The Severity of Gambling and Gambling Related Cognition as Predictors of Emotional Regulation and Coping Strategies in Adolescents

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Abstract
People with gambling disorder (GD) exhibit distorted cognitions and superstitious beliefs more often than the general population. Similarly, difficulties in coping and emotion dysregulation are more prevalent among those with GD, and could determine the onset of GD in particularly vulnerable groups such as adolescents. This study examines the relationship between gambling severity and gambling-related cognitions with coping strategies and emotion regulation. Also, it explores how accurately gambling severity and gamblingrelated cognitions were able to predict emotion regulation and coping strategies. Two groups were recruited and analyzed: a community sample comprising 250 adolescents and young adults from secondary education schools, and a clinical sample of 31 patients with similar age characteristics seeking treatment for GD. The participants from the clinical sample scored higher on gambling severity, emotion dysregulation, cognitive biases, and maladaptive coping strategies. In the community sample, cognitive biases mediated the relationship between sex and emotion dysregulation and disengagement. People with GD use more often than controls maladaptive emotion regulation strategies to manage negative emotional states. This perspective emphasizes the need to focus on coping with emotions, as opposed to coping with problems, as the best approach to tackle gambling problems.

Key-words: Gambling · Adolescence · Cognitive distortions · Coping · Emotion regulation · Gambling disorder

Introduction

Gambling disorder (GD) is characterised in the DSM-5 by a persistent and recurrent gambling behaviour regardless of its negative consequences (American Psychiatric Association 2013). Adolescent gambling is gaining growing attention as research demonstrates that tackling the first manifestations of disordered gambling as early as possible is essential to minimise the harm (Sideli et al. 2018), especially considering that the epidemiological data indicates that adolescent problem gambling is between 0.2% and 12.3%, way higher than adult problem gambling estimates (Calado et al. 2017).

A major factor to differentiate recreational from problematic gamblers is arguably the way they perceive, interpret, and ascribe value to gambling (Ciccarelli et al. 2017; Labrador et al. 2019). Cognitions are capital to GD (Abdollahnejad et al. 2014), since distorted cognitions are considered etiological factors that explain an individual's vulnerability to develop gambling problems (McInnes et al. 2014). Cognitive distortions promote gambling onset and persistence (Ciccarelli et al. 2016), as well as illusion of control, salience of wins, and superstitious beliefs (MacLaren et al. 2012). Problem gamblers exhibit distorted cognitions and superstitious beliefs more often than the general population (Abdollahnejad et al. 2014; MacLaren et al. 2012), what makes them more vulnerable to developing GD (Cunningham et al. 2014; Tang and Oei 2011). A similar connection has been found in emerging adults with gambling problems, who report higher scores on cognitive distortions than non-problem gamblers (Cosenza and Nigro 2015).

Nevertheless, cognitive distortions are unlikely to provoke GD on their own, and are more likely to interact with other psychological risk factors such as coping and emotion regulation. Maladaptive coping strategies have been argued to incite problem gambling behaviour onset and maintenance (Jauregui et al. 2017). Mathieu and colleagues (2018) pointed out that specific gambling motives directly linked to specific coping strategies

are behind distorted cognitions. People with GD seem to use more emotion-oriented maladaptive coping styles such as social avoidance and self-blame (Wood and Griffiths 2007). Nonetheless, Jauregui et al. (2017) has also suggested that problem-oriented coping strategies are common among problem gamblers including wishful thinking and problem avoidance. It comes with no surprise, then, that in youth, both cognitive distortions and coping strategies appear to predict GD (Calado et al. 2017). Among coping strategies, avoidance and coping styles focused on emotions are believed to be more significant, both being typically absent in non-problem and occasional gamblers (Calado et al. 2017; Studer et al. 2016).

Maladaptive coping strategies have also been theorised to be associated with emotional dysregulation (Keough et al. 2018), which is defined by the inability to identify, modify, and redirect the flow of spontaneous emotions by means of their adequate expression and control (Gross 1998, 2002). It is unsurprising then that emotion dysregulation has been proposed as an underlying factor interfering with GD and its comorbid manifestations (Jauregui and Estevez 2019; Schreiber et al. 2012; Williams et al. 2012). Results from a meta-analysis support this argument, as emotion regulation mediated the relationship between the emergence of dysfunctional symptoms and behavioural addictions such as GD (Marchica et al. 2019).

