Evaluation of the psychometric properties of the Gambling Motives Questionnaire in Argentinian young people and adults

Valoración de las propiedades psicométricas del Cuestionario de Motivos de Apuestas en jóvenes y adultos argentinos

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Abstract

The purpose of the present study was to evaluate, in a sample of young people and adults from the general community, the psychometric properties of two models developed for assessing gambling motives (Gambling Motives Questionnaire and Gambling Motives Questionnaire-Financial; GMQ and GMQ-F). Specifically, a confirmatory factor analysis was carried out to assess the fit of the two models to the data. Internal consistency of the scales was then analyzed. A multiple regression analysis was conducted to analyze the utility of gambling motives for predicting levels of gambling problem severity. The final sample was made up of 341 young people and adults, aged 18 to 60, who reported any gambling activity during the last six months. The maximum likelihood (ML) method with robust Satorra-Bentler correction was used to evaluate the fit of the models to the data. The results indicated that both the GMQ and the GMQ-F models show a reasonable fit to the data. All scales have adequate internal consistency values. Enhancement, coping and financial gambling motives were associated with greater severity of gambling problems. Overall, the results indicate that both models have adequate psychometric properties, though the GMQ-F appears to provide a more comprehensive alternative for assessing gambling motives in the general community.

Key Words: gambling motives; young people, adults, psychometric properties.

Resumen

El presente trabajo tuvo como objetivo evaluar, en una muestra de apostadores jóvenes y adultos de la comunidad general, las propiedades psicométricas de estructura y consistencia interna del Cuestionario de Motivos de Apuestas en sus dos versiones: original (GMQ) y revisada (GMQ-F). Específicamente, se efectuó un análisis factorial confirmatorio para evaluar el ajuste de ambos modelos. Luego se analizó la consistencia interna de las escalas y se analizó la utilidad de las escalas para predecir un mayor nivel de severidad en los juegos de apuestas. Participaron 341 jóvenes y adultos, con edades entre 18 y 60 años, que reportaron realizar apuestas en los últimos seis meses. Para evaluar el ajuste de los modelos propuestos se utilizó el método de estimación máxima verosimilitud (ML) con la corrección robusta de Satorra-Bentler. Los resultados indicaron que los modelos GMQ y GMQ-F presentan un ajuste razonable a los datos. Todas las escalas presentan adecuados valores de consistencia interna. Los motivos de mejora, afrontamiento y financieros se relacionan con una mayor severidad de problemas con las apuestas. En general, los resultados indican que ambos modelos cuentan con adecuadas propiedades psicométricas, sin embargo, el GMQ-F se ofrece como una alternativa más completa para la medición de los motivos de apuestas en la comunidad general.

Palabras clave: motivos de apuestas, jóvenes, adultos, propiedades psicométricas.

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In its most recent version, the Diagnostic and Statistical Manual of Mental Disorders (DSM 5; American Psychiatric Association, 2013) situates gambling-related disorders in the category of *addictions*, together with substance-abuse disorders. This new classification of pathological gambling, which in previous versions of the DSM was grouped with impulse-control disorders, is based on the existence of a range of elements common to the two types of disorder, and pathological gambling is clearly defined as a behavioural addiction (Chambers & Potenza, 2003; Clark, 2010). In the clinical medical context, both the DSM and the International Classification of Diseases (ICD) distinguish between pathological and non-pathological gambling, whilst less severe levels of compulsive gambling are not even addressed by these diagnostic classifications.

There are, however, various tools developed for detecting different levels of severity of this behaviour and thus improving our understanding of the disorder. Some of these instruments, such as the *South Oaks Gambling Screen* (SOGS; Lesieur & Blume, 1987) and the *Problem Gambling Severity Index* (PGSI; Ferris & Wynne 2001), permit us to distinguish a problematic mode of gambling that would be situated between the pathological mode and the recreational mode. Betting and gambling as recreational activities are highly prevalent in many countries and cultures (Clark, 2010; Frascella, Potenza, Brown, & Childress, 2010; Ledgerwood, Alessi, Phoenix, & Petry, 2009). The vast majority of people who gamble experience no serious problems or consequences; nevertheless, for a percentage of gamblers their behaviour develops into a disorder (French, Maclean, & Ettner, 2008; Korman, Toneatto, & Skinner, 2006).

