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Gambling Among Adolescents and Emerging Adults: A Cross-Cultural Study Between Portuguese and English Youth

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Abstract
In spite of age prohibitions, most research suggests that a large proportion of adolescents engage in gambling, with problem gambling prevalence rates significantly higher than in adults. There is some evidence suggesting that there are cultural variables that might explain the development of gambling behaviours in this age group. However, cross-cultural studies on this field are generally lacking. The present study tested a model in which individual and family variables are integrated into a single perspective as predictors of youth gambling behaviour in two different contexts (i.e. Portugal and England). A total of 1137 adolescents and young adults (552 Portuguese and 585 English) were surveyed with items relating to problem gambling, gambling frequency, sensation seeking, parental attachment, and cognitive distortions. Moreover, this study is the first to examine the mediation effect of sensation seeking between attachment and youth problem gambling. Results demonstrated that English youth showed a higher prevalence of problem gambling. The findings of this study also demonstrated that sensation seeking was a common predictor, mediating the relationship between attachment and problem gambling in both countries. The findings of this study suggest that although there were some common factors between the two samples, youth problem gambling and some risk factors can be influenced by the cultural context.

Keywords Youth gambling · Adolescent gambling · Problem gambling · Gambling cross-culturally · Sensation seeking

Youth problem gambling has become an emergent public health issue in many countries, and is also viewed as an emergent area of interest within the field of adolescent risk behaviour

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more generally (King et al. 2010). A recent systematic review reported that 0.2–12.3% of youth meet the criteria for problem gambling, notwithstanding differences among assessment instruments, cut-offs, and time frames (Calado et al. 2017). Youth problem gambling has been associated with significant health and psychosocial problems, such as higher rates of suicide, increased risk for other addictions, and delinquent behaviours (Blinn-Pike et al. 2010). Therefore, there is an urgent need for a broader understanding of youth problem gambling, which takes into account a more ecological model that incorporates both individual and family variables, in order to develop more effective prevention and intervention strategies.

Within the individual domain, some studies have suggested that sensation seeking—a personality trait defined by the search for experiences and feelings, which are varied, novel, complex, and intense (Zuckerman 1994)—is associated with gambling problems (Nower et al. 2004). In fact, gambling can be a very exciting activity (e.g. Diskin and Hodgins 2003; Griffiths 1993), and therefore, it is conceivable that those who are high in sensation seeking would be more likely to be drawn to some types of gambling activities and engage in maladaptive gambling behaviours, such as chasing losses and gambling with increasing amounts of money to reach the desired levels of excitement.

A study conducted by Gupta et al. (2006) found that adolescent problem and pathological gamblers obtained significantly higher scores on sensation seeking in comparison with social gamblers. Similarly, Donati et al. (2013) in a study with Italian adolescents found that sensation seeking was a significant predictor of problem gambling. Furthermore, a more recent study conducted by Harris et al. (2015) with a sample of college students showed that the total score on sensation seeking was significantly correlated with problem gambling severity. Overall, these findings suggest that youth problem gamblers are more inclined to be socially disinhibited and easily bored with routine, and highlight the need to further examine the mechanisms of this variable in order to better identify personality characteristics that can facilitate the development of gambling-related problems, which may also have a preventive value for such risky behaviour.

In addition, a growing body of research has shown that cognitive distortions play an important role in the development of gambling-related problems, and foster the persistence of this maladaptive behaviour despite its negative outcomes (e.g., Fortune and Goodie 2012; Griffiths 1994). More specifically, cognitive distortions have been found as playing an important role in the development and maintenance of gambling problems among adolescents and emerging adults (Cosenza and Nigro 2015; MacKay and Hodgins 2012). Considering young people, research has shown that in this age group they do not appear to distinguish between the concepts of probability, luck, and/or chance, and may believe that winning or losing has more to do with fate (Froberg 2006). Furthermore, adolescents hold erroneous beliefs about their chance of winning (Joukhador et al. 2003; Wood and Griffiths 2004) and also display a more optimistic thinking about gambling as a way for generating income (Splevins et al. 2010). Furthermore, interpersonal and financial consequences of gambling have been predicted by a poorer understanding of chance and probability, and having more superstitious beliefs (Ricijas et al. 2016).

