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A French adaptation of the Gambling-Related Cognitions Scale (GRCS): a useful tool for assessment of irrational thoughts among gamblers

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Abstract

Irrational thinking might be central in the maintenance of pathological gambling and should therefore be assessed, as other gambling-related cognitions (GRC), before treatment, especially when cognitive-behavioural therapy is proposed. Assessment tools investigating GRC exist but none are in French. Raylu and Oei have developed the Gambling-Related Cognitions Scale (GRCS), consisting of 23 items and a five-factor model. We aimed to determine if the French version of the GRCS had psychometric properties similar to those of the original version. Three hundred seventy-nine undergraduate students and 13 problem/pathological gamblers seeking treatment at the University Hospital of Nantes completed the GRCS. Confirmatory factor analysis, exploratory factor analysis, and multitrait analysis were performed. The French adaptation of the GRCS is a useful instrument for assessing GRC in order to appreciate the severity of pathological gambling, and it has the potential capacity to measure the treatment effect. Other studies are required to confirm test–retest reliability and sensitivity to change.

Résumé

La pensée irrationnelle est susceptible de jouer un rôle central dans la persistance des problèmes de jeu pathologique, c'est pourquoi elle devrait, tout comme les

autres processus cognitifs liés au jeu, faire l'objet d'une évaluation avant tout traitement, plus particulièrement lorsque le traitement proposé consiste en une thérapie cognitivo-comportementale. Il existe des outils d'évaluation des processus cognitifs liés au jeu, mais il n'y en a aucun en version française. Raylu et Oei ont élaboré la Gambling-Related Cognitions Scale (GRCS), une échelle d'évaluation des processus cognitifs liés au jeu comprenant 23 questions et reposant sur un modèle à cinq facteurs. Notre objectif est de déterminer si la version française de la GRCS possède les mêmes propriétés psychométriques que la version originale. Nous avons demandé de remplir le questionnaire de la GRCS à 379 étudiants de premier cycle et à 13 personnes ayant un problème de jeu ou de jeu pathologique venues suivre un traitement au Centre hospitalier universitaire de Nantes. Les résultats ont été soumis à une analyse factorielle confirmatoire, à une analyse factorielle exploratoire et à une analyse multicritère. Selon ces analyses, l'adaptation française de la GRCS est un outil efficace pour l'évaluation des processus cognitifs liés au jeu et l'appréciation de la gravité d'un problème de jeu pathologique. Également, elle présente potentiellement la capacité de mesurer les effets d'un traitement. D'autres études sont cependant nécessaires pour confirmer sa fiabilité de test-retest et sa sensibilité au changement.

Introduction

Although the history of gambling in France goes back a long way, it is only in the 20th century that it became widespread. Over the years, the range of games available has increased, as has access to them. This is in line with the shift in other European countries and explains why increasing numbers of French people gamble and that overall the stakes have increased considerably (Expertise-Collective, 2008; Welte, Wieczorek, Barnes, Tidwell, & Hoffman, 2004). French gamblers display characteristics that are sensibly identical to those of the broader population, and gamblers are found in all age brackets, socioprofessional categories, and both genders. Studies on ethnic minorities are banned in France on ethical grounds, unlike in other countries, where it has been shown that belonging to a racial or cultural group is a factor that favours both the practice of gambling and the development of gambling problems (Raylu & Oei, 2004a).

Pathological gambling is defined as “persistent and recurrent maladaptive gambling behaviour” that the gambler is unable to control (APA, 1994). Although gambling is a harmless leisure activity for most people, for some it can become problematic. International studies estimate that around 0.2–3% of the population suffers from this disorder (Ladouceur, Jacques, Chevalier, Sevigny, & Hamel, 2005; Petry, Stinson, & Grant, 2005). Recently, the first study on the prevalence of gambling problems in France was carried out. Without waiting for the results,

France, like most Western countries, implemented a “responsible gambling” policy, with the aim of preventing gambling problems.