Gambling behaviour, then, is understood in terms of a continuum that goes from recreational mode to pathological mode, including qualitative and quantitatively different stages (Hodgins, Stea, & Grant, 2011; Toce-Gerstein, Gerstein, & Volberg, 2003). Indeed, research has highlighted the importance of studying all levels of this continuum for a better understanding of recreational modes, pathological modes and all the stages in between (Dechant, 2014; Toce-Gerstein et al., 2003).

In Argentina, data from epidemiological studies in relation to the prevalence of gambling, be it in recreational, problematic or pathological mode, are scarce. There is evidence, however, that levels of gambling among Argentinian university students (Tuzinkievich, Vera, Caneto, Garimaldi, & Pilatti, 2013a; 2013b) are similar to those in countries such as the United States (Huang, Jacobs, Derevensky, Gupta, & Paskus, 2007) and Canada (Huang & Boyer, 2007; Ladouceur, Dubé, & Bujold, 1994). The studies in question reveal that approximately 60% of the university population have gambled at some time in their life, whilst between 6 and 12% meet the criteria for problem gambling.

People gamble for different reasons, with different motives (Dechant, 2014; Dechant & Ellery, 2011; Steinberg, Tremblay, Zack, Busto, & Zawertailo, 2011; Stewart & Zack, 2008). In the field of alcohol use, the motives are understood as internal or external needs that people seek to satisfy through drinking (Cooper, 1994; Cooper, Russell, Skinner,, & Windle, 1992; Hauck-Filho, Teixeira, & Cooper, 2012; Merrill & Read, 2010; Kuntsche & Kuntsche, 2009; Mazzardis, Vieno, Kuntsche, & Santinello, 2010). The *Drinking Motives Questionnaire* (DMQ; Cooper et al., 1992) postulates a structure of three factors or dimensions accounting for the principal motives for drinking alcohol: social, coping and enhancement. Recently, this theoretical model has been used as a starting point for constructing the *Gambling Motives Questionnaire* (GMQ, Stewart & Zack, 2008). Indeed, the GMQ employs the 15 items of the DMQ (Cooper et al., 1992) to investigate the frequency with which people gamble with a view to obtaining results guided by social, enhancement and coping motives. The GMQ has been used satisfactorily in various studies with samples of gamblers at different levels of severity (MacLaren, Harrigan, & Dixon, 2012; Stewart & Zack, 2008; Parhami, Siani, Campos, Rosenthal, & Fong, 2012).

These studies indicate that gamblers scoring higher on instruments for the detection of severity in gambling also score higher, compared to gamblers with moderate or low severity levels, on the three scales of the GMQ (MacLaren et al., 2012; Parhami et al., 2012; Stewart & Zack, 2008). However, not all the motives show the same prevalence. Specifically, gamblers with scores indicating potentially pathological gambling (Parhami et al., 2012) or high level of severity (MacLaren et al., 2012) appear to gamble more mainly from motives of enhancement, followed by motives of coping, and finally by social motives. Social motives for gambling, like social motives for alcohol use (Merrill & Read, 2010), do not appear to have a direct influence on the development of problematic levels of this disorder (Stewart & Zack, 2008) or on higher frequency of gambling (Dechant, 2014).