In addition to individual factors, youth gambling behaviours are associated with numerous family characteristics (Hayer and Griffiths 2015). According to McComb and Sabiston (2010), the family influences on adolescent gambling behaviour can be conceptualised in different domains, such as family sociodemographic factors, family members' attitudes, parenting practices, general family climate, and parent-adolescent relationship characteristics. Although not very studied by gambling researchers, there is some preliminary evidence that parental

attachment plays an important role in adolescent gambling behaviour (Magoon and Ingersoll 2006), although the mechanisms of the effect on this variable in youth problem gambling need further exploration. In fact, it has been suggested that sensation seeking has a negative relationship with attachment security to mothers and fathers (Sarracino et al. 2011; Curcio et al. 2017), and a secure attachment with parents might protect adolescents from engaging in problematic behaviours by reducing their levels of sensation seeking and openness of change (Barnea et al. 1992). In contrast, insecurely attached adolescents may be more likely to develop a personality trait characterised by less conservative values, higher levels of self-enhancement, and sensation seeking needs, and would therefore be more willing to explore the environment and underestimate its risks in order to look for exciting experiences that can provide them a sense of security. Subsequently, such adolescents will be more likely to engage in risky behaviours, which could compromise their healthy development (Curcio et al. 2017). However, the influence of attachment in sensation seeking has not received attention in the empirical literature. The present study examines the effect of attachment to parents or other attachment figures in youth problem gambling in an attempt to overcome the lack of attention to the influence of this variable in this behaviour (McComb and Sabiston 2010). It also tests a model in which sensation seeking mediates the relationship between attachment and youth problem gambling.

Considering a macro level of analysis, researchers have also noted that cultural differences exist in gambling patterns (Molinaro et al. 2014), due to some variations in legislation and gambling opportunities between countries (Meyer et al. 2009). In addition, individuals from one specific cultural background may view gambling as more prevalent, socially acceptable, and less risky than people from other cultural backgrounds (Kun et al. 2012).

In addition, people from different cultural backgrounds are exposed to different life circumstances and receive unique cultural values and belief systems, which could influence the development of gambling cognitions (Tang and Oei 2011). For instance, Papineau (2005) postulated that Chinese people perceive fate as something unavoidable, and gambling might be interpreted according to Chinese traditions. Consequently, the outcome of a game is used to extrapolate people's entire destiny, including business prospects and love life. Therefore, culture-specific beliefs among Chinese gamblers might contribute and reinforce the cognitions of illusion of control. Moreover, Oei et al. (2008) investigated the role of gambling cognitions and psychological states on problem gambling behaviour among Chinese and Caucasian participants living in Australia, and concluded that the Chinese group had a significantly higher illusion of control and an elevated perceived inability to stop gambling, compared to the Caucasian group. Also, Lau and Ranyard (2005) in a study conducted with Chinese gamblers and non-gamblers recruited in Hong Kong, and English gamblers and non-gamblers recruited in the UK, found that the Chinese exhibited significantly less probabilistic thinking, and displayed higher levels of risk taking in gambling.

Culture has also been recognised as a variable that can have an important influence in the development of an individual's personality traits (Schmitt et al. 2008; Triandis and Suh 2002). In fact, sensation seeking traits may also vary across cultures (Zuckerman et al. 1978; Pizam et al. 2004), and culture has also been found to moderate the impact of the sensation seeking trait on behavioural intentions (Lu et al. 2017). This finding highlights the need to examine the effect of this variable in different cultural contexts.

Rothbaum et al. (2000), for example, emphasised that the core hypotheses of attachment theory can be different from one culture to another. More specifically, they suggested that the sensitivity and responsive caregiving of mothers or other attachment figures are very different

in Japan and the USA. Japanese parents prefer to anticipate their infants' needs by relying on situational cues, which means identifying situations that may stress their infants and taking anticipatory measures to minimise the stress. On the other hand, American parents, by comparison, prefer to wait for their infants to communicate their needs before taking steps to meet those needs. Therefore, this difference in parental behaviour suggests that for Japanese caregivers, responsiveness has more to do with the parent's role in helping infants regulate their emotional states, whereas for caregivers in the USA, responsiveness has more to do with meeting children's need to assert their personal desires and, wherever possible, respecting children's autonomous efforts to satisfy their own needs. In a study observing parental behaviour by Hsu and Lavelli (2005) with American and Italian first-time mothers, it was found that Italian mothers showed more holding and handling behaviours and were more likely to openly express affection in comparison with American mothers. These findings suggest that observed parenting behaviours, which are linked to infant attachment, also reflect cultural values and beliefs (Hsu and Lavelli 2005). However, in spite of increased understanding of the influence of culture in the development of the parent-child attachment, to the present authors' knowledge, no study has examined the effect of attachment in youth problem gambling in two different cultural contexts.

Based on the literature outlined above, it is very important to validate theoretical models on problem gambling in samples from different cultures. However, in spite the importance of conducting cross-cultural research, there is still a general lack of cross-cultural studies in the gambling literature, and to our knowledge, no studies on youth problem gambling that compared Portuguese and English samples have been conducted. Although Portugal and England are two Western European countries, the two countries have profound differences in social structure, religion, demographics, philosophies, politics, ideals and cultural dimensions (Hofstede 1983; Hofstede 2001). In addition, there is good reason to speculate that the prevalence of youth with gambling problems may be markedly different for Portuguese and English youth, due to some differences in the legislation between these two countries in particular (Calado and Griffiths 2016). Furthermore, taking into account that sensation seeking, cognitive distortions, and attachment have been found to be influenced by cultural context, it is expected that these individual and family variables have different effects in youth problem gambling across the Portuguese and the English sample. Therefore, the goal of the present study is twofold. Firstly, to determine whether there are differences in the prevalence rates of gambling and problem gambling between Portuguese and English youth. Secondly, to test a theoretical model for predicting youth problem gambling across the two samples, that incorporates individual (cognitive distortions and sensation seeking) and family variables (attachment to parental figures). Within this model, sensation seeking will be hypothesised to mediate the relationship between attachment and problem gambling. The present study expands on prior adolescent gambling research by examining previously unexplored relationships between some variables that had received limited empirical attention, in two different cultural contexts.

