# Virtual addictions: An examination of problematic social casino game use among at-risk gamblers

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## Abstract

The overlap of gaming and gambling activities within online digital technologies is of growing relevance to the study of technological addictions. Social casino games are immensely popular 'free to play' games that offer realistic emulation of financial gambling activities. Their structural similarities might suggest that engagement in social casino games may be particularly risky for people with existing gambling problems. Currently it is not known whether social casino games are used problematically by individuals who also experience problematic gambling, the extent of this overlap, the characteristics of those who experience problems with both activities, and the symptoms of problematic social casino game use they experience. An online survey was administered to Internet users ($N$ = 1,554) to assess social casino game use and associated problems. This study examined a subsample of 176 adults who played social casino games and reported self-identified gambling problems. The results indicated that a greater frequency and diversity of social casino game playing and more frequent and larger expenditure on social casino games was significantly positively associated with symptom severity of problematic social casino game use. Gamblers who were younger, less educated, spoke a non-English language, and with higher psychological distress, were more likely to report greater problems. Playing social casino games to escape or relieve a negative mood was the most commonly reported symptom. These findings suggest that some problem gamblers may also be at risk of problematic engagement in online gambling activities that lack financial incentives. Gamblers' concurrent engagement in social casino games therefore warrants further consideration in gambling research studies and clinical practice settings.

**Keywords**: problem gambling; social casino games; Internet gaming disorder; technology-based addiction; freemium; Internet addiction

## INTRODUCTION

There is growing recognition of the potential harms associated with excessive behaviours that occur predominantly online. One online activity that is receiving more attention is 'social gaming', which refers to games that are connected to social media sites, or through smartphone applications ('apps'). Social games have grown rapidly in popularity and attract, on average, an estimated 800 million monthly users worldwide (Morgan Stanley, 2012). A survey of Facebook users reported that there are over 3.5 million social gamers across Australia and almost 70% play social games daily (Spiral Media, 2013). One of the most popular subtypes of social games are 'social casino games', which refers to games which simulate casino or other gambling activities (Gainsbury, Hing, Delfabbro, & King, 2014). Social casino games are distinct from gambling activities as they do not require payment to play, nor do they provide a direct payout or monetary prizes (Gainsbury et al., 2014). Despite this, there are structural similarities between these two classes of activity in relation to their appearance, mechanisms of play, and pattern of rewards. This has led to speculation about the cross-over of individuals between gambling and social casino games and the impact of these games on vulnerable populations, including problem gamblers (Derevensky & Gainsbury, 2015; King, Delfabbro, & Griffiths, 2012). The present study was designed to examine the use of social casino games among individuals with self-identified gambling problems.

### *Social casino games: A growing market*

The central theme of social casino games is a simulation of a gambling activity (e.g., poker, slots, roulette, bingo, keno, betting). For example, users may play poker against other users, casino games against the 'house', or 'wager' on real sports and race events. Wins are acknowledged with the award of virtual currency and users move up and down on leaderboards, which they can share with their online peers for acknowledgment of their success. Unlike gambling activities, social casino games are not always based on random outcomes and chance, but employ algorithms designed to enhance user enjoyment and encourage continued play (Sapsted, 2013). Social casino games are social by design, with users interacting directly through game play, sharing outcomes and online communication.. Users are typically provided with a small amount of virtual currency to start play, with the option to purchase additional currency to enable further game play or an enhanced game experience (e.g., access to additional game features). Importantly, users are not able to exchange the virtual currency for monetary equivalents. However, there are some emerging hybrid models that enable users to exchange their virtual currency for items of monetary value (Gainsbury et al., 2014).