As far as the assessment of gambling motives is concerned, some researchers have suggested the need to include items that take into account motives of a financial nature (Dechant & Ellery, 2011; Lee, Chae, Lee, & Kim, 2007). From the work of Dechant and cols. (Dechant & Ellery, 2011; Dechant, 2014) there emerged the GMQ-F, which incorporates a new dimension for measuring gambling frequency in accordance with financial motives (e.g., because I enjoy thinking about what I could with my winnings). Dechant (2014) evaluated, in a sample of adults who had gambled at some time in the year prior to the study, the functioning of the GMQ incorporating items that assessed financial motives. First of all, it was found that the items *it's a way to celebrate* and *to relax* did not load in the respective factors (social and coping), and that the item because it's exciting (from the enhancement motives scale) loaded across two different dimensions. In addition, the Cronbach's alpha

coefficient improved on removing these three items from the respective scales. Once the irrelevant items had been removed, and by means of further structural and internal consistency analysis, the study's authors obtained evidence of the adequate psychometric functioning of the GMQ-F made up of 16 items grouped in four scales: social, enhancement, coping and financial. Through hierarchical regression analysis it was found that the addition of the financial scale improved the prediction of gambling frequency.

In the Argentinian context, to the best of our knowledge, no study to date has evaluated the psychometric properties of either the GMQ (Stewart & Zack, 2008) or the GMQ-F (Dechant, 2014); likewise, researchers in this field have highlighted the need to examine the functioning of these instruments in the general population (Dechant, 2014). Thus, the principal aim of the present work is to examine the psychometric properties of the Spanish language version of the GMQ-F (Dechant, 2014) and the GMQ (Stewart & Zack, 2008). We also set out to determine which scales of these models shows the best fit to the local context, and to carry out a hierarchical regression analysis to decide which of them best predicts gambling severity level in a sample of young and adult gamblers from the general community. Furthermore, and by means of an analysis of variance (ANOVA), we aim to assess the instrument's criterion validity for providing evidence about the capacity of its gambling motives scales for discriminating between participants with different levels of severity in their gambling behaviour.

Method

Participants

The sample was made up of 355 participants (29.3% men and 70.7% women) aged between 18 and 60 (M=29.09±.55). People in this age range from the general community and who reported any kind of gambling activity in the previous six months were invited to take part in the research. The invitation to participate reached potential participants via social media and e-mail. It contained a link so that they could fill out the questionnaire online. Fourteen cases were discarded because they failed to meet the inclusion criteria (e.g., they had not gambled in the last six months). Thus, the final sample included 341 participants (29.3% men and 70.7% women, with a mean age of 29.12±.57). By age subgroup, 59.8% were aged 18-27, 22.3% were aged 28-37, 8.2% were aged 38-47, and 9.7% were aged 48-60. As regards place of residence, 45.5% reported living in the province of Córdoba (though only 31.4% said they were born in that province), 40.5% lived in the province of Buenos Aires and 4.4% in Santa Fe. Place of residence of the remaining 9.6% was distributed across 13 other provinces of Argentina. Sixteen-point-four per cent (16.4%) reported working between 20 and 40 hours per week, 55.1% were university students, and 2.3% were neither working or studying.

Instruments

Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001): this tool for detecting the severity level of gambling problems is made up of nine items, of which five are associated with behavioural indicators and four with negative consequences. It presents a high correlation with the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987). The original English version of the PGSI shows adequate internal consistency values (α= .84) (Ferris & Wynne, 2001). For the present study, two judges expert in English translated the items into Spanish. These versions were revised until a consensual version was obtained, with special emphasis on linguistic and cultural aspects. After that, cognitive interviews were carried out with seven participants so as to obtain information about how well each item was understood and how appropriate it was for the local context. On the basis of these interviews the necessary modifications were made. The Spanish version used in this study showed adequate internal consistency (α= .88). According to Ferris and Wynne (2001), scores should be interpreted as follows: a score of 8 or more indicates problem gambling with negative consequences and loss of control, scores of between 3 and 7 indicate a moderate level of problems, with some negative consequences, whilst scores of between 0 and 2 indicate a low level of problems, with few negative consequences.

