Abarbanel et al. 2017). Similarly, demo or practice games offered by operators tend to be modelled off the real product. Consequently, operators often use free versions of games as a way to advertise and promote their real gambling product to new users (Derevensky and Gainsbury 2016; Frahn et al. 2015). For gamblers, particularly those experiencing problems, advertising is related to an increase in internet gambling (Derevensky et al. 2010). Those with higher internet usage or who play simulated versions are more likely to be exposed to advertising, pop-ups, emails and other advertising material encouraging them to engage with gambling related content or play the real thing (Abarbanel et al. 2017; Frahn et al. 2015; King et al. 2010; Sévigny et al. 2005).

A study by Abarbanel et al. (2017) explored the types of gambling advertisements captured by young adults (aged 25 and under) who used social media daily over a 1 week period. The majority of the advertisements were for social casino games, and were generally presented via the social media platform Facebook. The authors suggested that the

advertisements were designed to appeal to younger demographics and were considered to glamorise gambling and the experience of winning. The advertisements were said to normalise gambling; encouraging people to play and play “for free”. Other authors suggest that advertisements offered via simulated gambling games are likely to increase exposure to gambling related content and encourage people to play the real thing (King et al. 2010), while creating and perpetuating erroneous beliefs or cognitive distortions about gambling (Derevensky and Gainsbury 2016; Derevensky et al. 2010; Frahn et al. 2015; King et al. 2010; Sévigny et al. 2005). Many of the messages included in pop-up features promoting real gambling tend to misrepresent chance and indicate that winning or receiving a prize is the most likely outcome from gambling for money online (King et al. 2010), drawing comparisons with wins experienced in free play versions (McBride and Derevensky 2009).

Sévigny et al. (2005) surveyed demo gambling products to explore the types of messages received by consumers of free-play, practice games. Simulated game play resulted in numerous messages via emails or pop-up messages that tended to focus on the winning outcomes associated with the demo product and encouraged people to play with real money. The majority of messages included fictitious information about gambling that suggested skill and practice would increase the likelihood of winning. Slogans such as “practice really does make perfect” or “you are one of our smartest fun players” not only encourage betting persistence, but provide people with greater confidence and promotes an illusion of control over gambling outcomes that may tempt consumers to apply their newly developed skills to real gambling. The promotion of erroneous gambling beliefs in advertising and promotions on simulated gambling games is concerning given the relationship between cognitive distortions about gambling and gambling problems (Barrault and Varescon 2013; Blaszczynski and Nower 2002; Myrseth et al. 2010). Those who are vulnerable to developing biases or distortions about gambling may be more likely to show greater gambling persistence and take more risks when gambling with real-money.

In their study of youth exposure to gambling advertisements, Derevensky et al. (2010) found that most advertisements contained messages that fostered distorted views of gambling such as winning is easy, the chance of winning is high and that gambling is an easy way to get rich. However, other research has shown that the extent of exposure naturally varies depending on one’s level of gambling participation. For instance, in the British population study (Ipsos MORI 2009), those who participated in monetary and simulated gambling were more likely to remember seeing gambling advertisements. It is also likely that online media usage may determine the extent to which one is exposed to gambling material. Youth are significant consumers of digital and online media. The British population survey of youth between the ages of 12–15 years showed that 96% of the sample had used the internet in the seven days prior to the study and over a quarter of the sample reported to have spent at least 8 h online (28%), while one in ten adolescents would report more than 15 h (11%) of internet activity a week (Ipsos MORI 2009). Greater familiarity and consumption of digital web based technologies means that youth are also more likely to be exposed to gambling related content (King et al. 2010). Despite some youth not participating in monetary or simulated gambling, given that most engage with the internet regularly and for extended periods of time, they would naturally be exposed to gambling content and advertising (Abarbanel et al. 2017; McMullan and Kervin 2012; Monaghan et al. 2008; Phillips and Blaszczynski 2010; Sévigny et al. 2005) that normalises gambling as fun, everyday activity (Derevensky and Gainsbury 2016; McMullan and Kervin 2012).