Social casino games are one of the most lucrative social gaming categories and the value of the global social casino market is expected to reach US$3.4 billion by 2015 (Kushnir, 2014; SuperData, 2015). Due to their similarities with online gambling, concerns have been raised that social casino games may have similar addictive potential (Government of South Australia, 2013; Parke, Wardle, Rigbye, & Parke, 2013). However, few studies have specifically examined the nature of problematic use of social casino games, including whether this activity may involve excessive financial expenditure and whether this may lead to subsequent problems for some users. Furthermore, the majority of studies that have examined the use of social casino games (and problematic online gaming) have focused on adolescent and youth populations (Ipsos MORI, 2009; King, Delfabbro, Kaptsis, & Zwaans, 2014; Paskus & Derevensky, 2013). Given that the average age of a typical social casino game user is estimated to be 35 to 44 years (Gainsbury, Russell, & Hing, 2014; GamblingData, 2012; Macquarie, 2013), as well as the fact that older populations may have greater means to spend money online, the lack of research on this population represents a significant gap in the literature.

*The overlap of social casino gaming and gambling*

For many users, social casino games represent a more casual and less threatening environment than online gambling sites (Masterminds Advertising, 2012). There is considerable overlap between those who choose to play social casino games and those who engage in gambling, including online gambling. Studies of adolescents have found that young people who play online gambling-themed games are more likely to report an interest in and engage in gambling than those who do not (King et al. , 2012; King et al., 2014; Ipsos MORI, 2009; McBride & Derevensky, 2012). One report estimated that 71% of Australian social casino game users visit land-based venues and almost 80% gamble online (SuperData, 2015). Similarly, 83% of US social casino game users visit a land-based casino at least once a year (Superdata, 2013). A survey of 2,010 Australian adult gamblers found that 13.4% also played social casino games and that social casino game users were more likely to gamble online, be more involved gamblers and have more positive attitudes toward gambling than those who did not play social casino games (Gainsbury, Russell, & Hing, 2014). Furthermore, social casino game users were significantly more likely to smoke daily, use illicit drugs, have higher psychological distress, and be classified as problem gamblers, as compared to non-social casino game users. This notion of overlapping technological addictions was consistent with past studies reporting that problematic Internet gaming and gambling may co-occur (King et al., 2012; Mihaylova & Kairouz, 2010; Yau et al., 2014). Co-morbidity between addictive disorders is high (Black & Moyer, 2014; Lorains, Cowlishaw, & Thomas, 2011), therefore, it is likely that some social casino game users who experience gambling problems may also engage in these games excessively. However, it is not known whether all, or a subset of, individuals with gambling problems may be at risk of problematic social casino game use and what aspects of social casino game use and personal characteristics may be associated with

problematic use of these games. It could be argued that concerns that social casino games will result in addictive behaviour is a type of 'moral panic', or the result of highly emotive and rhetoric language in the public sphere (Cohen & Young, 1981). However, there is some preliminary evidence on the negative impacts of social casino games, and therefore it is important to consider whether social casino games pose risks to individuals negatively affected by gambling activities.

*Classifying problematic social casino game use*

There is no consensus on the clinical classification of problematic involvement in social casino games as these are only a recent technological development (King, Gainsbury, Delfabbro, Hing, & Abarbanel, in press; Gainsbury et al., 2014). It might be assumed that problematic social casino gaming resembles other behavioural addictions typically defined by characteristics including preoccupation, withdrawal, tolerance, unsuccessful attempts to reduce involvement, and negative consequences of use (Kardefelt-Winther, 2015; King, Haagsma, Delfabbro, Gradisar, & Griffiths, 2013). However, it would be premature to classify problematic social casino gaming in the same way as other behavioural disorders without supporting evidence. Despite their monetisation features, social casino games are not legally recognised as a form of gambling and therefore may not be considered relevant to gambling disorder classifications. A possible alternative is the proposed DSM-5 Internet Gaming Disorder classification; however, this set of criteria may not capture all relevant symptoms (e.g., excessive spending on virtual currency, 'chasing' losses). On this basis, some caution is needed in approaching the identification of problems associated with social casino gaming.