Gambling Motives Questionnaire (GMQ; Stewart & Zack, 2007): this version is made up of 15 items, grouped in three subscales: social, enhancement and coping, which refer to people's different motives for gambling. In addition, we employed the financial scale added to the instrument by Dechant (2014). Specifically, the model proposed by Dechant includes 16 items: twelve corresponding to the GMQ and four referring to financial motives. The GMQ-F, in contrast to the GMQ, does not include the items *it's a way to celebrate* from the social scale, because it's exciting from the enhancement scale and *to relax* from the coping scale. Participants were required to indicate, by means of a Likert-type scale with five response options (from 0 = almost never/never, to 5 = almost always/always), the frequency with which they had gambled in the last year for the reason mentioned in each item. First of all, three experts in the English language each produced their own Spanish translation of the four scales. The three versions were compared and discussed until an agreed version was obtained for each item. In this step the authors took into account the linguistic and cultural differences between the population of origin and the target population of this adapted version. With this first adapted instrument, cognitive interviews were carried out with seven people so as to identify any possible difficulties for understanding the items. Based on the results of these interviews the appropriate language adjustments were made. In this study we applied the 15 items of the GMQ (Stewart & Zack, 2007) together with the four items of the financial scale (Dechant, 2014). Previous studies, using the original English version, have reported

adequate internal consistency values for the GMQ-F (from α = .69 to α = .82) (Dechant, 2014) and for the GMQ (from α = .81 to α = .91) (Stewart & Zack, 2007).

Procedure

Prospective participants followed a link to a secure website belonging to the Survey and Questionnaire Server at the Universidad Nacional de Córdoba (Argentina). On the page for the questionnaire used in this study, the person was first asked to provide informed consent to take part. Filling out the questionnaire took approximately 30 to 40 minutes. Participants received no type of financial reward for responding to the questionnaire.

Data analysis

First of all, the behaviour of the variables was explored by means of univariate analysis, based on frequencies and percentages, in order to describe the level of gambling severity (PGSI). Subsequently, measures of central tendency (Mean) were used to describe participants' scores on each of the gambling motives scales. Furthermore, through a variance analysis, scores on each of the scales were compared between participants with different severity levels. The locus of significant differences was analyzed by means of *post hoc* analysis, using the *Tukey* statistic, and this was followed by a series of confirmatory factor analyses (AFC) with the aim of assessing the internal structure of the model proposed by the GMQ-F and of the model proposed by the GMQ. It was decided to use an AFC rather than an exploratory factor analysis since this permits us to test previous hypotheses about the factor structure of an instrument (Verdejo-García et al., 2012). The GMQ-F Model is composed of the latent factors social, enhancement, coping and financial, and 16 items (four for each scale) as observed variables and their respective measurement errors. The GMQ Model is made up of the factors social, enhancement and coping, and 15 items (five for each scale) as observed variables and their respective measurement errors.

The fit of the two models was examined and compared. For the fit analysis we used the EQS 6.1. software, and the estimation method employed was maximum likelihood (ML) with the Satorra-Bentler (S-B; Bentler, 2006; Satorra, 2002) robust correction. This method is the most appropriate for the estimation of AFC models with observed data on ordinal scales and absence of multivariate normality (Mardia coefficient ≥ 5) (Mezquita et al., 2011). For assessing the fit of the models the following indicators were used: the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA). The values used for the model's goodness of fit were as follows: for the CFI, values of between .90 and .95 or higher were considered to indicate acceptable to excellent fit for the model, and for the case of RMSEA the respective values were .05 to .08 (Hu & Bentler, 1995). Finally, we took into account the standardized factor loadings (β) of each observed variable in the latent variable (Hair, Black, Babin, Anderson, & Tatham, 2006).

Next, the Cronbach's alpha coefficients were calculated for examining the internal consistency of each sub-scale. Finally, and by means of hierarchical regression analysis, we examined the capacity of each one of the gambling motives sub-scales for predicting the severity level of problem gambling. Specifically, we evaluated separately the independent contribution of each of the three GMQ sub-scales and the four GMQ-F sub-scales (predictor variables) to problem gambling severity (PGSI) (criterion variable). The effects of sex (man = 1, woman = 2) and age were controlled. All the analyses conducted out in relation to level of problem gambling severity were carried out with the sub-sample (n = 270, 29.3% men and 70.7%, women, *M* age = 29.44±10.63) that responded to the PGSI.