Method

Participants

The participants comprised 1137 adolescents and young adults from Portugal and England, attending high schools and the first year of college. The Portuguese sample included 552

participants (mean age = 18.2 years; SD = 2.4), and the English sample included 585 participants (mean age = 19.1 years; SD = 1.8). Other demographic details are described in Table 1. Portuguese participants were recruited in Lisbon, whereas English participants were recruited in Nottingham.

Measures

Sociodemographic Information and Gambling Frequency Sociodemographic data were collected on age, gender, family structure (participants had to indicate with whom they lived, i.e. if they lived with both birth parents, in a single-parent family, or with other members, such as partners, friends, or flatmates), and parents' qualifications. Participants were also asked to indicate how often they had gambled during the past year from 1 ("never") to 6 ("every day").

DSM-IV-Multiple Response-Juvenile (DSM-IV-MR-J) The DSM-IV-MR-J is a psychometrically validated tool developed by Fisher (2000) for assessing youth problem gambling among those who have gambled during the past year. This instrument contains nine items and assesses a number of important variables related to youth problem gambling, such as progression and preoccupation, tolerance, withdrawal, and loss of control. The response categories comprise 1 = "never", 2 = "once or twice", 3 = "sometimes", and 4 = "often". The total score (range 0–9) was calculated by summing up the scores of all nine items. Participants who obtain a score of 0 or 1 are classified as social gamblers, a score of 2 or 3 indicates at-risk gambling, and a score of 4 or more indicates problem gambling. The present study used the validated

Table 1 Demographics background of participants

	Portuguese youth		English youth		Chi-square
	N	%	*N*	%	
Gender					
Male	256	46.4%	338	57.8%	14.79**
Female	296	53.6%	247	42.2%	
Age					
< 18 years	260	47.1%	129	22.1%	79.18**
≥ 18 years	292	52.9%	456	77.9%	
Household					
Mother and father	357	64.7%	305	52.4%	28.73**
Father	17	3.1%	52	8.9%	
Mother	105	19.0%	116	19.9%	
Others (friends, flatmates, partner)	73	13.2%	109	18.8%	
Qualification of parents					
Primary school or less	68	12.5%	0	0%	285.58**
Attendance of some secondary school	134	24.5%	0	0%	
Completed secondary school	165	30.2%	189	32.3%	
Some university	50	9.2%	129	22.1%	
Completed university	129	23.6%	267	45.6%	
Gambling frequency					
Most days	15	2.7%	33	5.6%	34.00**
At least once per week	67	12.1%	111	19.0%	
Once or twice a month	74	13.4%	92	15.7%	
Less than once a month	170	30.8%	195	33.3%	
Never	226	40.9%	154	26.3%	

*$p < 0.05$; **$p < 0.01$

Portuguese version of this scale (Calado et al. 2016) for the Portuguese sample. Cronbach's alpha of the scale for the English sample was 0.78 and for the Portuguese sample it was 0.72.

Gambling-Related Cognitions Scale (GRCS) The 23-item Gambling-Related Cognitions Scale (GRCS) developed by Raylu and Oei (2004) was used to assess gambling-related erroneous cognitions. This instrument comprises five sub-scales, which correspond to different types of cognitive distortions: *gambling expectancies* (i.e. expected benefits from gambling), *illusion of control* (i.e. the perceived ability to control gambling outcomes), *predictive control* (i.e. the misattribution of cause-and-effect relationships to unlinked events), *inability to stop gambling* (i.e. the perceived inability to stop gambling behaviour), and *interpretative bias* (i.e. an error of assessment, such as attributing wins to personal abilities). Higher scores on the GRCS indicate higher levels of cognitive distortions. In the present study, the instrument was translated and back translated to Portuguese to be administered to the Portuguese sample. Cronbach's alpha of the scale for the English sample was 0.94 and for the Portuguese sample it was 0.96.