*The present study*

The main aim of this study was to examine whether similarities in problematic social casino gaming and problem gambling might be inferred from overlapping symptom profiles. In particular, this study examined: (1) whether social casino games are used problematically by users who also experience problem gambling; (2) the characteristics of individuals who experience problems with both activities; and (3) the most common symptoms of problematic social casino game among problem and at-risk gamblers. Factors related to greater endorsement of symptoms of problematic social casino game use were examined. These factors included demographic variables, social casino game activity, and psychological distress. It was hypothesised that greater involvement in social casino games in terms of frequency of use, extent of game play, financial expenditure, as well as greater psychological distress would be related to greater endorsement of symptoms of problematic play. A secondary objective was to provide some insight into the features of problematic social casino gaming, which may aid in developing the conceptualisation of such problems

## METHOD

*Participants*

A total of 176 adult social casino game users were selected from a pool of respondents in a larger project on online behaviour ($N$ = 1,554) (Author, 2015). Participants were recruited by a market research company, who compensated them a small amount directly, and the larger sample was representative of the Australian population by age and gender. The respondents were aged between 18-76 years ($M$ = 38.9, $SD$ = 15.0) and 54.0% were male. The respondents for the current study were selected on the basis that they had an existing vulnerability to gambling. The specific inclusion criterion was a score of 3 or more on the Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001), indicating 'moderate risk' or 'problem' gamblers. Ethics approval was granted by [deidentified] Human Research Ethics Committee. Participants provided consent and were informed that they were free to withdraw at any time. No personal information was collected.

*Survey instrument*

The survey instrument was completed online and was composed of the following measures:

1) *Demographics*: age, gender, marital status, household type, highest educational qualification, current work status, income, main language spoken at home, and country of birth.
2) *Kessler 6* (*K6:* Kessler et al., 2002): The K6 is a standardised measure of psychological distress employed in normal and clinical populations. Numerous scoring approaches exist for this scale (Kessler et al., 2012). Therefore, the current analysis treated scores as ordinal, with higher scores indicating higher levels of psychological distress. Cronbach's alpha for this scale was 0.94.
3) *Social casino game use*: Questions examined types of social casino games played (Lottery-type games, slots, sports betting, race betting, poker, casino games), frequency (including how often respondents played social casino games during a year and how many sessions they played in a day of social casino game play), duration of play, typical in-game purchases, whether the purchase cost was clear, and reasons for spending money on social casino games (to purchase gifts for friends; to take advantage of a special offer; to increase my level of enjoyment; to decorate or personalize the game; to get ahead in the game; to avoid waiting for or earning credits; the game isn't fun otherwise; to increase my level of enjoyment; as an impulse decision to continue play; and other).
4) *Problematic Social Casino Game Use Screen* (PSCGS): This 5-item screening measure was composed of items derived from the DSM-5 Internet Gaming Disorder criteria. It was assumed that problem video gaming was the most appropriate classification for social casino gaming. Items referred to preoccupation, withdrawal, loss of control, escape, and negative consequences, which are known to represent core components of problematic gaming (King, Haagsma et al., 2013). Respondents

indicated if they had experienced any of five symptoms within the past 12 months (see Table 1). Response options were yes/no. The five items were found to have acceptable reliability (Cronbach's alpha = 0.77; Guttman L2 = 0.77) and these reliability analyses suggested that removal of any of the items did not increase reliability. These items were thus treated as an ordinal scale, with higher scores indicating higher levels of problematic social casino game use. Scores ranged from 0 to 5 items endorsed.

*Data analysis*

Nonparametric statistical analyses were conducted because the PSCGS has not been validated and the PSCGS and K6 were not normally distributed (Shapiro-Wilk ($df$ = 176) = 0.85, $p$ < 0.001 and Shapiro-Wilk ($df$ = 176) = 0.96, $p$ < 0.001 respectively), and because some of the other variables were ordinal in nature (e.g. level of education). These analyses include the Mann-Whitney *U*-test, Kruskal-Wallis test, McNemar test and Spearman's correlations. An alpha of 0.05 was used throughout the analysis unless stated otherwise. There were no missing data for any of the variables, so all analyses are based on a total *N* of 176.