Evidence seems to be mounting about the association of cognitive distortions and emotion regulation in the context of gambling (Navas et al. 2016). People experiencing gambling problems appear to resort to emotion regulation strategies, which could be considered a natural adaptive mechanism, to try and justify distorted cognitions about controllability and gambling outcomes (Ruiz de Lara et al. 2019).

Consequently, the aim of this study was twofold. First, it examined gambling severity and gambling-related cognitions in relation to coping strategies and emotion regulation. Second, it explored how accurately gambling severity and gambling-related cognitions

were able to predict emotion regulation and coping strategies.

Method

Sample and procedure

Both clinical and community samples were recruited for this study. The clinical participants included 31 young patients who voluntarily sought treatment at the outpatient specialised Gambling Disorder Unit at Bellvitge University Hospital in Barcelona, Spain.

These patients were diagnosed according to DSM-5 criteria, by means of face-to-face interviews. Most patients were men (n = 28, 90.3%), born in Spain (27, 87.1%), and in secondary education (n = 25, 80.6%). Mean age among the clinical sample was 20.8 years (SD = 2.4).

The community sample (n = 250) was recruited from secondary education schools from the Basque Country region in Spain following convenience sampling. Mean chronological age was 18.2 years (SD = 4.9) for this sample; 126 participants pertained to male sex (50.4%), most individuals were born in Spain (224, 89.6%) and all of them were in secondary education. Invitations were sent out to local schools and a research team member visited the participating centres to administer the paper-and-pencil questionnaires. Students completed the survey in their classrooms individually. The passing of the tests lasted approximately 40 to 50 min. The survey included general information regarding the study purposes.

Participants were not compensated. All the schools received a general feedback report.

This study was carried out in accordance with the latest version of the Declaration of Helsinki. The Ethics Committee of University of Deusto approved the study (ref number ETK-

13/15-16), and signed informed consent was obtained from all participants including parents/ tutors for those participants under the age of 18.

Measures

Gambling Disorder. Canadian Adolescent Gambling Inventory (CAGI; Tremblay, Stinchfield, Wiebe, & Wynne, 2010). Adapted to Spanish by Jimenez-Murcia et al. (2017). It is a self-report instrument that measures adverse psychosocial consequences of gambling in adolescent populations. It comprises two sections. First, it includes 20 items (using a 6-point Likert) to analyse gambling frequency, time spent gambling, gambling mode, and money or other valuable objects lost gambling. Second, it includes 24 items (on a 4-point Likert) to measure (i) problem gambling severity, (ii) psychological consequences, (iii) social consequences, (iv) financial consequences, and (v) loss of control. The CAGI includes a Gambling Problem Severity Scale (GPSS), which consists of nine items distributed through the four CAGI subscales. The scale shows excellent psychometric properties, with internal consistency values ranging from .83 to .90 in the original scale and .91 in the Spanish adaptation. Similarly, it has great convergent validity with the South Oaks Gambling Screen (SOGS) (r = *.33* in community samples and r = *.74* for clinical samples).

Cognitive distortions about gambling. Gambling Related Cognitions Scale (GRCS; Raylu & Oei, 2004). Adapted to Spanish by Del Petre el al. (2017). This instrument gauges gambling related cognitions in five domains: (i) interpretive bias, (ii) predictive control, (iii) gambling expectancies, (iv) illusion of control, and (v) perceived inability to stop gambling. It comprises 23 items on a 7-point scale. Psychometric properties are adequate, with a Cronbach's alpha of .93 for the overall scale and between .77 and .91 for individual subscales in the English original, and .94 for the overall scale and between .72 and .80 for the Spanish adaptation. Confirmatory Factor Analysis has attested to its 5-dimensional factorial solution. Concurrent

validity in all subscales has been demonstrated due to its positive correlation with the SOGS and the MULTICAGE CAD-4 (Pedrero-Pérez et al., 2007).