Results

Descriptive: prevalence of problem gambling severity and differences in gambling motives according to severity level.

Problem gambling severity: The sample obtained a mean of 1.54±2.97 on the PGSI. Four-point-four per cent (4.4%) (n

Table 1
Mean and standard deviation for each of the scales of the two models analyzed (GMQ and GMQ-F), by severity level.

	GMQ			GMQ-F			
	Enhancement	**Coping**	**Social**	**Enhancement**	**Coping**	**Financial**	**Social**
	M(DS)	M(DS)	M(DS)	M(DS)	M(DS)	M(DS)	M(DS)
JP-CN	13.33 ± 4.89	10.25 ± 4.63	8.75 ± 4.20	10.92 ± 3.92	7.92 ± 3.94	12.16 ± 3.07	7.00 ± 3.46
PM-ACN	10.60 ± 4.29	7.05 ± 2.52	9.23 ± 3.38	8.94 ± 3.79	5.40 ± 1.99	8.80 ± 3.39	7.51 ± 2.87
PB-PCN	8.49 ± 3.29	5.95 ± 1.76	7.99 ± 2.94	7.08 ± 2.90	4.53 ± 1.30	6.72 ± 3.15	6.58 ± 2.54

GMQ: Three-factor model; GMQ-F: Four-factor model; PG-NG: problem gambling with negative consequences and loss of control (scores ≥ 8 on the PGSI); MP-SNC: moderate problem gambling with some negative consequences (scores of 3 to 7 on the PGSI); LP-FNC: low problem gambling with few negative consequences (scores of 0 to 2 on the PGSI).

= 12) of the participants obtained a score of 8 or more, which is considered an indicator of problem gambling with negative consequences and loss of control, whilst 13% (n = 35) scored between 4 and 7, placing them in the category of moderate level of problem gambling with some negative consequences, and the remaining 82.6% (n = 223) obtained scores reflecting a low level of problems with few negative consequences (≤ 2).

Differences in gambling motives according to severity level: Table 1 shows the scores (mean and standard deviation) obtained on each of the scales of the two models analyzed (GMQ and GMQ-F) by severity category (low level of problems, moderate level of problems, and problem gambling with loss of control) according to the values obtained on the PGSI.

GMQ Model: Significant differences were found for the enhancement $F(2, 269) = 15.13$, $p \leq .001$ and coping scales $F(2, 269) = 26.73$, $p \leq .001$ between the groups of gamblers with different severity levels. A posteriori analyses indicated that problem gamblers with higher levels of severity (loss of control), compared to the other two groups of gamblers (low and moderate severity levels), scored higher on the coping scale. Likewise, gamblers with moderate severity level also scored higher on this scale than low-severity gamblers. Furthermore, problem gamblers and moderate-severity gamblers scored higher than low-severity gamblers on the enhancement scale. No significant differences were found in the social motives for gambling.

GMQ-F Model: Significant differences were found between the groups with different severity levels for the enhancement $F(2, 269) = 13.35$, $p \leq .001$, coping $F(2, 269) = 28.41$, $p \leq .001$ and financial scales $F(2, 269) = 21.57$, $p \leq .001$. The *post hoc* analyses showed that gamblers with scores indicating greater severity, compared to those with moderate and low severity, were significantly more likely to gamble from coping and financial motives. Moreover, gamblers with moderate severity scored significantly higher than those with low severity on these two scales. In addition to this, participants with high and moderate gambling severity levels scored significantly higher on the enhancement scale than those with low problem gambling level. No significant differences were found in the social motives for gambling.

Confirmatory factor analysis

First, all the items were inspected in order to assess the quality of the database. No missing cases were observed given the online survey methodology employed in this study. In order to check the assumptions of normality of the sample we carried out skewness and kurtosis analyses for each item. Seven items presented kurtosis and skewness indices greater than +2.00 and -2.00, which according to the literature is inadequate (George & Mallery, 2003); the rest of the items presented values within the bounds of acceptability. Taking into account the Mardia coefficient (≥ 5), we used the maximum likelihood (ML) estimation method with the Satorra-Bentler robust correction.

