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# Gambling onset and progression in a sample of at-risk gamblers from the general population <sup>☆</sup>

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## ABSTRACT

The goal of this study was to investigate gambling-related behavior, onset and progression in a sample of at-risk gamblers from the community. A national household survey was conducted in Brazil, covering individuals 14 years old or older. Subjects were screened for at-risk gambling, those testing positive answered a questionnaire about gambling progression, preferred games and DSM-IV pathological gambling criteria. Out of 3007 respondents, 118 were considered at-risk gamblers according to the Lie/Bet Questionnaire. According to the DSM-IV, 32.7% and 24.9% of those were considered problem and pathological gamblers, respectively. Early at-risk gamblers (onset prior to 20 years of age), were more likely to be male, to prefer non-commercially structured games, and to chase losses while gambling. Young pathological gamblers (under 35 years of age) progressed faster from regular to problem gambling (roughly 2 years) than mature pathological gamblers (12 years). Such findings had not been described before because previous reports focused mostly on clinical samples that lack young, male, early-onset gamblers. Gambling programs have not satisfactorily covered this segment of gamblers. Outreach strategies and early interventions should be provided to prevent these individuals from rapidly evolving into pathological gambling.

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## 1. Introduction

Pathological gambling is an increasing concern. Studies from various countries report pathological gambling prevalence rates ranging from 0.4% to 2.1% (Weinstock et al., 2008). There is evidence that the prevalence of pathological gambling increases as gambling is made more available (Cox et al., 2005).

Gambling is distributed in the population across a continuum that can be divided in stages ranging from non-gambling to social gambling, problem gambling and severe gambling addiction (i.e.,

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pathological gambling). Scientific reports on gambling have focused on the pathological extreme of that continuum because most studies focus mainly on clinical samples. Therefore, community-based studies are important because they can circumvent treatment-seeking bias and provide balanced samples that represent the various degrees of gambling. In fact, a community-based survey conducted in New Zealand found that the proportion of individuals experiencing gambling harms was greater than that of those strictly meeting the criteria for problem or pathological gambling (Walker et al., 2012), underscoring the importance of investigating at-risk, subclinical gamblers, who most likely will not be found in clinical settings.

The paucity of community-based data on gambling is noteworthy, particularly in low- and middle-income countries (LAMICs). In a household survey in Brazil, problematic gambling was associated with male gender (3:1 male-to-female ratio), low level of education, unemployment and living in a metropolis (Tavares et al., 2010).

Spritzer et al. (2011) showed that adolescent gambling was associated with school dropout and low religiosity. Another LAMIC community-based study, conducted in South Africa, confirmed the association between at-risk/problem gambling and high urbanization, with a predominance of engagement in unlicensed non-commercial gambling (Dellis et al., 2013). In developed countries, disordered gambling has been associated with lower age, low income (Ladouceur et al., 2005) and minority status (Black et al., 2012). Regardless of the level of income or social development, problem gambling seems to be strongly associated with a host of demographic variables that are indicative of loneliness and poor social integration (Afifi et al., 2010; Tavares et al., 2010).

In clinically based studies (Tavares et al., 2001, 2003), it has been reported that women progress rapidly from social to pathological gambling and express a preference for electronic gambling machines. Nelson et al. (2006) studied gambling trajectories in 2256 pathological gamblers entering treatment. The authors found that women tended to initiate gambling later than did men, although late onset of gambling behavior seemed to be a better determinant of rapid progression to pathological gambling than was gender. In addition to its impact on gambling progression, age of onset is thought to be a marker of pathological gambling subgroups. It has been demonstrated that, in comparison with late-onset gamblers, early-onset gamblers are more often male, have more comorbidities (psychiatric and medical) and show greater gambling severity (Burge et al., 2004). Accordingly, data from community-based surveys have also indicated that early adolescent onset of gambling behavior is associated with conduct disorder (Welte et al., 2009) and greater gambling severity (Rahman et al., 2012).

Using data from the Brazilian household survey on gambling (Tavares et al., 2010), the present study had the following goals: (I) to investigate the associations between at-risk gambling and gender, socio-demographic characteristics, preferred game, gambling onset, recognition and persistence of gambling problems, and gambling progression; (II) to investigate differences between early- and late-onsets at-risk gamblers; (III) to explore age-based subgroups within the category of pathological gamblers.

## 2. Methods

### 2.1. Sampling

The Brazilian National Survey on Alcohol Consumption Patterns, which was aimed at assessing drinking and harmful alcohol-related behaviors, was carried out between November 2005 and April 2006. It included a gambling behavior assessment section (Tavares et al., 2010). Further details of the assessment package and related methodology are available in Castro-Costa et al. (2008). It was a household survey that included 143 cities, amounting to 325 census sectors (IBGE, 2008). The sample was designed to represent the Brazilian population aging 14 years or older, of both genders, encompassing rural and urban areas nationwide. The survey did not include non-Portuguese speakers living in Brazil; individuals with mental retardation or any other condition that would preclude consent and compliance with the investigation; indigenous individuals living on reservations or in institutions such as hospitals and shelters, or individuals engaged in internships or military service.