Coping Strategies Inventory (CSI) [31] Spanish validation by Cano et al. (2007) [32]

The scale consists of 40 items distributed in eight 5-item subscales, with scores from 0 (not at all) to 4 (totally). The instrument has a hierarchical structure, composed of eight primary subscales, four secondary subscales, and two tertiary subscales. The eight first-order subscales are: problem solving (e.g., *I stood my ground and fought for what I wanted*); cognitive restructuring (e.g., *I told myself things that helped me feel better*); social support (e.g., *I found somebody who was a good listener*); emotional expression (e.g., *I let out my feelings to reduce the stress*); problem avoidance situation (e.g., *I went along as if nothing were happening*); wishful thinking (e.g., *I hoped the problem would take care of itself*); social withdrawal (e.g., *I tried to keep my feelings to myself*); and self-blame (e.g., *I realized that I brought the problem on myself*). These subscales are further integrated into four additional secondary (second-order) subscales: problem focused engagement, emotion focused engagement, problem focused disengagement, and emotion focused disengagement. Finally, it features two tertiary subscales (global indexes): engagement and disengagement.

The CSI shows good psychometric properties, with Cronbach's alphas ranging from .75 to .89 in the eight primary subscales in the Spanish validation. Además, ha mostrado una adecuada validez factorial en su estructura de factores primarios, secundarios y terciarios (Jauregui et al., 2016). In the present study, reliability was between .75 and .89.

The Difficulties in Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) .

This instrument is made up of 36 items that gauge a number of factors concerning emotion regulation (e.g., *when I'm upset, I become angry with myself for feeling that way*). Each item is evaluated on a 5-point Likert scale ranging from 'Almost never' (0-10% of the time) to Almost always (90-100% of the time). This scale comprises six latent factors: lack of emotional

awareness, non-acceptance of emotional responses, lack of emotional clarity, difficulties engaging in goal-directed behavior, lack of emotional control, and impulse control difficulties. The previously reported psychometric properties of the instrument were excellent (Cronbach's alpha of .93; range=.73–.91, with a test-retest reliability of .88 in a 4-8-week period). Its six-factor structure has been validated in Spanish (Hervás y Jódar, 2008).

Internal consistency for all the psychometrical measures of the study is included in Table S1 (supplementary material) (all the Cronbach's alpha values were into the adequate to excellent range).

Statistical analysis

Statistical analysis was carried out with Stata16 for Windows. The association between the cognitive biases related to the gambling activity (GRCS) with the emotional ability (DERS) and coping strategies profile (CSI) was estimated with partial correlations adjusted by the participants' sex and age. Since the significance of *R*-coefficients is closely attached to the sample size, effect size was interpreted for the own *R*-value, and it was considered null for $|R|<0.10$, poor-low for $|R|>0.10$, medium-moderate for $|R|>0.24$ and large-high for $|R|>0.37$ (these last three thresholds corresponds to Cohen's-d of 0.20, 0.50 and 0.80 respectively) (Rosnow and Rosenthal, 1996).

Multiple regression was used to obtain the specific association between sex, age, gambling severity (CAGI-total) and gambling related cognitions (GRCS-total) on the emotion regulation level (DERS-total) and coping strategies (CSI scores). In these analyses, and due the large set of scales as a potential criteria, the total DERS total and the CSI second-order and global indexes were analyzed.

A path-analysis estimated the magnitude and significance of the potential associations between sex, age, gambling related variables, emotion regulation and coping strategies. In this study, this analysis was employed as a case of structural equation modelling (SEM), which

allows testing direct and indirect effects (mediational links). The maximum-likelihood estimation method was used and adequate goodness-of-fit was considered for the next criteria (Barret, 2007): non-significant by χ^2 test, Root Mean Square Error of Approximation RMSEA<0.08, Tucker-Lewis Index TLI>0.9, Comparative Fit Index CFI>0.9, and Standardized Root Mean Square Residual SRMR<0.1. The global predictive capacity of the model was measured by the coefficient of determination (CD).

Results

Characteristics of the sample

Table S1 (supplementary material) includes the frequency distribution (means and SD) for the clinical variables of the study (GPSS, DERS, GRCS and CSI scales), and the comparison between the population-based and clinical samples. As expected, the clinical sample reported higher mean levels in the gambling problem severity, emotional dysregulation profile (except for lack of emotional awareness dimension) and cognitive biases related to the gambling activity. Clinical patients also reported higher mean scores in some coping strategies dimensions, namely: wishful thinking, self-blame, social withdrawal, emotion disengagement (secondary factor) and disengagement (global index).