Adolescent Attachment Questionnaire (AAQ) The AAQ developed by West et al. (1998) assesses adolescents' perceptions of relationship security with a nominated adult attachment figure on three continuous dimensions developed from Bowlby's specific ideas concerning the key characteristics of attachment relations. The first subscale (angry distress) comprises three items (e.g. "I get annoyed at my Mum/Dad because it seems I have to demand his/her care and support") and assesses anger towards attachment figures when attachment needs are frustrated. The second subscale (availability) comprises three items (e.g. "I'm confident that my Mum/Dad will listen to me") and relates to perceptions of the attachment figure as reliably responsive and available to the adolescent's attachment needs. The third subscale (goal-corrected partnership) also comprises three items (e.g. "I feel for my Mum/Dad when he/she is upset") and reflects Bowlby' concept that secure attachment bonds are characterised by an increasing sense of empathy towards the attachment figure. Individuals respond to these nine items on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). For scoring, items of the availability and goal-corrected partnership sub-scales are reversed, so that higher scores on the total scale indicate lower levels of attachment. In this study, the Portuguese version of Ribeiro and Sousa (2002) was administered to the Portuguese sample. Cronbach's alpha of the scale for the English sample was 0.88, whereas for the Portuguese sample it was 0.83.

Brief Sensation Seeking Scale (BSSS) This instrument was developed by Hoyle et al. (2002) and assessed sensation seeking. It comprises eight items which are responded on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate higher sensation seeking levels. For the present study, the Portuguese version (Chitas 2010) was administered to the Portuguese sample. Cronbach's alpha of the scale for the English sample was 0.93 and for the Portuguese sample it was 0.88.

Procedure

For participants' recruitment, similar procedures were employed in both countries. With regard to adolescents, an information letter explaining the purpose of the study was sent to the school

headmasters. If the headmaster provided permission, another letter was sent to students and their parents (if participants were minors). Only participants who provided their full informed consent participated in the study.

For recruiting young adults, some first-year college lecturers were contacted and after obtaining their permission for collecting data in their class, another letter was sent to their students. After participants provided their informed consent, they were allowed to participate in the study.

All participants completed the survey individually during class time, and were instructed that their participation was completely voluntary. Participants were requested not to write their names in order to maintain anonymity. Finally, the students were offered the possibility of contact with the authors in case they had questions or concerns regarding the study. The institutional review committee of the research team's university ethics committee provided approval for the study.

Results

Preliminary Analysis

Table 1 summarises demographics and descriptive statistics for Portuguese and English participants. The demographics between the Portuguese and English samples showed several significant differences (Table 1). Results of chi-square analyses indicated that compared to Portuguese students, the English sample was older, lived more with other people and less with their parents, and had parents that had higher educational qualifications. In addition, English youth gambled more frequently than Portuguese youth.

The five most frequent gambling activities (both land-based and online) played by Portuguese and English youth are presented in Table 2. For both samples, scratchcards and sports betting were the most popular land-based gambling activities. In addition, English youth reported playing roulette, which was a gambling activity not reported by Portuguese students. With regard to online gambling, sports betting was the most frequent gambling activity played by both samples. The second most reported online gambling activity reported by English youth

Table 2 Most frequent gambled activities (land-based and online) played by Portuguese and English youth

Portuguese youth				English youth			
Gambling activity (land based)	%	Online gambling activity	%	Gambling activity (land based)	%	Online gambling activity	%
Scratchcards	15.1	Sports betting	8.5	Sports betting	14.7	Sports betting	23.8
Sports betting	14.9	Free demo	6.2	Scratchcards	13.2	Gambling with virtual money on social networking sites	6
Lotteries	7.3	Scratchcards	5.6	Instant win games	11.8	Poker	5
Instant win games	6.2	Gambling with virtual money on social networking sites	4.4	Roulette	9.6	Roulette	4.9
Raffles	4.7	Poker	4	Lotteries	8	Scratchcards	4.6

was gambling with virtual money on social networking sites, whereas for Portuguese youth, it was gambling on free demo gambling sites. In the online gambling medium, English youth again reported playing roulette, a gambling activity not reported by Portuguese youth.

Means and standard deviations of each independent variable are presented in Table 3. Significant differences were found between the two groups in relation to sensation seeking, gambling expectancies, interpretative bias, and availability.

For each country, the sample was categorised into four gambling groups, according to the score on the DSM-IV-MR-J. The percentages of respondents in each gambling group for each country are shown in Table 4. The prevalence rate of problem gambling for the Portuguese sample was 2.6%, whereas for the English sample, it was 4.8%. The percentages of problem gambling and at-risk gambling were both higher among the English sample.

Determining the Fit of the Proposed Model

To determine the fit of the proposed model, the two-step approach recommended by Anderson and Gerbing (1988) was used. Firstly, the fit of the measurement model was assessed. Secondly, structural equation modelling was used to test the hypothesised model of youth problem gambling in each country. The bootstrapping technique was used to test the indirect effects (see Preacher and Hayes 2008; Shrout and Bolger 2002) with 5000 bootstrapping samples. Bootstrapping is a recommended method for testing mediation, as it does not require the normality assumption and has greater statistical power and control for type I error than the widely used three-step multiple regression approach (Baron and Kenny 1986) or the Sobel (Sobel 1982) test (Fairchild and McQuillin 2010; MacKinnon et al. 2002; Preacher and Hayes 2008; Shrout and Bolger 2002). Support for a mediating role is indicated if the bootstrap (bias-corrected) confidence interval does not include zero. In such cases, it can be concluded that there is a 95% probability that the indirect or mediating effect is significant. The analyses for determining the model fit were conducted in Mplus 7 (Muthén and Muthén 2015). As the dependent variable (i.e. DSM-IV-MR-J) is categorical, the robust mean- and variance-adjusted weighted least squares (WLSMV) was used to estimate the models. The WLSMV estimator produces consistent parameter estimates, unbiased standard errors with categorical variables (Brown 2006). To evaluate the fits of the measurement and structural models, a set of test statistics, which are less sensitive to sample sizes than the more traditional chi-square statistic, and identified as the best performing index for the WLSMV method (Yu and Muthen 2002)