For the sample construction, a three-stage probabilistic procedure was adopted (Hansen et al., 1993). First, cities were stratified by size and region. In each of the 25 strata established, cities were ordered by mean income, then submitted to systematic selection proportional to the estimated size of the local population (IBGE, 2008). Finally, census sectors were selected from the chosen cities.

In the second stage, the jurisdictions were ordered according to the mean income of the population and then selected according to population and sector size. A household counting was performed in each sector. The households were selected according to a random numerical table, the target being eight interviews by sector. The number of selected households was set considering non-response rates previously reported (DataUFF, 2009).

The interviewer was required to approach any given selected household at least three times at different times of the day on two different days, at least one of them

being a weekend day. No substitution of household was allowed in case of contact failure. Once contact had been successfully established, the interviewer surveyed all members of the household aging 14 years old or older. The resident whose date of birth was the closest to the current date was selected to be interviewed. Weights were attributed according to procedures applied in recent major North-American surveys: first a base weight inversely corresponding to the probability of household selection, then another related to the total number of inhabitants in the household. A non-response weight adjusted for gender and education was used. Finally, a post-stratification weight was applied to adjust the demographic variables to population numbers previously reported (IBGE, 2008).

The sampling error was established at 2% for a confidence interval of 95%. The final sample was composed of two parts: a normal sample, representative of the Brazilian population, and an oversample of subjects between 14 and 17 years of age, which allowed for some targeted analysis of this subpopulation (Spritzer et al., 2011). Those two parts were selected in the same way and merged into a single representative sample of the Brazilian population after proper weighting. Within the normal sample, the response rate was 66.4%; of the 3800 potential subjects identified in the initial random selection, 1278 could not be contacted. The total sample therefore comprised 3007 subjects: 2522 from the regular sample and 485 from the adolescent oversample. The response rate for the oversample was approximately the same, but cannot be calculated exactly, because for some of the non-response households the list of residents did not include resident ages to indicate if there were eligible adolescents for the survey.

The interviews were conducted face-to-face, by trained interviewers, and lasted an average of 50 min. A pilot study was conducted to detect difficulties and specific needs for additional interview training. One hundred and fifty interviewers were trained; a post-hoc analysis was performed comparing the interview data between interviewers – no interviewer bias was identified. In addition, roughly 5% of the interviewees ( $n=150$ ) were re-assessed to determine whether the interviews had been conducted appropriately.

The gambling section of the survey began with the Lie/Bet Questionnaire (LBQ), a two-item screening tool for pathological gambling (Johnson et al., 1998; Götestam et al., 2004), based on DSM-IV criteria 3 and 7 (American Psychiatric Association, 1994): “Have you ever felt the need to bet more and more money?”; and “Have you ever had to lie to people important to you about how much you gambled?” An affirmative response to either of those questions indicates probable problem gambling, with a reported sensitivity and specificity of 99% and 91%, respectively. Of the 3007 subjects in the final sample, 118 tested positive on the LBQ and were therefore considered at-risk gamblers. Only those 118 individuals were submitted to parts 2 and 3 of the gambling interview, which investigate gambling behavior and DSM-IV lifetime diagnostic criteria for pathological gambling. Given that other addiction related behaviors were investigated simultaneously, we opted not to submit all 3007 subjects to parts 2 and 3 of the gambling interview and to focus rather on the subset of at-risk gamblers, i.e., those who had been substantially involved with gambling over their lifetimes, which could have, at some point, led to pathological gambling.

The study was approved by the Research Ethics Committee of the Federal University of São Paulo, located in the city of São Paulo, Brazil.

### 2.2. Scales and variables

#### 2.2.1. Demographic variables

The variables investigated were gender, age, education level, “currently studying”, ethnicity, marital status, employment status, household monthly income, region of birth, region of residence, and religious affiliation.

#### 2.2.2. Gambling variables

Part 2 of the gambling section comprised questions adapted from a questionnaire previously devised to investigate gambling progression, addressing the age at onset of regular gambling, age at first experiencing a gambling-related problem, preferred game and types of gambling-related problems (Tavares et al., 2003). Regular gambling was defined as gambling once a month for at least 2 months in a row. This timeframe was established to avoid overestimation of early-onset status by excluding reports of occasional gambling. The current preferred game was determined by asking subjects on which game they had been spending most of their money and was classified as follows: non-commercially structured games, divided into card games and clandestine lotteries (casinos are outlawed in Brazil; at the time of the survey, gambling via card games most often occurred informally at bars and clandestine venues); state lotteries (including sports lotteries); new games (electronic gambling), other games; and none (stopped gambling). Previous studies, evaluating clinical samples, have indicated that recollection of past-preferred games based on financial expenditure was not reliable because monetary inflation required several currency changes in the past. Hence, past-preferred game was identified as the game most frequently played at gambling onset. The first gambling-related problem was defined as the first serious difficulty directly caused by gambling, classified as a family problem, a financial problem or other. The time to gambling progression (calculated only for pathological gamblers) was estimated by subtracting the age at onset of regular gambling from the age at which the first gambling-related problem occurred.

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