Greater exposure to gambling related content may facilitate more positive attitudes towards gambling. This is particularly concerning for youth as the sharing and inviting of

social casino game play is likely to generate the idea that gambling is socially acceptable (King et al. 2010; Ladd and Petry 2002), but the familiarity with web based processes may also generate ease when contemplating exchanging money on web-based servers compared to older generations who may be more cautious (Griffiths 2003). Further, some suggest that their competence with using digitalised media and web-based products may be transferred into a gambling space (King et al. 2014). Results from the British prevalence study exploring youth gambling suggest that those who spend more than 8 h a week online are more likely to spend money on gambling games and participate in free-play gambling products. Therefore, higher rates of internet use as seen in younger populations may be contributing to their participation in gambling activities (Ipsos MORI 2009).

While youth are more likely to be exposed to gambling related content through natural use of the internet and social media (Abarbanel et al. 2017; de Freitas and Griffiths 2008), engagement with these technologies is happening at a much earlier age (Griffiths 2003; King et al. 2010; Ladd and Petry 2002). However, there have been no studies conducted that explore how early exposure to simulated gambling games may impact on gambling problems over time (King and Delfabbro 2016b). Research shows that those who begin gambling at an earlier age are more likely to be problem gamblers (Delfabbro et al. 2014; Derevensky and Gupta 2007; Griffiths and Parke 2002; Gupta and Derevensky 1997; Volberg et al. 2010). Adolescents who have been found to display pathological gambling behaviours report having started gambling as early as 9 or 10 years of age (Derevensky and Gupta 2007; Griffiths and Parke 2002; Gupta and Derevensky 1997). Simulated gambling products may therefore serve to reinforce gambling behaviour from a much younger age given the increased access to gambling content, leading to greater gambling consumption and problems later on (King et al. 2014).

### Misrepresents Real Gambling Experiences

As with promotions or advertising that accompany simulated gambling products, the simulated game itself can also promote false perceptions or expectations surrounding the chances of winning and the involvement of skill in gambling (Gainsbury et al. 2014a; King et al. 2010; Monaghan 2009). For instance, social virtual-world games that include gambling themed content as a side feature often market gambling as fun, lucrative and exciting, and often misrepresent the level of skill required (King et al. 2010; Monaghan 2009). Another issue with social casino games is that many of the outcomes are not based on predetermined odds or even by chance, but can be tailored to the individual users' playing behaviour (Gainsbury et al. 2014a). Unlike real gambling products, there is no regulation regarding return to player rates and therefore, many of these games, particularly practice or demo gambling products, do not provide an accurate picture of the return to player rates experienced in real gambling products (Frahn et al. 2015; King et al. 2010; Sévigny et al. 2005).

Return to player rates are calculated by the amount of money won divided by the amount of money wagered and multiplied by 100 (Frahn et al. 2015; Sévigny et al. 2005). In order for the gambling vendor to receive a profit, the return to player rate would need to be below 100%. Australian slot machines typically have a return to player rate of 85–90% (Frahn et al. 2015). Internet gambling's return to player rates are often higher than traditional forms due to minimal overhead expenditures by operators and greater competition for patronage (Williams and Wood 2007). Simulated gambling games' return to player rates tend to be even higher given the absence of money and there being no need to conserve profits by the manufacturer. When players transition from demo or practice

modes to the real product to gamble for money, this payout rate decreases significantly (King et al. 2010; Sévigny et al. 2005).

Sévigny et al. (2005) investigated the payout rates of 117 online roulette sites and found that 39% provided users with inflated payout rates. They then randomly selected 5 sites who had inflated payout rates over 100% for both 100 and 500 trials to determine whether these rates were maintained when gambling for real money. Their results showed that 4 of the 5 sites presented payout rates under 100% in real gambling sessions. These inflated payouts on simulated games may represent a strategy whereby vendors try to reinforce real-money gambling by providing a lucrative experience on simulated versions (Sévigny et al. 2005). Inflated payout rates in demo modes create an illusion not only that the game is more profitable than it is, but also that gamblers have a better chance of winning online (Sévigny et al. 2005; Wood et al. 2007). This misconception is then used when marketing the real-version as promotions and advertising focus on the winning outcomes experienced within the demo mode to try to entice players to engage with the real version to gamble with real money (McBride and Derevensky 2009; Sévigny et al. 2005).