Association between gambling measures, emotion regulation and coping strategies

Table 1 contains the partial correlation matrix measuring the relationship between gambling severity and cognitive biases related to gambling activity with the emotion dysregulation and the coping strategies profile. Results stratified by the sample origin showed that the correlation coefficients obtained among the population-based participants were into the null to the low-poor range. However, some correlations with medium to large effect size were obtained among the clinical sample: a) as a whole, the higher level of gambling severity and cognitive biases related to gambling tended to relate with the worse difficulties in the emotion regulation; b) the gambling severity positively correlated with the coping strategies domains of

wishful thinking, self-blame and emotion disengagement; c) cognitive bias referred to the expectancies in gambling positively correlated with coping strategies emotional expression, problems avoidance, emotion engagement and problem disengagement; d) cognitive bias referred to the inability to stop gambling negatively related to the coping strategy of problem solving; and e) cognitive interpretative bias negatively correlated with coping strategy of wishful thinking.

--- Insert Table 1 ---

Non-significant parameters were found among the clinical sample in the multivariate regressions measuring the contribution of the participants' sex, age, gambling severity and gambling related cognitions on the emotion regulation and the coping strategies. Among the population-based sample, some relationships were achieved: a) the total dysregulation emotion criterion was related to the higher scores in the cognitive biases related to gambling (B=0.22, *p*=.007); b) the higher score in the criterion CSI problem engagement was related to the higher gambling severity (B=0.44, *p*=.046); c) higher score in the criterion emotion engagement was related to being female (B=3.69, *p*=.003); d) higher score in the criterion emotion disengagement was related to more severe cognitive bias related to gambling (B=0.07, *p*=.048); e) higher engagement global was more likelihood for women (B=5.89, *p*=.009); f) and higher global disengagement score was predicted for patients with more severe scores in the cognitive bias (B=0.12, *p*=.046).

Path-ways analysis

Figure 1 contains the path-diagrams with the standardized coefficients obtained among the non-clinical and the clinical samples. Continuous line is referred to significant parameters, and dash line indicates non-significant parameters. Fit statistics indicate adequate goodness-of-fit for the two SEM of the study [non-clinical sample: χ^2=5.14, p=.399; RMSEA=0.011; CFI=0.999; TLI=0.998; SRMR=0.032; clinical sample: χ^2=2.12, p=.833; RMSEA=0.001;

CFI=0.999; TLI=0.999; SRMR=0.047]. Into the non-clinical sample, the higher level in the emotion regulation was directly related to the higher level in the cognitive bias related to gambling. Among this group, global engagement obtained higher score for women, while higher global disengagement was related to higher scores in the cognitive bias related to gambling, and gambling severity was also more severe for male. The cognition bias level was a mediational variable into the relationships between sex with emotion dysregulation and disengagement: being men increases the cognitive bias score, and higher level in this variable increases the likelihood of higher scores in the difficulties in emotion regulation and disengagement. The predictive capacity for the global model was around 17% (CD=0.166).

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Among clinical patients, the higher level of emotion dysregulation was directly related to the higher cognitive bias related to gambling. Sex also indirectly contributed on the emotion dysregulation: being a man increased the cognitive biases related to the gambling activity, which contributed to increasing the likelihood of difficulties in the emotion regulation. No direct or indirect effects were found explaining the global indexes in the coping strategies scale into the clinical subsample. The predictive capacity for the global model was near 30% (CD=0.288).

Discussion

This study aimed at understanding the association between gambling severity and gambling-related cognitions with coping strategies and emotion regulation in a clinical and a community sample of young adults and adolescents. The participants from the clinical sample scored higher on gambling severity, emotion dysregulation, cognitive biases, and maladaptive coping strategies. These results are concordant with previous literature on adult problem gambling (Goodie et al. 2019; Williams et al. 2012) and adolescent problem

gambling (Calado et al. 2017).