## RESULTS

The number and percentage of respondents endorsing 0 to 5 items on the PSCGS were: 67 (38.1%), 31 (17.6%), 27 (15.3%), 26 (14.8%), 7 (4.0%) and 18 (10.2%), respectively. A series of McNemar tests for analysis of proportion data obtained from the same participants revealed that escape or relief from a negative mood was endorsed by a significantly higher proportion of respondents compared to any of the other items ($p$ < 0.005 for comparisons with all four other items). The remaining four items were endorsed by 26.7-31.8% of respondents, with no significant differences between them (see Table 1).

Table 1

N (%) endorsing each item on the Problematic Social Casino Game Use Scale *(N* = 176)

| Thinking about your social casino game use, in the past 12 months | n (%) |
|---|---|
| *Escape or relief from a negative mood*: Have you used social casino games to escape from problems or to relieve a negative mood? | 78 (44.3) |
| *Unsuccessful attempts to stop or reduce:* Have you made many unsuccessful attempts to limit time spent on social casino games? | 56 (31.8) |
| *Preoccupation*: Have you had frequent thoughts about or frequent strong urges to use social casino games? | 52 (29.5) |
| *Withdrawal*: Have you felt sad or irritable when you could not use social casino | 48 (27.3) |

games?

| | |
|---|---|
| *Negative impacts*: Have you experienced any negative consequences due to social casino games use? (e.g., relationship problems, poor school or work performance, worse physical health) | 47 (26.7) |

*Demographics*

PSCGS scores were significantly and negatively related to age (Spearman's rho = -0.21, $p = 0.005$) and education (Spearman's rho = -0.21, $p = 0.007$). Respondents speaking a language other than English at home scored higher on the PSCGS (median = 2) than respondents who spoke English as their first language (median = 1; Mann-Whitney $U$ = 2,052, $Z$ = -3.39, $p$ = 0.001). Respondents with higher PGSI scores tended to have significantly higher scores on the PSCGS (Spearman's rho = 0.41, $p < 0.001$). Respondents with higher scores on the Kessler 6 scored higher on the PSCGS (Spearman's rho = 0.48, $p < 0.001$). No significant differences in PSCGS scores were found in terms of gender, marital status, different household types, work status, income, or country of birth.

*Social casino game use*

Of the six forms of social casino games surveyed, engagement in sports and race wagering, poker, and casino-themed games were related to a higher PSCGS scores (largest significant Mann-Whitney $U$ = 2,590.5, $Z$ = -3.03, $p$ = 0.002 for race wagering), although lottery and slot-style games were not ($p > 0.1$).

For each type of social casino game, more frequent use was significantly related to higher PSCGS scores (lowest Spearman's rho = 0.17, $p$ = 0.025 for lottery type games; highest Spearman's rho = 0.38, $p < 0.001$ for other casino-style card or table games), as was a greater number of sessions of play per day (Spearman's rho = 0.42, $p < 0.001$). Furthermore, those who engaged in a greater number of types of social casino games were significantly more likely to report higher PSCGS scores (Spearman's rho = 0.33, $p < 0.001$).

*Financial expenditure on social casino games*

A majority ($n$ = 123, 69.9%) of respondents had paid real money to play social casino games and these respondents had significantly higher PSCGS scores (median = 2) compared to those who reported that they did not pay real money (median = 1; Mann-Whitney $U$ = 2,343.5, $Z$ = -3.06, $p$ = 0.002). Those who had spent money on slot-machine social casino games ($n$ = 21) had significantly higher PSCGS scores (median = 2.5) compared to those who had not ($n$ = 155; median = 1; Mann-Whitney $U$ = 2,169, $Z$ = -3.11, $p$ = 0.002). However, no significant differences were found in PSCGS scores based on expenditure on other game types.