Many theoretical models of pathological gambling have been developed (for review, see Blaszczynski & Nower, 2002). While each of these is conceptually interesting, they fail to explain the heterogeneity of pathological gambling. It seems important to think of it as a complex, multifactorial disorder, one that depends on both individual and environmental characteristics and that involves predisposing, starting, persistence, and relapse factors. An integrative approach has been put forward, taking both clinical and biological inter-individual differences into consideration (Blaszczynski & Nower, 2002). Three pathways are described, with additional vulnerabilities, corresponding to three subgroups of pathological gamblers: behaviourally conditioned, emotionally vulnerable, and antisocial impulsivist. The starting point, in addition to environmental factors, is a classical and operant conditioning. Irrational thoughts are inevitably amplified over time and contribute to the persistence of gambling problems. These gambling-related cognitions (GRC) reflect the failure to understand or take into account the random and uncontrollable nature of chance (Ladouceur, 2004). The main GRCs involved are the illusion of control, a greater expectancy of success than the actual probability, and omission or denial of the independence of events (Ladouceur & Walker, 1998; Langer, 1975; Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997; Walker, 1992). Although the majority of gamblers experience GRC, especially during a gambling session (Gaboury & Ladouceur, 1989), pathological gamblers seem to have more GRCs and to be more convinced of the truth of their perceptions than the nonproblem gamblers (Ladouceur, 2004). They continue to gamble because they are convinced that they will eventually win. This conviction is revealed through chasing, one of the main diagnostic criteria for DSM-IV pathological gambling (APA, 1994). Higher levels of GRC are correlated with increased frequency of gambling, gambling problems, and negative psychological states (Breen & Zuckerman, 1999; Raylu & Oei, 2004b).

Treatment implications are based on the pathway model of pathological gambling (Blaszczynski & Nower, 2002). Approaches to clinical intervention differ according to the subgroup of gamblers, the form the therapy should take (counselling, minimal intervention, psychodynamic therapy, behavioural ± cognitive therapy), and what its content should be (imaginal desensitization, exposure and response prevention, cognitive restructuring, psychotherapeutic strategies designed to enhance coping skills, problem solving, or impulse control) (Toneatto & Millar, 2004). Cognitive-behavioural therapies (CBT) have a predominant position in the clinical management of pathological gamblers over the last two decades. Coded, evaluated, and effective therapeutic methods stem from behavioural and cognitive theories of pathological gambling (Breen, Kruedelbach, & Walker, 2001; Ladouceur, *et al.*, 2001; Petry, *et al.*, 2006). CBT are based on restructuring, which

aims to help individuals recognize the dysfunctional character of their thoughts and to modify them with the aim of giving up gambling or at least reducing the irrational hope of winning and chasing. These therapies focus on GRC and are most often centered around a relapse prevention component and sometimes a behavioural component (Toneatto & Millar, 2004). One feature of CBT is the need to assess subjects from pre- to post-treatment, with the aim of measuring its effect. Assessment is generally focused on mood and anxiety states, gambling severity, and self-recording of gambling behaviours. CBT manuals rarely refer to specific GRC assessment, even when GRCs are preferential targets of the cognitive approach. Nevertheless, assessment tools investigating GRC do exist (Breen & Zuckerman, 1999; Jefferson & Nicki, 2003; Raylu & Oei, 2004b; Steenbergh, Meyers, May, & Whelan, 2002; Zimbardo & Boyd, 1999). Some have also demonstrated predictive validity (higher levels of GRC can predict gambling problems) (Breen & Zuckerman, 1999; Raylu & Oei, 2004b). One of them seemed to have good sensitivity to change (Breen, Kruedelbach, & Walker, 2001). To date, none of these assessment tools has been translated into and validated in French. Given the link between GRC and pathological gambling and the appeal of the cognitive approach, the availability of a French validated self-report questionnaire for investigating GRC is a necessary preliminary step toward any research on GRC or on the efficacy of CBT in this area. The Gambling-Related Cognitions Scale (GRCS) (Raylu & Oei, 2004b), one of the most recently developed tools, appears to be particularly well suited on account of its multidimensional structure. The aim of the authors was to develop a questionnaire that can help screen for those individuals in the community that may be at risk of developing gambling problems. Its psychometric properties are described in the “Materials and methods” section. The original validation study was carried out in Australia. The games practised in Australia are almost the same as those practised in France, and have widespread access. The Australian society is a patchwork of numerous cultures and ethnicities, each founded on their own beliefs and values. France also has for many years welcomed immigrants from different parts of the world. In this sense, both countries contain a degree of diversity, with widespread practice of the same types of game. Our hypothesis is that use of the GRCS can be extended to the French population, transcending some sociocultural differences that are probable but which cannot readily be evaluated. Thus, the first aim of the present study was to explore the psychometric properties of a French adaptation of the GRCS scale and to confirm that they are consistent with those of the original study (Raylu & Oei, 2004b). Another aim was to replicate the original study and to compare GRCS scores in various groups of gamblers according to the severity of the gambling problems and according to gender.

Materials and methods

Participants

For the Raylu and Oei study, 379 students (Faculty of Sciences, Faculty of Medicine, and Faculty of Pharmacy) were asked to participate in the study regardless of their gambling frequency. The study was proposed orally during lectures by one of the authors of the paper. The French version of the GRCS was also applied to 47 problem/probable pathological gamblers seeking treatment in a specialized ambulatory care centre. All the participants were French people living in the region of Pays de la Loire. The anonymity of the participants was guaranteed. They were not reimbursed for their participation.

