



Full length article

Is gambling involvement a confounding variable for the relationship between Internet gambling and gambling problem severity?

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ARTICLE INFO

Article history:

Received 6 December 2016

Received in revised form

26 January 2017

Accepted 1 February 2017

Available online 1 February 2017

Keywords:

Addiction

Adolescents

Diversity of gambling formats

Internet gambling

Time spent gambling

ABSTRACT

Internet gamblers have more problems gambling than land-based gamblers, but recent studies showed that Internet gamblers are involved in a higher number of gambling activities, which may confound the relationship between Internet gambling and gambling problems. The present study aimed to test whether the relationship between Internet gambling and gambling problems persisted when including variables related to gambling involvement as predictors, namely time spent gambling and diversity of gambling formats. Data from a large sample of French adolescents ($n = 9910$) were used. Associations between disordered gambling/money spent gambling with Internet gambling were performed using generalized linear models, not controlling and controlling for diversity of gambling formats and time spent gambling. The results showed that Internet gamblers had significantly more problems than land-based gamblers. The relationship decreased when diversity of gambling formats and time spent gambling were controlled separately, and became non-significant when they were both included in the model. To conclude, time spent gambling and diversity of gambling formats rather than Internet gambling should be considered a detrimental gambling behavior. They seemed to capture different aspects of gambling patterns. This study was a step forward in changing the conceptual model of problem gambling, with gambling involvement as a main variable.

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1. Introduction

Disordered gambling is a major health concern with several detrimental health correlates (Gainsbury, Wood, Russell, Hing, & Blaszczynski, 2012; Jiménez-Murcia et al., 2011; Wardle, Moody, Griffiths, Orford, & Volberg, 2011). Understanding how people gamble is therefore essential, and many studies have investigated associations of disordered gambling with game-specific engagement, such as types of games played and Internet versus land-based gambling. Traditionally, certain types of gambling have been described as more addictive than others (Jiménez-Murcia

et al., 2011; LaPlante, Nelson, LaBrie, & Shaffer, 2011). For example, slot machines are associated with higher levels of disordered gambling than other types of gambling (Desai, Maciejewski, Dausey, Caldarone, & Potenza, 2004), and Internet gamblers are more likely to report disordered gambling than are land-based gamblers (Gainsbury et al., 2012; Jiménez-Murcia et al., 2011; Wardle et al., 2011).

Recent studies reported that gambling involvement such as the number of gambling formats and time spent gambling should be taken into account when studying the relationship between game-specific engagement and disordered gambling (LaPlante, Nelson, & Gray, 2014). Indeed, both the number of gambling formats and time spent gambling are predictive of gambling problem severity and thus may be confounders. Recently, some studies showed that when controlling for these variables, the relationship between game-specific engagement and disordered gambling disappeared

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or decreased (LaPlante et al., 2014; Philander & MacKay, 2014). Thus, the conception of risky gambling is changing, shifting from specific-game engagement to gambling involvement as the dominant risk factor (LaPlante et al., 2014; LaPlante et al., 2011).

However, research investigating time spent gambling and Internet versus land-based gambling is scarce, even if recent studies highlighted that Internet gamblers are more heavily involved in gambling (Wood & Williams, 2011). For example, LaPlante et al. (2014) investigated associations of types of gambling formats with disordered gambling with and without controlling for the frequency with which individuals gambled. They concluded that the number of gambling formats has a greater detrimental association with problem gambling than the gambling frequency. However, the authors did not focus on the difference between Internet versus land-based gambling. Other studies (Canale, Griffiths, Vieno, Siciliano, & Molinaro, 2016; Philander & MacKay, 2014) investigated the association of Internet/land-based gambling with disordered gambling, but they controlled for the number of gambling formats and not for the time spent gambling. The results were inconsistent, since one study reported a non-significant relationship between Internet gambling when the number of gambling formats is controlled for (Philander & MacKay, 2014) whereas the other reported a significant relationship (Canale et al., 2016). Other studies controlled for modes of accessing Internet gambling (Gainsbury, Liu, Russell, & Teichert, 2016) and use of multiple gambling accounts (Gainsbury, Russell, Blaszczynski, & Hing, 2015) and showed that these patterns were associated with subsequent harms. However, again, time spent gambling was not taken into account. Therefore, it is unclear whether the findings provided information about Internet gambling, diversity of gambling formats or time spent gambling.