GMQ Model (three factors, 15 items): The normalized Mardia coefficient value (79.8695) indicated that the items did not follow the multivariate normal distribution. The goodness-of-fit statistics for this model revealed an excellent fit to the data: Satorra–Bentler χ^2 (df = 87) = 247.1645, p<.000; CFI = .970; RMSEA = .074 (90% confidence interval = .063 to .084). The standardized factor loadings ($p \leq .05$) in the social factor ranged from .65 to .74, in the enhancement factor from .70 to .93, and in the coping factor from .65 to .83.

Table 2
Standardized factor loadings of each one of the gambling motives items, for the two models, GMQ and GMQ-F.

	β GMQ	β GMQ-F
SOCIAL		
It's a way to celebrate	.68	-
Because it's what most of my friends do when they meet up	.65	.80
For socializing	.66	.74
Because it's something I do on special occasions	.74	.52
Because it makes a social gathering more fun	.77	.83
ENHANCEMENT		
Because I like the way it makes me feel	.93	.94
Because it's exciting	.79	.77
To bring on a feeling of euphoria	.70	-
Because it's fun	.77	.77
Because it makes me feel good	.85	.86
COPING		
To relax	.77	-
Because it makes me feel more confident and sure of myself	.83	.65
Because it helps me when I feel nervous or depressed	.64	.88
To forget my worries	.80	.80
To make me feel better when I'm in a bad mood	.81	.89
FINANCIAL		
To win money	-	.86
Because I enjoy thinking about what I could do with my winnings	-	.80
Because winning could change my lifestyle	-	.83
To make money	-	.89

GMQ-F Model (four factors, 16 items): The normalized Mardia coefficient value (64.2544) indicated the absence of multivariate normality, whilst the goodness-of-fit statistics revealed an excellent fit of the model to the data: Satorra–Bentler χ^2 (df = 98) = 208.4837, p< .000; CFI = .974; RMSEA = .058 (90% confidence interval = .047 to .068). The standardized factor loadings ($p \leq .05$) for the social factor ranged from .52 to .83, for the enhancement factor from .77 to .86, for the coping factor from .65 to .89, and for the financial factor from .80 to .89.

Table 2 shows the standardized factor loadings for each one of the items that describe different gambling motives in accordance with each of the two models analyzed (GMQ and GMQ-F).

Internal consistency analysis

The results obtained on analyzing the reliability of the sub-scales of the two models (GMQ and GMQ-F) provided evidence of the models' sound functioning. Specifically, the three sub-scales of the GMQ Model yielded adequate internal consistency values: social (α = .75), enhancement (α = .87) and coping (α = .81). In turn, the four sub-scales of the GMQ-F Model also yielded adequate reliability values: social (α = .73), enhancement (α = .84), coping (α = .77) and financial (α= .88). These results indicate that the analyses of the individual reliability of each item carried out on the two models (GMQ and GMQ-F) provide evidence of the sound functioning of all of them.

Multiple regression analysis: concurrent validity

For the hierarchical regression analysis, in the first step we inputted the socio-demographic variables age and sex, and in the second step the gambling motives scales corresponding to each of the two modes analyzed. The criterion variable was problem gambling severity level.

GMQ Model: In the first step, the socio-demographic variables explained .06% of the variance of the criterion variable, F (2, 267) = 8.60 =, p< .001. Male participants (β = -.25, t = 4.13, p< .001) scored higher on the instrument for detecting problem gambling. Participants' age was not associated with greater severity. In the second step, inputting the three GMQ scales (social, coping and enhancement) led to an increase in explained variance to 28% F (3, 264 = 27.33, p< .001. Specifically, greater frequency of gambling from motives of enhancement (β = .23, t = 3.04, p<.01) and of coping (β = .40, t = 5.58, p<.001) was associated with greater severity measured by the PGSI. The social scale had a negative effect on severity level (β = -.22, t = 3.46, p< .001). Furthermore, we observed a reduction in the regression coefficient for sex (from -.25 to -.15), indicating partial mediation of the motives in the effect that being male has on the criterion variable. These results are presented in Table 3.