Research suggests that outcomes experienced during simulated or free-play gambling can influence monetary gambling behaviour (Bednarz et al. 2013; Frahn et al. 2015). In their study of free-play gambling and monetary gambling, Bednarz et al. (2013) showed that participants in the losing free-play condition played significantly fewer trials on the online roulette game gambling for money compared to all other experimental conditions. These findings were supported by Frahn et al. (2015) who also investigated how exposure to practice modes influenced perceptions of control, gambling persistence and risk-taking using slot machines. One-hundred and twenty eight participants were allocated to either a no practice condition or one of three experimental conditions: a loss condition, a profit condition and a profit plus pop-up condition where participants would periodically receive an encouraging message. Messages were designed to promote greater confidence by misrepresenting skill; for example: “you’re one of our most skilful players!” They then compared each group’s behaviour when playing with real money. Contrary to Bednarz et al. (2013), Frahn et al. (2015) found no effects of free-play on later gambling persistence when gambling with real-money, but showed that those who had inflated payout rates (the winning and winning plus pop-up condition) placed larger bets compared to the control group. These results were not replicated when comparing the loss and control group suggesting that demo modes may only result in riskier gambling when presented as profitable. That is, demo sites that include inflated payout rates are likely to result in greater expenditures when people transition to gambling with real-money.

While many simulated gambling products offer advertisements or messages that promote fictitious beliefs about one’s ability to gamble (Derevensky et al. 2010; Frahn et al. 2015; King et al. 2010; Sévigny et al. 2005), Frahn et al. (2015) suggests that fictitious beliefs may be a secondary concern when it comes to influencing real gambling. Their results showed no differences between profit conditions where participants did or did not receive pop up messages promoting fictitious beliefs or an overconfidence in a person’s ability to gamble. Instead, it appears that this misrepresentation of winning is more likely to determine how a person subsequently gambles with real-money. Based on their observations of betting behaviours, Frahn et al. (2015) further suggested that participants failed to notice the change in payout rate from the free-play mode to the real-money modes as they did not change their bet sizes during non-profitable phases. They concluded that mere exposure to practice modes themselves are not likely to generate risk-taking behaviour unless they involve inflated payout rates. Given that many demo or practice games provide inflated payout rates compared to the real version, those who engage with free-play

products may be at risk of spending more money and showing greater gambling persistence when playing for real-money.

As many of these free-play products provide inflated return to player rates (Frahn et al. 2015; King et al. 2010; Sévigny et al. 2005), and even adults have failed to identify rate reductions in real modes (Bednarz et al. 2013; Frahn et al. 2015), free-play modes may generate early misconceptions in youth about the chance of winning when gambling with money. In line with research on adult populations (Bednarz et al. 2013; Frahn et al. 2015), some authors suggest that practice games that accurately portray the return to player rate of real monetary games may serve to promote safer gambling behaviours and knowledge about the chances of winning on chance based games (King et al. 2014). However, as many do in fact incorporate inflated payout rates it is likely that practice games may serve to encourage or facilitate misconceptions about gambling. When adolescents progress to real-monetary forms, it is likely they will underestimate the consequences associated with gambling and potentially make riskier gambling decisions based on feeling more confident in their ability to gamble.

### **Provides an Early Big Win**

Experiencing a big win early in one's gambling career is linked with the development of gambling problems (Wood et al. 2007). Big wins serve to reinforce gambling and develop expectations about gambling outcomes (Delfabbro et al. 2014). Demo or practice modes will often provide consumers with a “big win” due, in part, to inflated pay out rates and the rapid event frequencies offered by digitisation (Wood et al. 2007). However, simulated gambling games can also be manufactured to provide players with in-game outcomes, such as big wins, depending on their prior experiences within the game (Gainsbury et al. 2014a). Many simulated games can actually artificially create situations where consumers receive a big win early in their gambling session (King et al. 2010). Whether a big win in simulated gambling has a similar effect as big wins experienced in real-gambling is yet to be determined.