This study aims to fill in this gap and includes both diversity of gambling formats and time spent gambling as confounders to investigate the relationship between Internet gambling and gambling problem severity, measured with disordered gambling and money spent gambling. In accordance with the recent change in conception of risky gambling (LaPlante et al., 2014), we hypothesized that controlling for time spent gambling and diversity of gambling formats, the relationship between Internet gambling and gambling problem severity would not persist. The objective of the study was to show that Internet gambling is not necessarily a harmful gambling pattern in itself, and to achieve a better understanding of gambling behaviors and associated harms. The study focused on a population-based sample of adolescents, because research on this population is needed (Canale et al., 2016). Adolescents are concerned with excessive use of entertainment technologies (computer and video games, Internet), which may be related to online gambling. Additionally, gambling is becoming a popular pastime among adolescents (Derevensky, 2012). However, data are scarce in this age group.

2. Methods

2.1. Participants and procedures

Data were collected in the seventh ESCAPAD survey (Survey on Health and Behavior), a cross-sectional survey designed to estimate drug use prevalence in France (March 2011), conducted by the French Monitoring Centre for Drugs and Drug Addiction in association with the National Service Department (Spilka, Le Nézet, & Tovar, 2012). It took place during the compulsory one-day session providing all 17-year-old French adolescents (boys and girls) with civil and military information (i.e., the national defense preparation day) in all the civilian and military centers across the metropolitan and overseas territories. The survey was approved by the National

Council for Statistical Information and the ethics commission of the National Data Protection Authority. In 2011, a total of 32,249 French adolescents were surveyed, with a response rate exceeding 98%. The final sample comprised 27,402 French adolescents aged 17 living in metropolitan France. This study focused on the 10,156 teenagers who had gambled during the previous 12 months (37.1% of the total sample). Missing values were listwise deleted, which left a final sample of $n = 9910$ (97.6% of the gamblers).

2.2. Measures

2.2.1. Disordered gambling

Disordered gambling was assessed using the Problem Gambling Severity Index (PGSI) (Ferris & Wynne, 2001), including nine questions on a four-point scale and for the period of the previous 12 months. A sum-score has been computed, with a higher score indicating more gambling problems.

2.2.2. Money spent gambling

Participants were asked how much money they had spent the last time they gambled (in euros). This measure was used as an indicator of gambling problem severity.

2.2.3. Diversity of gambling formats

The diversity of gambling formats was recorded by counting the number of gambling formats, ranging from 1 to 4, according to the four distinct dimensions listed to assess time spent gambling.

2.2.4. Time spent gambling

Participants were asked how much time they had spent gambling during the previous 12 months. They answered with regard to four distinct dimensions: 1) lottery games, e.g., scratch lottery, numbers games; 2) sport betting and pool games; 3) casino games and gambling machines, e.g., poker, roulette, slot machines; and 4) "other." In each of these, answers were collected on a six-point closed-ended scale: "never," "one time per month or less," "2–3 times per month," "about one time per week," "2–6 times per week," and "every day." A total number of days spent gambling was determined by summing the four dimensions, using never = 0, one time per month or less = 12, 2–3 times per month = 30, 2 about one time per week = 52, 2–6 times per week = 208, and every day = 365.

2.2.5. Internet gambling

Participants were asked whether they had gambled on Internet or not for each of the four above dimensions (lottery games, sport betting and pool games, casino games and gambling machines, and others) at least one time during the previous 12 months. Participants who answered "yes" in at least one dimension were recorded as Internet gamblers, whereas the others were recorded as land-based gamblers.

2.2.6. Covariates

Age in years, gender, and parental occupational status ("higher and intermediate", "lower", and "other": jobless parents and unknown occupational status) were assessed.

2.3. Statistical analyses

First, descriptive statistics and bivariate associations between Internet/land-based gambling and outcomes were computed. Mann-Whitney tests and chi-squares were used according to the distribution of the variables. Then, generalized linear models (GLM) were computed using Internet gambling as a predictor of disordered gambling (model 1a) and money spent gambling (model 1b).

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