Table 3 Mean and standard deviation of each predictor across the two samples

Variable	Portuguese youth Mean (SD)	English youth Mean (SD)
Sensation seeking	2.65 (1.03)	2.99 (0.90)***
Gambling expectancies	1.97 (1.22)	2.42 (1.28)***
Illusion of control	1.72 (1.07)	1.64 (0.97)
Predictive control	2.23 (1.36)	2.26 (1.26)
Inability to stop gambling	1.54 (1.02)	1.48 (0.93)
Interpretative bias	2.02 (1.31)	2.28 (1.34)**
Angry distress	1.98 (0.88)	1.90 (0.92)
Availability	2.29 (0.92)	2.09 (0.89)***
Goal-corrected partnership	1.85 (0.79)	1.81 (0.76)

Significant difference at $^{**}p < 0.01$, $^{***}p < 0.001$

Table 4 Gambling groups by country (%)

	Portuguese youth	English youth
Problem gamblers	2.6%	4.8%
At-risk gamblers	6.4%	8.9%
Social gamblers	50%	59.9%
Non-gamblers	41%	26.4%

were used: the Steiger–Lind root mean square error of approximation (RMSEA; Steiger 1990), the Bentler comparative fit index (CFI; Bentler 1990), and the Tucker–Lewis index (TLI, Tucker and Lewis 1973). The guidelines for evaluating the fit between the target model and the observed data were as follows: (i) RMSEA values of less than 0.06 reliably indicated good model fit for binary or ordered categorical variables (Yu and Muthen 2002) and (ii) the criteria of Browne and Cudeck (1993) that a value greater than 0.90 indicates good model fit and values of 0.80 to 0.90 indicate acceptable model fit, as the model to be tested in this study was a complex one, composed of ten latent variables. The criteria of Hu and Bentler (1999) that CFI and TLI values greater than 0.95 are indicative of a good model fit have been criticised as being too stringent when dealing with more complex models and increasing the probability of rejection (Marsh et al. 2004).

Measurement Model

For both samples, the measurement models showed a good fit—Portuguese sample, RMSEA = 0.024; TLI = 0.910; CFI = 0.917; English sample, RMSEA = 0.026; TLI = 0.910; CFI = 0.917—which suggest that, for both of them, the items adequately measured their underlying latent factors.

Structural Model

Structural equation modelling was used to examine how the three attachment dimensions (angry distress, availability, goal-corrected partnership), the cognitive distortions of gambling expectancies, predictive control, interpretative bias, illusion of control, inability to stop gambling, and sensation seeking contributed to youth problem gambling. According to the hypothesised model (see Fig. 1), sensation seeking mediates the relationship between the three attachment dimensions and youth problem gambling in both samples.

In the Portuguese sample, the hypothesised model showed a good fit (RMSEA = 0.024; TLI = 0.910; CFI = 0.917). As it can be seen in Table 5, the direct path from sensation seeking to problem gambling was significant ($b = 0.38$, SE = 0.12, $p < 0.01$). In addition, all the paths from the three attachment dimensions to sensation seeking were significant (see Table 5).

The specific indirect effect from angry distress to problem gambling via sensation seeking was significant ($b = 0.58$, SE = 0.24, 95% BCa CI = 0.30, 1.59). In other words, higher levels of anger towards attachment figures lead to higher levels of sensation seeking, which in turn increases the probability of engaging in problem gambling. In addition, the specific indirect effect of availability to problem gambling via sensation seeking was significant ($b = -2.03$, SE = 0.99, 95% BCa CI = − 7.36, − 0.96). Therefore, higher perception levels of attachment figures as responsive lead to higher levels of sensation seeking (because the items of this attachment dimension were reversed), which in turn increases the probability to engage in