Instruments

The questionnaires were distributed at the same time: either a paper questionnaire (138 individuals: 32%) or a web questionnaire (288 individuals: 68%), depending on the way the participants were recruited. To help increase the participation rate, the participants had the choice of completing a pen-and-paper questionnaire immediately or a web questionnaire later.

Few questions about gender, age, frequency of gambling in the past year, and favourite type of game were asked at the beginning of the assessment. We did not ask any further questions of the students to avoid increasing the time spent to complete the questionnaire, again with the aim of increasing the participation rate. More detail on sociodemographic and gambling characteristics was asked of the clinical group.

Each of the participants completed the following assessments:

The South Oaks Gambling Scale (SOGS) (Lesieur & Blume, 1987) is a 20-item self-report questionnaire based on DSM-III criteria for pathological gambling (APA, 1980). Using the scoring suggested by the authors, the SOGS successfully distinguishes three categories of gamblers: nonproblem (score ≤ 2), problem (score of 3 or 4), and probable pathological gamblers (score≥5).

The Gambling-Related Cognitions Scale (GRCS) (Raylu & Oei, 2004b), in its first version, consisted of 59 items and assessed various classical categories of GRC (cf. above) and other categories that are less specific but also relevant. The latter are common to other addictions, reflecting gambling-related expectancies and a perceived inability to stop gambling. Following assessment of clarity and relevance for each item, a 53-item GRCS was drawn up by the two authors and two other independent evaluators and tested on volunteers (community-based population and students). Exploratory factor analysis (EFA) followed by a varimax rotation was used to determine the structure of the final questionnaire. This resulted in a shorter version of the GRCS, consisting of only 23 items. It is a self-rated questionnaire that asks respondents to agree or disagree with several statements using a 7-point Likert scale. Analyses of the 23-item GRCS were

conducted. EFA indicated five factors: IB, interpretative bias; IC, illusion of control; PC, predictive control; GE, gambling-related expectancies; and IS, perceived inability to stop gambling (see Appendix). These accounted for 70% of the total variance. Confirmatory factor analysis (CFA) confirmed that the five-factor solution fit the data most effectively. Cronbach's alpha coefficient for the factors ranged from 0.77 to 0.91 and was 0.93 for the overall scale. Concerning the concurrent validity, the total score correlated significantly with anxiety, depression, gambling behaviour, and motivations toward gambling. With respect to the criterion-related validity, participants were divided into two groups based on their scores on the SOGS (0 or ≥4). There was a significant difference between the groups in regard to their total score and their subscale scores. Males had higher GRCS scores than females, excluding the GRCS-IC score (Raylu & Oei, 2004b).

GRCS French version: The French version of the GRCS comprised the 23 items proposed by Raylu and Oei translated into French. A French-English bilingual professional translator translated it back into English, and then the two English versions (original and back-translated) were compared. For more validity, two French-English bilingual colleagues, experts in the treatment of and research on gambling problems, gave their opinions about the French version and suggested some adjustments: a reformulation of the instructions and of the introduction of the definition of a gambling game. The French version of the GRCS is given in the Appendix.

Statistical analysis

Data were analysed by a CFA (Schumacker & Lomax, 2004) with the expected structure based on the structure retained in the English version of the questionnaire. The goodness of fit was tested with the χ^2 test (a nonsignificant value corresponds to an acceptable fit). However, the χ^2 test is known to increase with sample size, and it is common to obtain a significant χ^2 when performing CFA on self-report questionnaires. As a consequence, other fit indexes were used (Hu & Bentler, 1999): the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR), with values <0.05 interpreted as a good fit and values <0.08 as a correct fit; and the Goodness of Fit Index (GFI), the Comparative Fit Index (CFI), and the Normed Fit Index (NFI), with values >0.9 interpreted as good.

A multitrait analysis (Fayers & Machin, 2007) was conducted. We computed the correlation coefficient between each item and the score of each dimension (for the dimension to which the item belongs we used the rest score, i.e., the score computed without the item). The convergent validity is considered respected if all the correlations between each item and the dimension to which the item belongs is greater than 0.4, and the divergent validity is considered respected if each item is

more correlated to each dimension of its own than to the dimensions of others. The correlation coefficients between the obtained scores and the total score were then computed.