The impact of big wins in early gambling experiences has been demonstrated in a study by Delfabbro and Thrupp (2003) who surveyed 505 adolescents between the ages 15–17 years on their gambling experiences. Those who reported experiencing a big win (\$100–\$760) within their first few gambling attempts were significantly more likely to display a higher gambling frequency in adolescence. Forty-five percent of those classified as regular gamblers ( $n = 74$ ) reported experiencing a big win early in their gambling career. These wins were also shown to be associated with gambling intentions. Those who experienced a big win early, were more likely to agree with statements that suggest that when they turn 18 they would visit adult gambling venues, gamble more than they do now, and would definitely gamble more regularly. They also said that they intended to try internet gambling in the future. Other research shows that youth who may be classified as problem gamblers were more likely to report having a large win in the early stages of gambling (43.5% compared to 38.2% of at risk and 11.0% of not at risk gamblers) (Lambos and Puglies 2007). Internet based gambling products—either simulated or monetary—provide big wins early in gambling episodes (King et al. 2014). Whether simulated outcomes reinforce future gambling in the same manner as wins received from monetary gambling remains unclear, however, they may serve to promote fictitious ideas about the chances of winning or receiving comparable wins in real gambling environments.

## Dissociation with/Insensitivity to Money

A concern relating to internet gambling is that the psychological value for electronic cash is less than if one were to gamble with “real” physical cash (Griffiths 1999, 2003; Griffiths et al. 2006). Electronic money, or “e-cash” has the propensity to disrupt a gambler’s perceptions of the value of their money holdings that would otherwise regulate expenditure, resulting in persistent gambling and a dissociation with how much one is spending (Griffiths et al. 2006). Simulated gambling games allow people to gamble with credits that are presented to them in the same manner as internet gambling websites, but have no value beyond that given within the game itself to unlock features or ingame experiences. As with chips or tokens used in casinos or electronic money with internet gambling, virtual money may desensitise people to the value of real-money.

Virtual money is a key feature in many simulated products, whether they be demo or practice modes or social, virtual world gambling games. Simulated gambling games often provide players with an initial pool of virtual credits with which to play. Once this allocation has been exhausted, in order to keep playing, players can choose to either pay money to purchase more virtual currency, or wait a predetermined amount of time for credits to replenish (Gainsbury et al. 2014a). It is likely that when playing these simulated demo games the focus will shift to the winning outcomes rather than losses and expenditures, as the latter brings no real consequences (Floros et al. 2013). Similarly, many of these games offer a “safety net” where players can save their game or reload with a fresh supply of credits, allowing for riskier gambling with minimal consequences (King et al. 2010, p. 177). When or if people then transition to real-monetary modes, this focus on the outcome (rather than expenditure) and the lower value placed on money (represented as credits rather than currency) may cause people to engage in less considered gambling and potentially increase expenditure.

## Encourages Real and Excessive Expenditure

According to Gainsbury et al.’s (2014a) taxonomy, to be classified as a simulated gambling game the game must be void of any financial transactions within game play. However, often gambling games (and non-gambling games for that matter) will encourage players to spend money by capping credits and encouraging in app purchase. This is known as the ‘freemium’ model, where the game might be free to play but may require or encourage in game purchases to improve the game play experience (Derevensky and Gainsbury 2016). Gambling simulations will often provide a capped amount of online credits and once this allocation has been exhausted, players are either encouraged to purchase additional credits (Gainsbury et al. 2014a; King et al. 2016) or to pursue the real gambling product (Frahn et al. 2015; Griffiths 2003) in order to continue playing the game. While it is not mandatory to make in game purchases (Derevensky and Gainsbury 2016), without them, the player is likely to be restricted from playing the game for a specified time period until credits are replenished (King et al. 2016).