Those who had spent money on social casino games tended to do so weekly or more frequently (41.5%), with a further 25.2% paying on a monthly basis. Expenditure was collected in brackets, with 14.6% reporting spending <$1 per purchase, 11.4% spent $1-$5,

19.5% spent $6-$10, 22.8% spent$11-$20, 20.3% spent $21-$50 and 11.4% spent $51 or more.

Significantly higher PSCGS scores were related to: more frequent expenditure on social casino games (Spearman's rho = 0.48, $p < 0.001$), higher levels of expenditure on social casino games in general (Spearman's rho = 0.34, $p < 0.001$) and expenditure on a greater number of different types of social casino games (Spearman's rho = 0.42, $p < 0.001$). Those with higher PSCGS scores were significantly more likely to agree that the cost of purchase was clear to them before purchase (Spearman's rho = 0.19, $p = 0.037$).

*Reasons for spending money on social casino games*

Three reasons to spend money on social casino games were significantly related to higher PSCGS scores: to purchase gifts for friends (Mann-Whitney $U = 816.5$, $Z = -2.22$, $p = 0.026$; 23 respondents endorsed this item while 100 did not); to take advantage of a special offer (Mann-Whitney $U = 894.5$, $Z = -2.13$, $p = 0.033$; 25 respondents endorsed this item while 98 did not) and to increase my level of enjoyment (Mann-Whitney $U = 948.5$, $Z = -1.99$, $p = 0.047$; 26 respondents endorsed this item while 97 did not). The remaining reasons were not significantly related to the PSCGS.

## DISCUSSION

Advances in digital media technologies have enabled an abundance of online gambling and gambling-like opportunities. The extent to which social casino games may present additional difficulties for vulnerable populations is currently not well understood. In this context, the present study investigated social casino gaming in a sample of at-risk or problem gamblers. There was a significant association between problematic gambling and problematic social casino gaming, with those individuals with greater problem gambling severity tending to endorse more problematic gaming symptoms. A significant minority (10%) of problem gamblers in our sample reported to experience problematic use of social casino games. This indicates that a proportion of problem gamblers may be at risk of experiencing a similar range of problems arising from social casino gaming, despite the lack of financial incentives associated with these activities. This observation is novel within the field of technology-based addictions, and has several conceptual and clinical implications that will be critically discussed.

This study showed that social casino gaming problems were higher among younger respondents, those with lower levels of education, and non-English speakers. These findings were similar to those reported in studies of predictors of problematic gambling (Gainsbury, Russell, Hing et al.,2014; Hing, Russell, Tolchard & Nower, 2015; Johansson, Grant, Kim, Odlaug, & Götestam, 2009; Raylu & Oei, 2004). Similarly, problem gambling and use of social casino games has been found to be positively associated in adolescent and young adult studies (Ipsos MORI, 2009; King, Delfabbro, Kaptsis, & Zwaans, 2014; Paskus &

Derevensky, 2013). Further studies may wish to target these more vulnerable populations to investigate the nature of problematic social casino gaming and its correlates, or to further examine the co-existence of gaming and gambling problems.

The relationship between problematic social casino game use and engagement with these games was also considered. As hypothesised, greater involvement in social casino games in terms of number of games played, more frequent sessions, higher and more frequent financial expenditure, and expenditure on more game types was related to greater problematic symptomatology. Similarly, intensity of engagement is also related to problematic gambling, problematic Internet Use and Internet Gaming Disorder (Gainsbury, Russell, & Hing, 2014; Huang, 2006; King, Haagsma et al., 2013; Messias, Castro, Saini, Usman, & Peeples, 2011; van Rooij, Zinn, Schoenmakers, & van de Mheen, 2012). Our findings suggest that problematic social casino game use shares some common indicators with these behavioral addictions.