For each dimension of the selected structure, Cronbach's alpha (Cronbach, 1951) and Loevinger's H coefficients (Sijtsma & Molenaar, 2002) were computed. Cronbach's alpha measures the internal consistency of the dimension and Loevinger's H measures the scalability of the scale. A Cronbach alpha >0.7 is considered an acceptable value (Fayers & Machin, 2007; Nunnally, 1978) and a Loevinger H>0.3 is a correct scalability, H>0.4 is a good scalability, and H>0.5 a strong scalability.

In order to evaluate the discriminating validity of the obtained scores, participants were assigned to four categories according to the frequency of their gambling and the severity of their gambling disorder (SOGS score). Group 1 consisted of students who had no gambling disorder (SOGS<3) but who gambled occasionally (less than one time a month). Group 2 consisted of students who had no gambling disorder (SOGS<3) but who gambled regularly (at least once a month). Group 3 consisted of students who suffered from a gambling disorder (SOGS≥3). Group 4 (clinical group) consisted of problem/probable pathological gamblers seeking treatment (SOGS≥3). The mean scores and standard errors were computed for each category and compared by analysis of variance (ANOVA).

As in the Raylu and Oei paper, the mean scores and standard deviations were computed by gender and by dividing the sample into two groups (SOGS<3 and SOGS≥3) and comparing them using ANOVA.

A multitrait analysis was used to explore the links between the SOGS score and the GRCS total and subscales scores.

Insofar as the participants without a gambling disorder were mostly females and the participants with a gambling disorder were mostly males, we wanted to investigate the interaction between gender and SOGS scores. A multivariate ANOVA was conducted including a gender effect, a SOGS effect (<3 or ≥3), and an interaction. A significant result for the parameter associated with this interaction can be interpreted as a gender effect different for the two groups defined by the SOGS and *vice versa*.

The missing values of the GRCS items were imputed by following the classical rules only if less than 50% of the 23 items were missing for an individual; the imputation was realized by a personal mean score, which consists of imputing the mean values of the answered items of the individual (Fayers & Machin, 2007).

Statistical analyses were performed using SAS 9.1 and Stata 11.

Results

Description of the groups

The sample of students was 36.4% male. The ages of the participants ranged from 18 to 41 years (mean=20.9, standard deviation [SD]=2.5, median=20). More than half (*N*=202) were able to determine their favourite type of game: most students (95%) had a preference for the "pure chance games" (scratch cards, lottery games, slot machines) and only a minority made bets on sports and horseracing (5%).

The sample of patients was 85.1% male. The ages of the participants ranged from 19 to 55 years (mean=42.3, SD=12.3, median=42). The data related to their sociodemographic and gambling characteristics are given in Table 1.

The responses of the participants were compiled (*N*=426). Among those, 411 (96%) responded to all 23 items, 11 (3%) had one missing answer, and 4 (1%) had between 2 and 20 missing answers. After imputation of the missing data, the scores were computed for all the individuals except one who had 20 missing answers. The overall response rate was 93% for the SOGS. After imputation, 98.6% of the SOGS score could be computed. The SOGS scores identified 11.3% of participants (3 students and 45 patients) as "probable pathological gamblers," 2.8% (10 students and 2 patients) as "problem gamblers," and 85.9% (366 students) as "nonproblem gamblers."

Confirmatory factor analysis

The results of the CFA about the expected structure are given in Table 2. The SRMR and the RMSEA were less than 0.08, which signifies a correct fit. CFI and NFI were 0.93 and 0.97, respectively, which represents a good fit, whereas GFI was just under 0.9, which is the threshold generally used to interpret the fit as good. Globally, the fit of the expected structure could be interpreted as correct.

Convergent validity and divergent validity

As seen in Table 3, all items except item 23 ("If I keep changing my numbers, I have less chance of winning than if I keep the same numbers every time") were moderately or strongly correlated with their own dimension (>0.4). Globally, the questionnaire has a good convergent validity. Nevertheless, we detected five items that were more correlated with other scores than the score of their own dimension: items 4, 9, 11, 14, and 22. Item 11 ("Gambling makes the future brighter") is attached to the GE and is correlated to its dimension with a correlation similar to the scores IS and IC. Items 4 ("Losses when gambling are bound to be followed by a series of wins"), 9 ("A series of losses will provide me with a learning experience that will help me win later"), 14 ("When I have a win once, I will definitely win again"), and 22 ("I have some control over predicting my gambling wins") are

attached to the PC dimension and are more strongly correlated to the score IB. Items 9 and 22 are more correlated to the scores IC and GE.

The correlation coefficients between the five subscale scores were between 0.61 and 0.73, showing positive links between the five dimensions. Furthermore, all five subscales scores were very correlated to the total score (coefficients between 0.81 and 0.87).