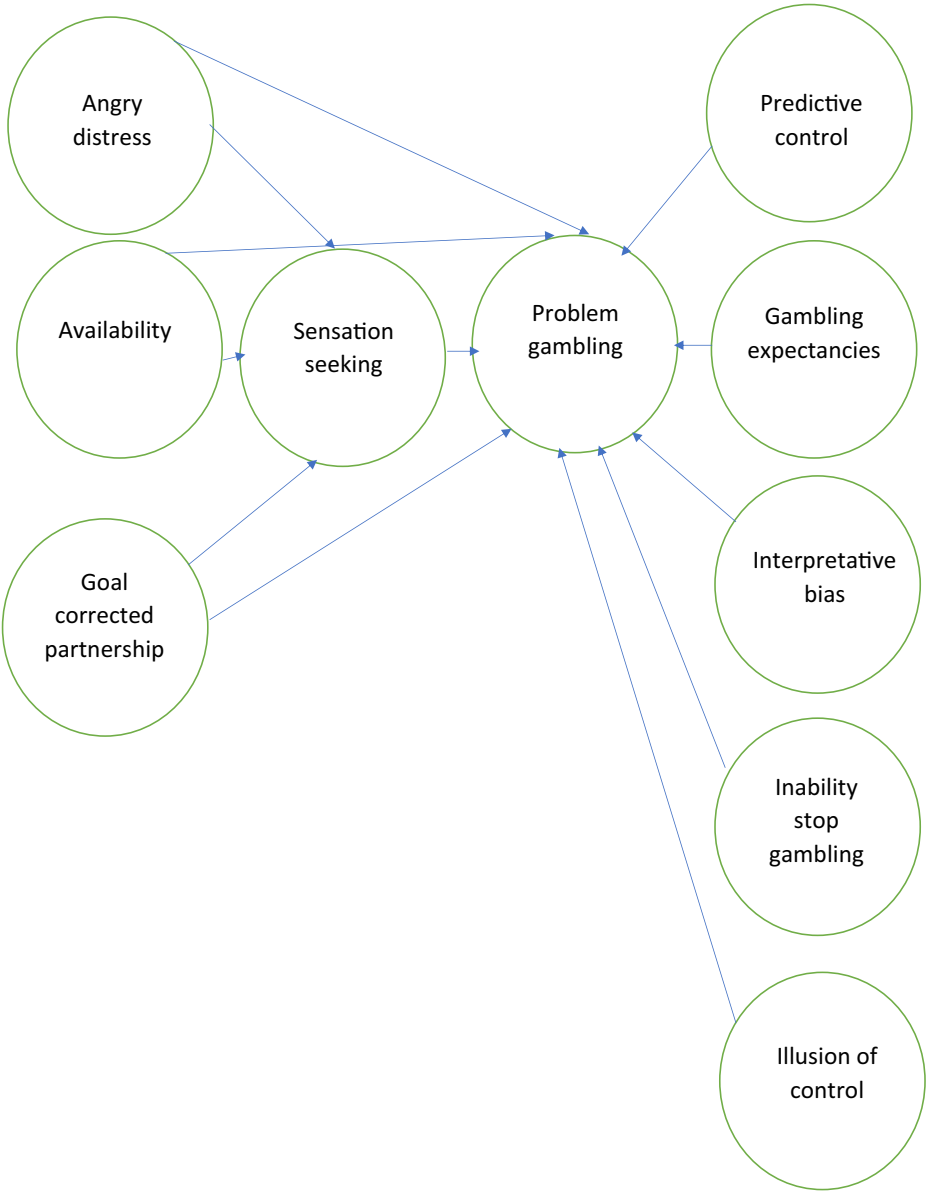

Fig. 1 Model tested in both samples

problem gambling. Finally, the specific indirect effect of the third attachment dimension, goal-corrected partnership to problem gambling via sensation seeking, was also significant (b = 1.66, SE = 0.81, 95% BCa CI = 0.79, 5.49). In other words, a low sense of empathy towards the attachment figure leads to higher levels of sensation seeking (because the items of this attachment dimension were also reversed), which, in turn, increases the probability of problem gambling. In the Portuguese sample, this model accounted for 81.8% of the variance of problem gambling and 8.1% of the variance of sensation seeking.

Table 5 Direct paths to all dependent variables in the study

	B	SE	*p*
Portuguese youth			
Direct paths to problem gambling			
Sensation seeking ➞ problem gambling	0.38	0.12	< 0.01
Gambling expectancies ➞ problem gambling	− 0.24	0.69	0.73
Illusion of control ➞ problem gambling	− 0.56	0.70	0.40
Predictive control ➞ problem gambling	0.73	0.44	0.09
Inability to stop gambling ➞ problem gambling	0.25	0.40	0.53
Interpretative bias ➞ problem gambling	− 0.01	0.28	0.99
Angry ➞ problem gambling	0.15	0.62	0.81
Availability ➞ problem gambling	0.13	2.46	0.96
Goal-corrected partnership ➞ problem gambling	− 0.07	2.03	0.97
Direct paths to sensation seeking			
Angry ➞ sensation seeking	1.51	0.49	< 0.01
Availability ➞ sensation seeking	− 5.33	1.89	< 0.01
Goal-corrected ➞ partnership sensation seeking	4.36	1.55	< 0.01
English youth			
Direct paths to problem gambling			
Sensation seeking ➞ problem gambling	0.54	0.18	< 0.01
Gambling expectancies ➞ problem gambling	0.21	0.35	0.55
Illusion of control ➞ problem gambling	− 0.37	0.43	0.39
Predictive control ➞ problem gambling	0.13	0.20	0.52
Inability stop gambling ➞ problem gambling	0.24	0.15	0.11
Interpretative bias ➞ problem gambling	0.06	0.14	0.69
Angry ➞ problem gambling	− 0.13	1.04	0.90
Availability ➞ problem gambling	0.39	2.83	0.89
Goal correct partnership ➞ problem gambling	− 0.38	2.11	0.86
Direct paths to sensation seeking			
Angry ➞ sensation seeking	1.34	0.51	0.01
Availability ➞ sensation seeking	− 3.10	1.30	0.05
Goal-corrected partnership ➞ sensation seeking	2.07	1.00	0.05