GMQ-F Model: The socio-demographic variables inputted in the first step explained .06% of the variance of the criterion variable, F (2, 267) = 8.60 =, p< .001. This is based on the fact that male participants (β = -.25, t = 4.13, p< .001) obtained scores indicating higher problem gambling severity. In the second step we inputted the four GMQ-F scales: social, coping, enhancement and financial, and the explained variance increased by 28%, rising to 34% [*F change* (4,263 = 27.59, p< .001]. Higher scores on the scales of enhancement (β = .16, t = 2.37, p< .05), coping (β = .36, t = 5.70, p< .001) and financial motives (β = .24, t = 4.34, p< .001) were associated with higher problem gambling severity levels. The social scale was again found to have a negative effect on severity level (β = -.17, t = 2.73, p< .01). In turn, once again we observed a reduction in the regression coefficient for the socio-demographic variable sex (from -.25 to -.15), indicating partial mediation of the gambling motives on the criterion variable. These results are shown in Table 3.

Table 3
Multiple regression analysis for predicting problem gambling severity.

		GMQ		GMQ-F	
		β	*t*	β	*t*
1st	Sex	-.245	-4.131***	-.245	-4.131***
	Age	-.020	-.343	-.020	-.343
2nd	Sex	-.152	-2.857**	-.155	-3.042**
	Age	-.006	-1.104	-.104	-1.997*
	Enhancement	.225	3.035*	.161	-2.734*
	Social	-.224	-3.462**	-.168	2.374*
	Coping	.399	5.584***	.358	5.695***
	Financial	-	-	.236	4.344***
	Durbin-Watson:	2.089			1.997
	R	.532			.582
	R^2	.283			.338

*** $p \leq .001$; ** $p \leq .005$ y * $p \leq .05$

Discussion

The purpose of the present work was to examine the psychometric properties of the structure and the internal consistency of the Gambling Motives Questionnaire (GMQ; Stewart & Zack, 2007) in its version adapted for Spanish-speaking population. The GMQ, derived from the field of alcohol-use research, has shown adequate functioning in various studies with gamblers (Parhami et al., 2012; MacLaren et al., 2012; Stewart & Zack, 2007). However, it fails to address a motivational aspect that appears to be relevant in gambling: the financial angle (Dechant, 2014; Lee et al.,

2007). In the present study we analyzed, by means of confirmatory factor analysis, the fit of the structure proposed by the GMQ (Stewart & Zack, 2007) and also the structure posited by the GMQ-F (Dechant, 2014), a model incorporating a scale that enquires about the frequency with which one gambles out of motives such as *to win money* or because *winning could change my lifestyle*. Furthermore, and through multiple regression analysis, we analyzed the concurrent validity of the scales of both models for predicting level of problem gambling severity.

An interesting finding is that 17% of the participants (of the total 270 that filled out the PGSI) obtained scores indicating a problem gambling severity level of between moderate and high. This prevalence is somewhat lower than that reported in previous studies with general population (Parhami et al., 2012; Stewart & Zack, 2007) or with gamblers recruited close to horse-racing venues (MacLaren et al., 2012), but higher than that found in previous studies in Argentina (Tuzinkievich et al., 2013a, 2013b). Notably, the sample in the present study was made up of people from the general community that had gambled in any way in the previous six months, whilst previous data on the prevalence of gambling in the local population come exclusively from university students.

Also of interest is the fact that, as observed in previous studies with gamblers, the coping, enhancement (MacLaren et al., 2012; Parhami et al., 2012; Stewart & Zack, 2007) and financial motives (Dechant, 2014) were the most common among gamblers with high problem gambling severity, followed by those with moderate severity level, and finally, by those with low risk of gambling problems. Gambling motives, then, undoubtedly permit us to distinguish between gamblers with different severity levels. Specifically, significant differences were observed in the coping and financial motives among all the groups of gamblers with different severity levels, and in the enhancement motive between those with low severity level and the two highest-severity groups. The social motive, as found in previous studies (Dechant, 2014; MacLaren et al., 2012), did not have the same utility for distinguishing between these groups of gamblers.