Internal consistency and scalability

Values of Cronbach's alpha and of Loevinger's coefficients for each dimension of the GRCS are presented in Table 4. All the subscales presented a correct internal consistency (Cronbach's alpha >0.7) and a correct scalability (H>0.3). Concerning the internal consistency, the results are coherent with the values of Raylu and Oei (2004).

Discriminating validity

Means and standard deviations of the scores are displayed in Table 5 by category of respondents. We highlighted differences between the two groups of students with no gambling disorder according to their gambling frequencies: Compared to the students who gambled occasionally, the students who gambled regularly had a higher score for the GE, PC, and IB subscales. We also demonstrated some differences between the two groups of participants who had a gambling disorder: Compared to the rest of the students, the problem/probable pathological gamblers seeking treatment had a higher score for the IS subscale. Means and standard deviations of the GRCS subscales and total scores for each of the SOGS groups (<3 and ≥3) are also given in the Table 5. There was a significant difference between the two groups with respect to the score for each subscale and the total score. As seen in Table 5, all the scores, with the exception of the GRCS-IC subscale, had significant differences between males and females.

Concurrent validity

We found a significant correlation between the SOGS score and the GRCS total and subscales scores, even if the correlation coefficient sometimes was low (between 0.21 and 0.64). The highest correlation coefficient (0.64) was between the SOGS score and the GRCS-IS score and the lower (0.21) was between the SOGS score and the GRCS-IC score.

Gender×SOGS interaction score

Results of the multivariate ANOVA are given in Table 6. In these results, the constants can be interpreted as the mean scores (in each subscale) for the reference group (males with SOGS<3). Gender parameters can be interpreted as

the differences of the means between males and females in the reference group for the SOGS (<3), and the SOGS parameters can be interpreted as the differences between the two groups (SOGS<3 or ≥3) for the reference group for the gender (males). The interactions allowed testing if these differences of means were different in the others groups.

No interaction was significant, showing independence of the gender and SOGS effects. Consequently, we can assume that the overrepresentation of females among the participants who had no gambling disorder and the overrepresentation of males among the participants who had a gambling disorder do not cause major bias.

Discussion

The psychometric properties of a French adaptation of the GRCS (Raylu & Oei, 2004b) were analysed, knowing that the original structure of this instrument has been confirmed. The fitness of this structure is correct (RMSEA<0.08, RMR<0.08, CFI>0.9, NFI>0.9, and GFI ~ 0.9), and the dimensions obtained have good internal consistency (Cronbach's alpha >0.7) and correct scalability (Loevinger's H>0.3). All dimensions have good convergent validity. However, items 4, 9, 14, and 22 are well represented on both the PC (to which they belong) and IB dimensions, which indicates links between the two dimensions and that these items are not clearly associated to one or the other. All dimensions have correct divergent validity.

Above all, good discriminating validity of the French adaptation of the questionnaire was demonstrated. The GRCS total score and the GRCS subscales scores allow differentiating categories of gamblers or distinguishing nonproblem gamblers from problem/probable pathological gamblers. This confirms that GRC and gambling disorder are closely associated, but also that the level of GRC changes according to gambling frequency, even if there is no gambling problem. In particular, the GRCS-GE, GRCS-PC, and GRCS-IB scores have the ability to discriminate between nonproblem gamblers according to gambling frequency. Only the GRCS-IS scores seem to differentiate the students who have a gambling disorder and the problem/probable pathological gamblers seeking treatment. We can assume that the problem/probable pathological gamblers seek help when they become aware of their inability to stop gambling. Furthermore, this dimension covers failure to control the behaviour, a major characteristic of the addictive process (Goodman, 2008). It is also the dimension with the greatest correlation to the severity of the gambling problem evaluated by the SOGS. Similar to the Raylu and Oei results, the scores obtained by males and females were different among all dimensions except for IC.

The French adaptation of the GRCS was verified to have good psychometric

properties, with minor differences from the original version that potentially can be explained by the complex formulation of some items (in particular, item 23, which was the last question, and the subjects' attention was waning).

The French adaptation study was conducted on a sample of students and to a certain extent on patients. The sample was relatively similar to that of Raylu and Oei (2004b). It is important to note that their aim was to “develop and validate a measure to screen for a range of gambling-related cognitions in gamblers” drawn from a community-based population. The added value of our study was that it tested the psychometric properties of the French version of the GRCS in a sample of problem/probable pathological gamblers. We confirmed the usefulness of this tool for screening the broader population to identify those who are likely to have gambling problems.

The French version of the GRCS is useful to therapists insofar as the five dimensions of the original tool are found, because it makes it possible to differentiate the GRC in each patient with a variable degree of conviction. Psychotherapeutic interventions can thus be targeted specifically toward cognitive restructuring.