Greater severity of problematic social casino gaming symptoms was associated with higher levels of psychological distress. This relationship was consistent with past literature on problematic Internet gaming (Gentile, 2009; King, Delfabbro, & Griffiths2013) and problematic gambling (Blaszczynski & Nower, 2002). Almost half of the participants reported playing social casino games to escape from problems or relieve a negative mood, and this was the most endorsed symptom of problematic social casino game use. It is not clear from these data, however, whether the negative mood in question specifically refers to feelings toward the gaming activity (e.g., psychological withdrawal, such as irritability), reactivity to adverse life circumstances, or mood changes related to concurrent gambling activities and related problems. It is possible that the gamblers in this study used social casino games to cope at times when gambling was not an available option, or to cope with distress arising from other life difficulties or other mental health issues.

In this study, the majority of respondents had paid real money to play social casino games. These respondents had significantly higher PSCGS scores compared to those who reported not paying real money. This might suggest that problematic social casino game users are more likely to spend money, owing to individual characteristics such as self-regulation difficulties or impulsive tendencies, which are both associated with problematic Internet gaming (Gentile et al., 2011; Yau, Crowley, Mayes, & Potenza, 2012). Another possibility is that financial expenditure in social casino games influences problematic playing tendencies by creating a larger psychological investment in the game thereby influencing users to play regularly to preserve their investment (King & Delfabbro, 2014). That is, the investment of real money in virtual goods or currency may inflate the perceived value of such currency. Although the results suggest financial expenditure can be implicated in problematic social casino gaming, it should be noted that it is nevertheless possible for users to experience negative consequences without associated expenditure. Spending money on games may be just one metric indicating a high level of engagement with these games. It may be misleading,

then, to specify financial expenditure as a required indicator for screening harm associated with simulated gambling.

The clinical utility of these findings relate primarily to conceptualisation and assessment. First, it may be worthwhile screening for problematic casino gaming at the same time as financial gambling. Does the individual have problems with multiple forms of gambling, including those which do not involve direct financial return? Second, it is possible that social casino gaming may be relevant to conceptualising the gamblers' problems. For example, social casino gaming might be a maintaining factor for the gambling activity (i.e., does it keep the individual engaged in certain activities even when they have exhausted their finances?), or whether the social casino gaming is an initiating factor (i.e., does it trigger gambling with real money?). Third, it may be important for clinicians to recognise and inform their clients that social casino gambling can produce problems that resemble gambling or gaming problems despite the relative lack of financial expenditure.

*Limitations*

Several limitations of this study warrant acknowledgement to guide and refine future work in this area. Although a large population sample (i.e., over 1,500 people) was initially obtained, the presented analyses are based only on a small subset of people who are at-risk of gambling problems. In part, this reflects the scale of the problems associated with technological addictions, suggesting that there is a need for large samples, or targeted samples, to be employed. The research was not intended to be representative and therefore these results should not be generalized to the general population. Additionally, biases common in addiction research should be considered, such as lack of insight, or denial, minimization or reattribution of problems, or erroneous responding. The design of this study did not enable statements of causality. The nonparametric statistical procedures used were deemed necessary due to the nature of the data, but were limited in regard to controlling for covariance amongst predictors. Finally, the screening tool for problematic social casino games was designed to be brief for the purpose of the project. This screen was not intended to provide clinical cut-off scores, nor indicate a particular diagnoses Future studies should explore the overlap between gambling and social casino gaming and associated problems in a wider representation of the population, including non-problem gamblers. Research is also needed to further understanding of the experience of psychological distress among social casino gamers and the potential for users to experience significant problems related to these online games.

*Conclusion*

The convergence of gaming and gambling activities represents an evolving context for technological addictions. Social casino gaming represents one such nexus, an activity wherein users are able to experience the basic mechanics of gambling without the requirement of spending money. This study was novel in its focus on the nature of problematic social casino game play among vulnerable gamblers, which is a previously

unexplored area of gambling research. It was shown that some problem gamblers may be at risk of problematic social casino game use, despite the lack of financial incentives to play. These findings suggest firstly that screening measures for problem gambling may need to consider gaming and gambling-like activities that operate in conjunction with gambling as a possible comorbidity. Additionally, the treatment of problem gambling among technologically involved individuals may need to consider the influence of digital gambling-like experiences, such as social casino games.

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