Research suggests that financial investment in simulated game play is associated with increased game play and concurrent participation in monetary gambling (Gainsbury et al. 2016; King et al. 2016). A study by King et al. (2016) showed that of the 130 social casino game players aged 12–17 years surveyed (non-paying  $n = 78$ ; paying  $n = 52$ ), paying social casino players were more likely to be males, play more frequently and use a number of different simulated gambling products compared to non-paying social casino game

players. Paying players also reported more frequent engagement and greater monetary investment in real gambling. Similarly, in comparing paying to no-paying social casino game players, those who paid reported more symptoms of problem gambling, and higher psychological distress compared to non-paying social casino game users. Similar findings were reported by Kim et al. (2015), with microtransactions in simulated gambling being the sole predictor of the transition from social casino game use to monetary gambling. This was further supported by Gainsbury et al. (2016) in a sample of adult social casino gamblers. Those who reported to gamble as a direct result of simulated gambling involvement were more likely to have greater game play frequency and make in-game payments or purchases. More recent research has demonstrated similar results, with findings suggesting that the frequency and diversity of simulated game play as well as the extent of in-game purchase is related to problematic social casino game usage (Gainsbury et al. 2017).

While spending money within simulated gambling games may be comparable to spending money on any form of entertainment, it is likely that financial investment into a simulated gambling task may promote real monetary gambling. In their study, Gainsbury et al. (2016) found the most common motivator for transitioning from simulated gambling to monetary gambling was to win real money. This suggests that those who make financial investments in simulated games may be more inclined to gamble for real in order to receive a return for their investment. Alternatively, many advertisements promote real gambling by advertising or offering “free credits” or bonuses when players switched from simulated games to the real gambling version (McBride and Derevensky 2009; McMullan and Kervin 2012; Sévigny et al. 2005). However, these offers usually come with terms and conditions that restrict a person from cashing out until they have played a predetermined number of games or received a set amount of returns. For instance, one rule identified by Sévigny et al. (2005) was that people could not cash out, or wins would not be paid until players had played a minimum number of games or a minimum amount of money had been won with the “free credits” received. They used the following example to illustrate the terms placed on “free credits”:

Suppose a player inserts \$80 into the real play account and receives \$50 worth of free credits. The account totals \$130. It is interesting to note that if this player loses \$45, the site considers that she has lost her own money (\$45 out of \$80), and will allow for a cash out corresponding to \$35. But, if the player wins \$45 instead of losing \$45, then the site will not pay the player, claiming that she bet with the \$50 worth of free credits (not her \$80), and did not play enough games to receive the win! (Sévigny et al. 2005, p. 157).

Not only does this strategy mean that the gambling operators can manipulate the rules to pay less to their users, but people are required to gamble longer if they wish to take advantage of the “free credits” offered to them. Someone who may be thinking about switching from a demo mode to gamble real money may therefore end up gambling more, and spending more money, than they would have otherwise due to the misrepresentation of these “free” or bonus offers.

## Parental Factors and Simulated Gambling in Youth

Youth gambling is highly influenced by parental gambling participation, beliefs and attitudes. Those who have parents that gamble or approve of gambling are significantly more likely to gamble themselves (Delfabbro and Thrupp 2003). Non-gamblers are also less

likely to have parents or friends who gamble or approve of gambling. Environments that foster positive perceptions of gambling are more likely to result in youth experimenting or engaging with gambling related activities. These environments can also determine the extent to which youth participate in gambling activities and experience difficulties. For instance, regular gamblers are far more likely than non-regular gamblers to have approving families (Delfabbro and Thrupp 2003) and 80% of youth problem gamblers report having parents who gamble (Ipsos MORI 2009).

Compared to other consumptive and potentially harmful behaviours (i.e., cigarettes, alcohol and drugs), gambling does not seem high on the agenda in terms of issues discussed with children and adolescents (Ipsos MORI 2009). This is particularly concerning as many youth have reported gambling with their parents or a family member (Derevensky and Gupta 2007; Ipsos MORI 2009). Further, those whose first gambling experiences were with their parents are more likely to show a greater interest in gambling (Splevins et al. 2010). Parental gambling behaviours has also been related to participation in free-play or demo products. Of respondents in the British survey of youth who stated they liked to play simulated gambling games, 32% had parents who gambled and 47% believed their parents would condone gambling (Ipsos MORI 2009). However, results from a study by King and Delfabbro (2016a) suggest that while parental influences are instrumental in facilitating monetary gambling, simulated gambling engagement tended to be unsupervised by parents. They further suggest that engagement with simulated gambling products is more likely to occur in isolation or with peers with minimal parental input. This is concerning, particularly for youth who have parents that may not support gambling involvement, as parents are unable to instill accurate ideas about chance and probability or monitor simulated game usage.