Next, the relationships between gambling severity, gambling-related cognitive biases, emotion dysregulation, and coping strategies were analysed separately in both samples. Results showed positive correlations in the clinical sample. More precisely, gambling severity correlated with all factors of emotion dysregulation (except for the lack of emotional clarity) and total emotion dysregulation. Also, it correlated with wishful thinking, self-blame, and emotion-disengagement. These findings are in line with those studies indicating that individuals with gambling problems score higher than non-gamblers in emotional dysregulation (Jauregui et al. 2016), maladaptive problem- and emotion-focused coping strategies, as well as in self-blame, emotion-disengagement, and wishful thinking (Jauregui et al. 2017). Some authors have argued further, presenting data that show that even gamblers extracted from community samples who scored higher on GD had wishful thinking as their main strategy to cope with gambling problems (Matheson et al. 2009).

As for gambling-related cognitive biases, results showed that they correlated with emotion dysregulation and coping strategies. Previous research has contended that people with GD use more often than controls maladaptive emotion regulation strategies to manage negative emotional states, in a way that their cognitive and motivational processing of gambling behaviour becomes more erratic and ineffective, which leads to higher problem gambling severity (Navas et al. 2016). However, in the present study the value of the correlations was sensitive to cognitive bias and regulation and coping strategies types. On the one hand, correlations were negative between interpretive bias and wishful thinking, and between inability to stop gambling and problem solving. Ciccarelli et al. (2017) seem

to propose a similar negative correlation between distorted cognitions and difficulties in decision-making. Hence, distortions such as interpretive bias and inability to stop might support the maintenance of gambling behaviour while increasing the perceived inability to cope with its adverse consequences.

However, on the other hand, for gambling expectancies, a positive correlation was found with emotion expression, problem avoidance, emotion engagement, and problem disengagement. As it was previously demonstrated, problem-focused disengagement and problem avoidance are predictors of GD (Jauregui et al. 2017), what could be interpreted as a gambler's expectation to easily alleviate gambling-related negative affective states without actually coping with them in an effective and long-term manner (Shead et al. 2008). In parallel, Maniaci et al. (2017) also pointed out that people with a dysfunctional expression of certain emotions exhibit greater gambling severity, which adds to the theory that GD is in fact the result of a maladaptive emotional regulation in individuals who resort to gambling with the expectation of managing negative emotions.

Secondly, the study examined the predictive role of emotion regulation and coping strategies on gambling severity and gambling-related cognitive biases. In the clinical sample, emotion dysregulation, emotion disengagement, and global disengagement were able to predict gambling-related cognitive biases, whereas problem engagement predicted gambling severity. A rationale for these results could be found in the fact that problem engagement strategies—albeit generally thought of as adaptive—involve the modification and potential suppression of the stressor, often without reprocessing the causes behind the emotion that triggered such stressor (Estevez et al. 2017; Navas et al. 2016). This perspective

emphasizes the need to focus on coping with emotions, as opposed to coping with problems, as the best approach to tackle gambling problems in therapy. In fact, although paradoxical, there is empirical evidence supporting the idea that problem engagement is associated with higher gambling severity and gambling-related cognitive distortions (Navas et al. 2016).Consequently, it appears that coping strategies oriented towards dealing with emotional states should become part of cognitive-behavioural therapies for GD.

The results further support the previous argument by showing that a maladaptive emotional management—both in terms of emotion dysregulation and maladaptive coping strategies—is associated with cognitive biases about how gambling works, and that such distortions can be produced by subpar abilities to deal with emotions (Del Prete et al. 2017). Cognitive biases or distortions might be subjectively experienced by gamblers as protective factors against aversive events (preeminently, gambling losses), that is, mechanisms that help them to interpret negative outcomes as positive (e.g., 'I am getting closer to winning'), reducing the negative emotions involved when facing aversive events, and motivating them to continue gambling (Del Prete et al. 2017; Kunda 1990). Notwithstanding these results, the community sample showed no significant regression coefficient on this regard. Although this could be due to the small sample size, further research is required here.

Finally, path-diagrams were examined using SEM analyses. The results showed in the community sample that cognitive biases mediated the relationship between sex and emotion dysregulation and disengagement. More concretely, being men was related to increases in cognitive bias scores and an increased likelihood of higher scores in difficulties in emotion regulation and disengagement. The pattern was similar in the clinical sample

although more indirect effects were observed there. Men are thought to be more vulnerable to early onset of GD (Bastiani et al. 2013; Olason et al. 2011), being cognitive distortions and maladaptive coping strategies significant risk factors (Calado et al. 2017). Likewise, men tend to find harder to be able to identify and understand their own and others' emotions when compared to women, which in turn is associated with higher prevalence and severity of GD (Parker et al. 2008). However, the scarcity of studies carried out in women warrants further research on that front.