These results must be viewed in the context of several limitations. First, a possible bias may lie in the fact that slot machines are very widespread in Australia (e.g., hotels and bars), while in France they are allowed only in casinos. There may well be GRCs that are specific to this type of game. The difference between the two countries is offset by the fact that our study was carried out in a region that is particularly well endowed with casinos, so slot machines are very widely available. Second, the question is whether the French adaptation of the GRCS can be used in other French-speaking countries. All the participants were French people. France is a relatively small country compared to Australia, Canada, or the USA. There are no really marked disparities of language from one region to another. We are sure that the findings of this study can be generalised to the whole of the hexagon. Moreover, one of the experts in the treatment of and research on gambling problems who gave his opinion about the French version is a Canadian psychologist, who lives in Montreal and is French-English bilingual. He proposed some adjustments to the French version so it will be understandable in Canada and faithful to the original version. We can legitimately assume that the questionnaire can be used in Canada. Third, the sample size of the clinical group was relatively small, but it also reflected the difficulty in recruiting problem/probable pathological gamblers seeking treatment. It is indeed estimated that only 3–11% of problem/probable pathological gamblers seek treatment (Sullivan, McCormick, Lamont, & Penfold, 2007). Finally, this study included participants who could complete a pen-and-paper questionnaire or respond on a website. Among the sample, there was no significant difference (at 5%) in the mean of the five scores

and of the total score between these two kinds of questionnaire. We note that the two versions of the questionnaire (paper and website) were strictly identical.

In the future, we aim to study the test-retest reliability and sensitivity to change of the French version of GRCS. A significant decrease in the GRCS score at the end of CBT (with the idea that cognitive restructuring is efficient) would show its ability to detect the impact of treatment. Another potential area of research is the distinction between the subjects' favourite game (slot machine, sport pools, poker) based on specific GRC, and analyse whether the GRCS is relevant or not in all forms of pathological gamblers.

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Appendix: French adaptation of GRCS

Echelle des cognitions liées au jeu

Pour les questions 1 à 23, merci de noircir le cercle approprié pour décrire à quel point vous êtes d'accord avec la proposition indiquée à chaque ligne.

NB : par jeu, on entend les jeux de hasard et d'argent, tels que les jeux de cartes, de dés, les machines à sous, ou tous les types de jeux pour lesquels vous misez de l'argent ou faites des paris.

Vous ne devez choisir qu'une seule réponse et vous avez le choix entre les propositions suivantes :

(Désaccord total=1; Désaccord fort=2; Désaccord moven=3; Ni accord, ni désaccord =4; Accord moven=5; Accord fort=6; Accord total=7)

Scoring

To obtain the raw subscale scores, add values of items for each subscale. To obtain total raw GRCS score, add the five raw subscale scores. To obtain mean subscale scores, divide each of the raw subscale scores by the number of items of each subscale. To obtain a total mean GRCS score, add the five means subscale scores. The items that belong to each subscale are:

- **Gambling expectancies** (GE) (relates to individual's perceived expectations about the effects of gambling): 1, 6, 11, 16
- **Illusion of control** (IC) (reflects a belief that one could control gambling outcomes via personal skill, ability, or knowledge): 3, 8, 13, 18
- **Predictive control** (PC) (reflects means by which an individual could predict gambling outcomes): 4, 9, 14, 19, 22, 23
- **Inability to stop gambling** (IS) (relates to one's perceived ability to resist gambling in high-risk situations): 2, 7, 12, 17, 21
- **Interpretative bias** (IB) (consists of reframing gambling outcomes that would encourage continued gambling despite losses): 5, 10, 15, 20

Tables

Table 1

Sociodemographic and gambling characteristics of the problem/probable pathological gamblers seeking treatment (N=47)

	Mean (SD) or percentage
Sociodemographic characteristics	
Gender	
Males	85.1%
Females	14.9%
Age (years)	42.3 (2.3)
Marital status	
Single, divorced, widowed	38.3%
Married, living common law	61.7%
Educational level	
Not a high school graduate	53.2%
High school graduate	46.8%
Professional status	
Worker, employee	76.6%
Executive, professional	23.4%
Working status	
Working	55.3%
Unemployed, retired, disabled, on sick leave	44.7%
Gambling characteristics	
Severity of the gambling disorder (categorical approach)	
Problem gamblers (SOGS score=3 or 4)	4.3%
Probable pathological gamblers (SOGS score≥5)	95.7%
Severity of the gambling disorder (dimensional approach)	
SOGS score (/20)	10.2 (3.4)
Favourite type of game	
Pure chance games[a]	44.7%
Chance games with quasi-skill[b]	48.9%
Chance games with elements of skill[c]	6.4%
Usual medium of game	
Offline	68.1%
Online	31.9%
Gambling trajectory (years)	
Age at gambling first experience	19.4 (10.2)
Age at onset of regular gambling	23.8 (10.1)
Age at onset of the gambling disorder	35.7 (13.0)
Age at onset of specific care	41.7 (12.1)
Duration of the first stage	4.4 (5.6)
Duration of the second stage	11.7 (11.0)
Duration of the third stage	5.6 (5.6)