## Discussion

The increasing dependence on portable media devices for work and play, and the widespread availability of a diverse range of simulated gambling products through such platforms, has presented new avenues through which gambling and gambling problems are likely to manifest. While these simulated gambling products are relatively new compared to traditional forms of gambling, they have infiltrated the marketplace and have been readily adopted by young, impressionable consumers (Derevensky and Gupta 2007; Griffiths and Wood 2007; Hardoon et al. 2002; Ipsos MORI 2009; King et al. 2014; McBride and Derevensky 2009). Very little is known about how simulated gambling is likely to impact gambling trajectories for the next generation.

Many authors have voiced concerns regarding simulated gambling products for youth and adolescents, questioning how products may impact on gambling initiation and the development of gambling problems (Derevensky and Gupta 2007; Griffiths 2003; Ipsos MORI 2009; King et al. 2010, 2014; Messerlian et al. 2004; Williams and Wood 2007). Numerous studies have found associations between simulated gambling involvement, monetary gambling (Dussault et al. 2017; Gainsbury et al. 2016; Griffiths and Barnes 2008; Kim et al. 2015; King et al. 2016) and gambling problems (Gainsbury et al. 2016; Hardoon et al. 2002; Ipsos MORI 2009; King and Delfabbro 2016a; King et al. 2014). However, the causal relationship is yet to be fully understood.

While it is likely that involvement with simulated gambling products may contribute to the development of monetary gambling and gambling problems, an alternate explanation is



that higher participation by those experiencing problems may reflect an effort to reduce monetary gambling activities by replacing them with non-monetary forms. Engaging in simulated gambling activities does not necessarily mean that consumers will transition to real gambling (McBride and Derevensky 2009). It is likely that there may be other factors, beyond the simulated gambling activity itself that promote monetary gambling engagement. For instance, Hollingshead et al. (2016) suggest that those who play simulated games to reduce gambling cravings report an overall decrease in monetary gambling whilst those playing for excitement or to cope with negative life events report no change to real gambling involvement. However, those playing simulated games for social interactions and to build gambling skills are more likely to experience an increase in monetary gambling involvement. The impact of simulated gambling on monetary gambling is therefore determined by the motivation behind simulated game play. Speculatively, for some, simulated gambling may be used constructively as a tool to ease gambling urges, while for others, simulated gambling is likely to promote monetary gambling.

Compared to older populations, younger generations are more likely to be “techno savvy” and less techno-phobic when it comes to online activities (Griffiths 2003, 2005). As younger generations grow up in a media orientated environment, the intergenerational impact of simulated gambling is yet to be realised. Given the increasing popularity and availability of these products (King et al. 2010, 2014), policymakers have expressed growing concerns about how practice and standalone gambling games may impact on the development of gambling problems (Gainsbury et al. 2014a).

This review demonstrates that simulated gambling involvement is likely to encourage and promote monetary gambling; a finding largely based on correlational research using cross-sectional methodologies. There is a need for research to consider the impact of simulated gambling on monetary gambling from a causal perspective. Despite the limited literature exploring the causal relationship between simulated and monetary gambling, this paper suggest that simulated gambling may increase gambling exposure and encourage experimentation with real, monetary gambling. Further, simulated credits and inflated payout rates are likely to impact gambling expectancies; encouraging the idea that gambling is lucrative and fostering an insensitivity to the value of money. Understanding how people transition between simulated and monetary gambling will allow for both researchers and policymakers to better address the potential consequences of simulated gambling for young consumers (Derevensky and Gainsbury 2016).

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### Compliance with Ethical Standards

**Conflict of interest** The authors declare they have no conflicts of interest.

**Ethical Approval** This article does not contain any studies with human participants or animals performed by any of the authors.

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