This research has some limitations. A relevant limitation has to do with the small size of the sample for the clinical group, which affects the internal and external validity of the work. This feature may affect particularly multivariate models. It should be considered that sample sizes in SEM studies currently used in behavioural research are typically large but considerations about the sample size requirements for these models seem to rely on outdated rules-of-thumb. Some recent studies with Monte-Carlo procedures have analysed sample size requirements for some common types of SEM (including variation by the number of factors, number of indicators, and strength of the indicator loadings; Wolf et al. 2013), and the analyses performed related to the statistical power, bias in the parameter estimates and overall solution propriety have showed that: (a) sample requirements lie within a very broad range from 30 to 460, depending on the analysis' characteristics; and (b) as a whole, solutions that fit at a given sample size, were stable relative to the results of the analysis at the next largest sample sizes. Furthermore, given the cross-sectional nature of the study, causality could not be assessed. Also, the two samples showed some differences in terms of their sociodemographic variables which could have influenced their

comparability. Finally, the use of self-reports means that results are vulnerable to demand effects.

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Compliance with Ethical Standards

Conflict of interest The authors have no conflicts of interest to declare.

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Table 1 Partial correlations (adjusted by sex and age) between gambling severity and cognitions with coping strategies and emotional regulation

	Non-clinical *(n=250)*							Clinical *(n=31)*						
	GPSS: total	GRCS: expect	GRCS: ill.cont.	GRCS: pred.cont.	GRCS: inab.stop	GRCS: Int.bias	GRCS: total	GPSS: total	GRCS: expect	GRCS: ill.cont.	GRCS: pred.cont.	GRCS: inab.stop	GRCS: Int.bias	GRCS: total
DERS: Non-accept.emot.	.046	.194	.141	.154	.162	.139	.177	**.322**†	**.494**†	.127	**.285**†	**.324**†	**.314**†	**.400**†
DERS: Difficulties dir.beh.	.203	.139	.116	.153	.081	.123	.142	**.396**†	**.415**†	.181	.237	**.290**†	**.244**†	**.343**†
DERS: Impulse control dif.	.150	.226	.161	.210	.183	.151	.212	**.606**†	**.507**†	**.329**†	**.287**†	**.601**†	**.416**†	**.536**†
DERS: Lack emot.awar.	.047	.022	.119	-.009	.071	.031	.045	**-.310**†	**-.442**†	-.073	**-.386**†	-.223	**-.275**†	**-.374**†
DERS: Limited emot.reg.	.091	.218	.157	.183	.214	.217	.221	**.311**†	**.489**†	.101	.223	**.417**†	**.258**†	**.394**†
DERS: Lack emot.clarity	.055	.049	.086	.011	.074	.018	.049	-.011	.221	**-.302**†	-.181	.110	-.053	-.018
DERS: Total score	.145	.215	.198	.177	.202	.176	.216	**.348**†	**.460**†	.102	.139	**.413**†	**.250**†	**.355**†
CSI; F1: problem solving	.090	-.086	-.065	-.018	-.099	-.089	-.077	-.009	.031	-.001	.111	**-.269**†	-.060	-.048
CSI; F1: cognitive restruc.	.104	.055	.056	.106	.040	.032	.071	.062	.221	-.023	.087	-.076	-.090	.037
CSI; F1: emotional expres.	.091	.045	.064	.122	.042	.098	.087	.154	**.354**†	.235	.168	.075	.065	.209
CSI; F1: social support	.082	.000	.077	.078	-.029	.052	.041	.131	.141	.156	.116	-.152	-.047	.036
CSI; F1: problems avoid.	.110	.167	.108	.123	.168	.093	.148	-.057	**.245**†	-.093	.162	.090	.049	.145
CSI; F1: wishful thinking	-.004	.043	.015	.043	.030	.057	.042	**.255**†	.143	-.078	-.036	-.139	**-.258**†	-.087
CSI; F1: self-blame	.096	.116	.110	.089	.127	.156	.130	**.278**†	.176	.026	-.019	-.118	-.175	-.035
CSI; F1: social withdrawal	.163	.176	.156	.139	.174	.157	.176	.148	.167	-.101	.045	.039	-.043	.049
CSI; F2: problem-engag.	.106	-.015	-.003	.054	-.030	-.025	.001	.025	.128	-.012	.111	-.203	-.081	-.012
CSI; F2: emotion-engag.	.098	.025	.080	.114	.006	.085	.072	.150	**.260**†	.206	.149	-.041	.009	.129
CSI; F2: probl-disengag.	.058	.121	.070	.096	.113	.086	.109	.138	**.249**†	-.107	.070	-.041	-.144	.026
CSI; F2: emotion-disengag.	.148	.167	.152	.131	.173	.180	.176	**.247**†	.197	-.040	.014	-.048	-.128	.006
CSI; Global: engagement	.114	.005	.043	.092	-.013	.034	.040	.100	.214	.114	.141	-.123	-.034	.069
CSI; Global: disengage.	.121	.169	.131	.132	.168	.151	.166	.204	.226	-.074	.042	-.047	-.141	.016