[a] Pure chance games=scratch cards, lottery games, slot machines
[b] Chance games with quasi-skill=sports and horseracing bets, black jack
[c] Chance games with elements of skill=poker

Table 2

Results of the CFA on the expected structure of the questionnaire

	Expected structure	Original version[a]
χ^2 (p value)	633.79 (220 df, $p<0.001$)	–
RMSEA	0.068	0.06
SRMR	0.051	0.07
CFI	0.98	0.92
GFI	0.88	
NFI	0.97	

[a] Raylu & Oei, 2004b

Table 3

Multitrait analysis: values are the correlation coefficients between the responses to each item and the score (or the rest score for the dimension of the item) computed in each dimension

	Items	Gambling-related expectancies	Incapacity to stop gambling	Illusion of control	Predictive control	Interpretation bias
Gambling related expectancies	6	0.636	0.540	0.524	0.572	0.585
	11	0.599	0.614	0.605	0.550	0.585
	1	0.569	0.470	0.386	0.425	0.525
	16	0.544	0.465	0.397	0.432	0.445
Incapacity to stop gambling	12	0.588	0.833	0.559	0.556	0.606
	17	0.529	0.763	0.499	0.497	0.527
	7	0.539	0.721	0.532	0.534	0.553
	21	0.499	0.656	0.497	0.482	0.425
	2	0.587	0.627	0.446	0.433	0.477
Illusion of control	13	0.501	0.558	0.763	0.602	0.539
	18	0.470	0.515	0.697	0.565	0.552
	3	0.573	0.630	0.648	0.570	0.533
	8	0.477	0.384	0.632	0.562	0.524
Predictive control	4	0.481	0.504	0.573	0.584	0.549
	14	0.552	0.531	0.513	0.558	0.627
	22	0.519	0.549	0.562	0.513	0.533
	9	0.507	0.476	0.505	0.493	0.641
	19	0.267	0.280	0.390	0.446	0.358
	23	0.270	0.188	0.303	0.388	0.274
Interpretative bias	5	0.546	0.453	0.487	0.574	0.639
	10	0.500	0.566	0.594	0.588	0.617
	15	0.569	0.463	0.471	0.558	0.616
	20	0.551	0.528	0.511	0.588	0.613

Table 4

Cronbach's alpha and Loevinger's H coefficients

	Cronbach's alpha	Cronbach's alpha Original version[a]	Loevinger's H
Gambling-related expectancies	0.79	0.87	0.537
Incapacity to stop gambling	0.90	0.89	0.686
Illusion of control	0.84	0.87	0.598
Predictive control	0.75	0.77	0.349
Interpretative bias	0.80	0.91	0.522
Total	0.94	0.93	0.438

[a] Raylu & Oei, 2004b

Table 5

Mean (and standard deviation) of the scores by category of respondents, by gender, and by SOGS score

	Gambling-related expectancies (/28)	Incapacity to stop gambling (/35)	Illusion of control (/28)	Predictive control (/42)	Interpretative bias (/28)	Total (/161)
General mean (n=426)	9.30 (5.09)	8.91 (6.59)	6.60 (4.36)	13.96 (6.87)	9.31 (5.45)	48.08 (23.99)
Group 1 (n=285)	8.31 (4.56)	7.23 (4.84)	6.24 (4.09)	12.82 (6.64)	8.12 (4.89)	42.71 (21.77)
Group 2 (n=78)	9.82 (4.70)	7.45 (3.51)	6.53 (3.97)	14.63 (5.63)	9.71 (4.63)	48.13 (16.89)
Comparison of groups 1 and 2 (p values)	0.014	0.730	0.604	0.033	0.013	0.051
Group 3 (n=13)	11.23 (6.71)	12.31 (7.23)	8.54 (6.91)	18.31 (8.53)	14.92 (6.90)	65.31 (30.72)
Group 4 (n=47)	14.02 (5.53)	20.77 (7.35)	8.28 (5.26)	18.47 (7.36)	14.13 (5.68)	75.66 (24.59)
Comparison of groups 3 and 4 (p values)	0.063	<0.0001	0.847	0.938	0.613	0.127
Comparison of the 4 groups (p values)	<0.0001	<0.0001	0.0048	<0.0001	<0.0001	<0.0001
Males (n=176)	10.77 (5.62)	11.23 (7.93)	6.98 (5.01)	15.35 (7.33)	11.02 (5.90)	55.35 (26.85)
Females (n=245)	8.27 (4.41)	7.31 (4.88)	6.31 (3.82)	12.95 (6.37)	8.02 (4.70)	42.80 (20.34)
Student's t-test (p value)	<0.0001	<0.0001	0.1179	0.0004	<0.0001	<0.0001
SOGS <3 (n=362)	8.58 (4.51)	7.20 (4.35)	6.24 (3.90)	13.14 (6.33)	8.40 (4.77)	43.56 (20.04)
SOGS ≥3 (n=60)	13.42 (5.86)	18.93 (8.07)	8.33 (5.60)	18.43 (7.55)	14.30 (5.91)	73.42 (26.11)
Student's t-test (p value)	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001