In the English sample, the hypothesised model showed a good fit (RMSEA = 0.026; TLI = 0.908; CFI = 0.915). The direct paths to problem gambling are presented in Table 5. It can be seen that the direct path from sensation seeking to problem gambling was significant ($b = 0.54$, SE = 0.18, $p < 0.01$), but there were no other significant paths to problem gambling. The direct paths from the three attachment dimensions to sensation seeking were significant (see Table 5). The specific indirect effect from angry distress to problem gambling via sensation seeking was significant ($b = 0.72$, SE = 0.37, 95% BCa CI = 0.32, 1.97). In other words, this means that higher levels of anger feelings towards attachment figures lead to higher levels of sensation seeking, which will, in turn, increase the probability of problem gambling. In addition, the specific indirect effect from the second attachment dimension, availability, to problem gambling via sensation seeking was significant ($b = -1.66$, SE = 0.91, 95% BCa CI = − 4.84, − 0.72). Thus, higher levels of perception of the parents or other attachment figures as responsive lead to higher scores of sensation seeking (because the items of this attachment dimension were also reversed), which in turn, increases the probability of problem gambling. Furthermore, the indirect effect of the third attachment dimension, goal-corrected partnership to problem gambling, via sensation seeking was also significant ($b = 1.11$, SE = 0.67, 95% BCa CI = 0.44, 3.56). In other words, this means that a low sense of empathy towards the attachment figure leads to higher levels of sensation seeking (because the items of this

attachment dimension were also reversed), which, in turn, increases the probability of problem gambling. In the English sample, this model accounted for 67.7% of the variance in problem gambling and 8% of the variance in sensation seeking.

Discussion

The present study attempted to address the lack of cross-cultural studies in the adolescent gambling literature, and tested a broader model of youth problem gambling, composed of individual and family variables in two samples from two different cultural contexts. Some significant differences were found between the two samples, the most salient being that the rates of problem gambling and at-risk gambling were higher in the English sample. This finding may be related to the fact that the English participants were older than the Portuguese participants, and they were likely to have greater access to gambling opportunities from a legal standpoint. In Portugal, the legal age for gambling on any activity is 18 years, whereas in England, the legal age for buying scratchcards and lottery tickets is 16 years (Calado and Griffiths 2016). In addition, the English gambling landscape is characterised by slot machines widely available in family leisure centres and seaside arcades, which can be legally played by children and adolescents, and therefore increases the number of legally accessible gambling opportunities for this age group (Griffiths 2008).

With regard to the most frequent gambling games, sports betting and scratchcard gambling were the land-based gambling activities most played both by Portuguese and English youth. For online gambling, these two types of gambling were also reported, but participants in both countries also mentioned gambling with virtual money via social networking sites. This finding is in line with some researchers (e.g. King et al. 2014; Griffiths 2013), who claim that gambling via social networking sites is an increasing cause for concern given the speed at which social networking sites have spread, as well as the potential for such activities to "normalise" gambling behaviours, and which might change social understandings of the role of gambling among young people. In fact, social networking utilities present gambling as a viable route for the acquisition of scarce virtual goods, and although there is no real money involved, adolescents are learning the mechanics of gambling (King et al. 2010).

Within the model of problem gambling predictors, sensation seeking emerged as a significant factor in youth problem gambling in both samples. Therefore, it appears that this personality particular trait, characterised by the search of novel and exciting experiences, constitutes a common risk factor for youth problem gambling in these two cultural contexts. This finding confirms previous research, which found a relationship between sensation seeking and problem gambling (e.g. Nower et al. 2004; Harris et al. 2015), and suggests the importance of this variable to be taken into account in future studies and testing other models for youth problem gambling.

Cognitive distortions were found to have a different effect in problem gambling among the two samples. Although no cognitive distortion had shown a significant predictive effect on problem gambling in either of the two samples, predictive control was the cognitive distortion which was closest to the statistical significance in the Portuguese youth. However, among English youth, the effect of this variable on problem gambling was smaller. Additionally, the cognitive distortion of gambling expectancies showed a negative effect on youth problem gambling among the Portuguese sample, and showed a positive effect in the English sample. These findings suggest that the effect of cognitive distortions on youth problem gambling

might be more culturally specific, which is in line with previous research (e.g. Oei et al. 2008), and highlights the need for conducting further research into the effect of cognitive distortions on youth problem gambling in different cultural contexts.