The results of the confirmatory factor analysis indicate that the GMQ and GMQ-F show adequate fit to the data for the local population. Specifically, both the model that proposes gambling motives grouped in three dimensions and that which also incorporates financial motives showed excellent fit to the data. Likewise, all the items presented high standardized factor loadings. In addition, all the scales of both models yielded adequate internal consistency values (≤ .70). The GMQ-F, on the other hand, showed better fit than the GMQ according to the root mean square error of approximation (RMSEA).

The concurrent validity analysis indicated, in a similar way to what was found in previous research, that men were more likely to present high severity levels (Stewart and Zack, 2008) or high gambling frequency (Dechant, 2014) than women. In contrast to the findings of Stewart and Zack (2008), but coinciding with those of Dechant (2014), no differences were found in relation to participants' age. The enhancement and coping motives scales, in the case of both the GMQ model and the GMQ-F model, had a positive and significant effect on gambling severity, even after controlling the effects of the socio-demographic variables age and sex. These results provide further evidence about the relation between this cognitive variable and greater presence of gambling problems. In addition, the incorporation of the scale referring to financially-motivated gambling increased the percentage of variance explained by gambling motives from .22% to .28%. These results suggest, in a similar way to those of other studies, that the incorporation of motives referring to financial or monetary aspects improves the prediction of greater gambling frequency (Dechant, 2014) and of problem gambling (Lee et al., 2007). The social scale motives had a significant – though negative – effect on the level of problem gambling. Bearing in mind that this scale presented a null bivariate correlation with severity level (r = .09), this negative effect at a multivariate level may be due to a suppression effect. A similar situation was found in previous studies in relation to the conformity scale of the Drinking Motives Questionnaire (Hauck-Filho et al., 2012; Mezquita et al., 2011).

All in all, the results of the present study indicate that the two models analyzed show an excellent fit to the data from this sample of gamblers from the general community. However, the GMQ-F model allows better discrimination between problem gamblers with different levels of severity. Specifically, gamblers with scores indicating problem gambling with negative consequences and loss of control gamble mainly out of financial motives, and their frequency of gambling in response to these motives distinguishes them from the rest of the gamblers. Moreover, the multiple regression analysis provided more evidence about the utility of this scale for predicting greater problem gambling severity. In sum, although the Spanish versions of both models show adequate psychometric properties, the GMQ-F model emerges as a more comprehensive alternative than the GMQ for measuring gambling motives.

Some limitations should be taken into account on considering the results of this study. First of all, the sample included more women than men, and a majority of young adults (over half the participants were in the age range 18 to 27, and almost 83% were aged between 18 and 37), so there is potential for bias related to sex and age. Furthermore, there may be differences between those who actually filled out the questionnaires and those who read the invitation to participate but, despite meeting the requirements to take part in the study, declined to do so. Such limitations make it difficult to generalize the results to the rest of the population; nevertheless, it is worth highlighting the fact that the results

coincide, in general, with those obtained in samples selected by means of methods using stratification by location, age and sex (Dechant, 2014). A further limitation concerns the simultaneous measurement of gambling motives and problem gambling severity: this aspect undoubtedly restricts the possibility of accurately predicting the problems associated with gambling from the motives to which people attribute their gambling. In this regard, future research should consider the possibility of employing a prospective design in which the motives would be assessed prior to the problems. This type of design would make it possible to determine the utility of gambling motives for predicting the presence of problem gambling.

Regardless of these limitations, though, the results reported here provide evidence on the adequate functioning of the functioning of the GMQ, and especially of the GMQ-F, for measuring gambling motives in peope from the general population.

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Conflicts of interests

The authors declare that they have no conflicts of interests.

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