Group 1: students having no gambling disorder (SOGS<3) and who gambled occasionally (less than one time a month).
Group 2: students having no gambling disorder (SOGS<3) and who gambled regularly (at least once a month).
Group 3: students having a gambling disorder (SOGS≥3).
Group 4 (clinical group): problem/probable pathological gamblers seeking treatment (SOGS≥3).

Table 6

Multivariate ANOVA according to gender and SOGS score

	Gambling-related expectancies (/28)	Incapacity to stop gambling (/35)	Illusion of control (/28)	Predictive control (/42)	Interpretative bias (/28)	Total (/161)
Constant (males, SOGS<3)	9.61	8.09	6.24	14.03	9.60	47.76
SOGS≥3	4.07 (<0.001)	11.07 (<0.001)	2.09 (<0.001)	4.63 (<0.001)	5.01 (<0.001)	26.73 (<0.001)
Females	−1.58 (0.002)	−1.35 (0.011)	NS	−1.36 (0.048)	−1.86 (<0.001)	−6.42 (0.004)
Females × SOGS≥3	NS	NS	NS	NS	NS	NS
R^2	0.135	0.408	0.030	0.084	0.175	0.215

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Jouer me rend plus heureux.	○	○	○	○	○	○	○
2. Je ne peux pas fonctionner sans jouer.	○	○	○	○	○	○	○
3. Prier m'aide à gagner.	○	○	○	○	○	○	○
4. Les pertes au jeu doivent être suivies par une série de gains.	○	○	○	○	○	○	○
5. Relier mes gains à mon adresse et mes capacités me fait continuer à jouer.	○	○	○	○	○	○	○
6. Jouer améliore l'apparence des choses.	○	○	○	○	○	○	○
7. Il m'est difficile d'arrêter de jouer étant donner que je perds le contrôle.	○	○	○	○	○	○	○
8. Des nombres ou des couleurs particulières peuvent aider à augmenter mes chances de gagner.	○	○	○	○	○	○	○
9. Une série de pertes me procurera un apprentissage qui m'aidera à gagner par la suite.	○	○	○	○	○	○	○
10. Relier mes pertes à de la malchance ou de mauvaises circonstances me fait continuer à jouer.	○	○	○	○	○	○	○
11. Jouer rend l'avenir plus prometteur.	○	○	○	○	○	○	○
12. Mon désir de jouer est tellement plus fort que moi.	○	○	○	○	○	○	○
13. Je collectionne des objets particuliers qui aident à augmenter mes chances de gagner.	○	○	○	○	○	○	○
14. Lorsque je gagne une fois, je gagnerai sûrement encore.	○	○	○	○	○	○	○
15. Relier mes pertes aux probabilités me fait continuer à jouer.	○	○	○	○	○	○	○
16. Etre en train de jouer aide à réduire la tension et le stress.	○	○	○	○	○	○	○
17. Je ne suis pas suffisamment fort pour arrêter de jouer.	○	○	○	○	○	○	○
18. J'ai des rituels et des comportements particuliers qui augmentent mes chances de gagner.	○	○	○	○	○	○	○
19. Il y a des moments où je me sens chanceux(se) et je ne joue qu'à ces moments-là.	○	○	○	○	○	○	○
20. Me souvenir de la somme que j'ai gagnée la dernière fois me fait continuer à jouer.	○	○	○	○	○	○	○
21. Je ne serai jamais capable d'arrêter de jouer.	○	○	○	○	○	○	○
22. Je possède une certaine capacité à prédire mes gains au jeu.	○	○	○	○	○	○	○
23. Si je change tout le temps mes numéros, j'ai moins de chance de gagner que si je conserve les mêmes numéros à chaque fois.	○	○	○	○	○	○	○

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