The three attachment dimensions did not show a significant direct effect on youth problem gambling in either of the two samples, but showed an indirect effect on problem gambling via sensation seeking. This finding suggests that attachment to parents or other figures does not have a direct influence on youth problem gambling, but appears to influence this risky behaviour via sensation seeking. Thus, this result could be useful in understanding the mechanisms of attachment in predicting youth problem gambling, and hopefully showing that some family variables—often conceptualised as more distal levels of influence in human behaviour—may be important in estimating the complex social forces influencing adolescents' decisions to gamble. Analysing the specific effect of each attachment dimension, it was shown that the attachment dimensions of angry distress and goal-corrected partnership have a positive and significant predictive effect on sensation seeking. Therefore, this means that higher scores on the attachment dimension of angry distress, characterised by feelings of anger towards attachment figures when attachment needs are frustrated, and lower scores on goal-corrected partnership related to a sense of empathy towards the attachment figure, increase sensation seeking, which in turn, increases the probability of problem gambling. This finding is consistent with previous research (e.g. Barnea et al. 1992) which found that a secure attachment with parents appears to protect adolescents from engaging in problematic behaviours by reducing their levels of sensation seeking. However, a noteworthy aspect is that higher scores on the attachment dimension of availability, related to the perceptions of the attachment figure as reliably responsive to attachment needs—based upon Bowlby's (1982) conception that a secure attachment involves the perception of the attachment figure as available—resulted in higher scores of sensation seeking in both samples. This finding contradicts the previous hypothesis, and it may be possible that adolescents who perceive that their attachment figures are available and responsive also perceive the surrounding environments as much more accessible, making them feel much more confident to explore nearby settings and to engage in more unconventional activities, whereas the other attachment dimensions might protect adolescents from their sensation seeking needs. However, this is speculative and suggests the need to further examine each attachment dimension, their underlying meanings, and their influence on youth problem gambling.

Overall, findings from the current study have potential practical implications. Firstly, these results suggest that adolescents and emerging adults with a personality profile characterised by the search of novel and exciting experiences, susceptibility to boredom, and non-conformity might be more at risk for developing gambling-related problems, and they may constitute possible areas to target for preventive initiatives. In addition, during treatment of problem gambling, it may also be useful to examine levels of sensation seeking and to help such individuals to fulfil their sensation seeking needs with other less problematic activities, such as sports. It was also shown that the three attachment dimensions had an indirect effect on youth problem gambling. Therefore, during clinical work with young problem gamblers, it may be important to examine their perceptions of the quality of relationships with their parents (or other attachment figures) and the meanings they attribute to their interactions. It may also be useful to include parents or other important figures in the therapeutic process in order to examine, monitor, and adapt their communications with their children.

Although this study has some strengths, such as the novelty of testing a model for predicting youth problem gambling in two different cultural contexts, and the examination

of previously unexplored relationships between attachment dimensions, sensation seeking, and problem gambling, it is not without limitations. These should be kept in mind when interpreting the findings. For instance, the present study exclusively utilised self-report data, which are prone to well-known biases, such as social desirability and memory recall. Secondly, the study employed a cross-sectional design, and therefore possible causal relationships between the variables examined cannot be inferred. The study also comprised a self-selected sample and therefore cannot be generalised to representative youth populations in either country.

Despite these limitations, the present study, as far as the authors are aware, is the first to test a model comprising individual and family variables for the prediction of problem gambling in a sample of adolescents and young adults from two different countries (Portugal and England). The present study posited a mediation model and demonstrated that sensation seeking mediates the relationship between attachment dimensions and problem gambling, and was confirmed in both samples. In addition, the present research showed that although some factors were more consistent predictors of youth problem gambling in both samples, the effect of cognitive distortions on gambling behaviour seemed to be more different in the two countries' participants (although the effect of this variable did not reach statistical significance in either country). The differences found suggest that results from predominantly Anglo-Saxon samples might not be completely applicable to Portuguese-speaking and other world populations. The present research is likely to stimulate more cross-cultural studies on youth problem gambling, which may be useful in designing culturally sensitive interventions.

Compliance with Ethical Standards All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Parental permission to participate was given for those students aged under 18 years and informed consent from all participants was obtained. Informed consent was obtained from all patients for being included in the study.

Conflict of Interest MDG's university currently receives funding from Norsk Tipping (the gambling operator owned by the Norwegian Government) for ongoing research. MDG has received funding for a number of research projects in the area of gambling education for young people, social responsibility in gambling and gambling treatment from Gamble Aware (formerly the Responsibility in Gambling Trust), a charitable body which funds its research program based on donations from the gambling industry. MDG also undertakes consultancy for various gaming companies in the area of social responsibility in gambling.
The remaining authors (FC and JA) have no conflicts of interest.

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