Note. †Bold: effect size into the medium-mean (|*R*|>0.24) to high-large (|*R*|>0.37) range.

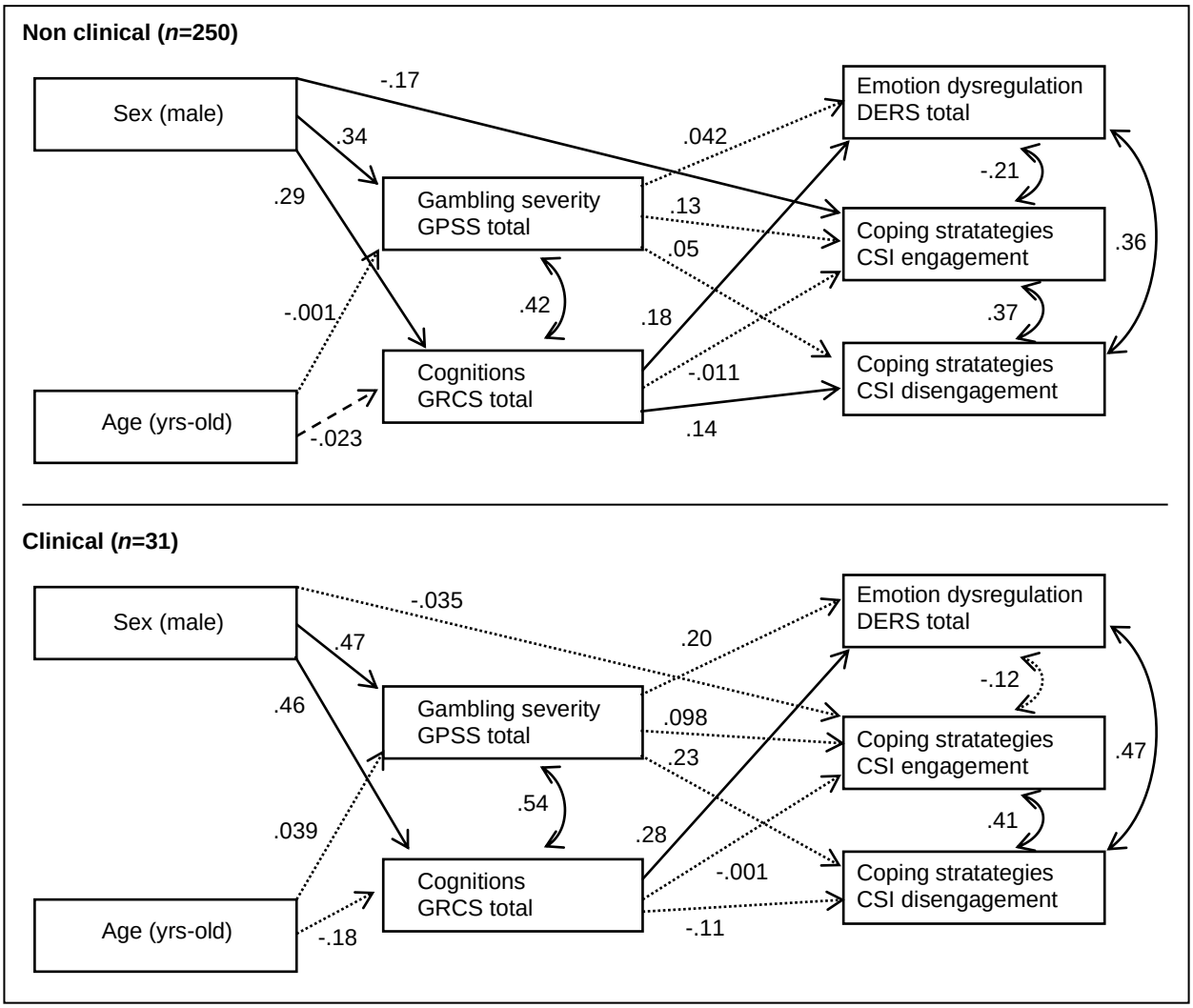

Figure 1 SEM: standardized coefficients

Note. Continuous line: significant parameter (.05 level). Dash-line: non-significant parameter.

Table S1 (Supplementary material)

Comparison between the groups for the clinical variables of the study

		Non-clinical		Clinical			
		n=250		*n=31*			
	α	Mean	SD	Mean	SD	F	*p*
GPSS: Gambling problem severity	.964	1.12	2.71	10.68	7.47	201.20	**<.001***
DERS: Non-acceptance emotional responses	.870	10.99	4.86	15.77	5.87	25.41	**<.001***
DERS: Difficulties directed behaviour	.793	12.60	4.48	14.61	4.04	5.70	**.018***
DERS: Impulse control difficulties	.811	11.75	4.56	14.06	4.76	7.02	**.009***
DERS: Lack of emotional awareness	.824	17.38	5.56	18.81	5.08	1.84	.176
DERS: Limited emotion regulation strategies	.854	15.50	6.03	19.26	6.96	10.37	**.001***
DERS: Lack of emotional clarity	.806	10.74	4.26	13.13	4.48	8.57	**.004***
DERS: Total score	.911	78.96	19.74	95.65	19.78	19.69	**<.001***
GRCS: gambling expectancies raw score	.820	5.63	3.41	11.19	5.84	60.75	**<.001***
GRCS: illusion of control raw score	.798	5.44	2.89	6.55	3.02	4.04	**.045***
GRCS: predictive control raw score	.884	9.10	5.78	13.71	8.37	15.70	**<.001***
GRCS: inability to stop gambling raw score	.849	6.44	3.78	15.74	7.91	122.46	**<.001***
GRCS: interpretive bias raw score	.830	5.87	3.65	10.55	5.92	38.61	**<.001***
GRCS: total raw score	.954	32.44	17.64	57.55	25.70	49.85	**<.001***
CSI; Factor order-1: problem solving	.831	12.40	4.66	10.26	5.22	5.66	**.018***
CSI; Factor order-1: cognitive restructuring	.788	9.94	4.98	10.10	4.21	0.03	.870
CSI; Factor order-1: emotional expression	.818	9.20	4.94	9.81	5.29	0.42	.520
CSI; Factor order-1: social support	.821	11.98	5.28	10.61	5.38	1.83	.177
CSI; Factor order-1: problems avoidance	.751	7.73	4.54	8.06	4.97	0.14	.704
CSI; Factor order-1: wishful thinking	.844	12.10	5.50	14.26	5.90	4.18	**.042***
CSI; Factor order-1: self-blame	.841	7.18	4.81	12.97	5.94	37.78	**<.001***
CSI; Factor order-1: social withdrawal	.752	6.62	4.55	8.94	5.35	6.88	**.009***
CSI; Factor order-2: problem-engagement	.870	22.36	8.69	20.35	8.52	1.47	.226
CSI; Factor order-2: emotion-engagement	.865	21.18	8.97	20.42	10.09	0.19	.663
CSI; Factor order-2: problem-disengagement	.815	19.81	8.24	22.32	8.55	2.54	.112
CSI; Factor order-2: emotion-disengagement	.851	13.80	8.12	21.90	9.77	26.24	**<.001***
CSI; Factor global: engagement	.908	43.55	16.02	40.77	17.30	0.81	.367
CSI; Factor global: disengagement	.878	33.56	13.92	44.23	17.57	15.22	**<.001***

Note. SD: standard deviation. *Bold: statistical difference (.05 level). α: Cronbach's alpha in the study.