

**Youth gambling: The role of individual and family  
factors in youth problem gambling**

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I declare that the work presented in this thesis is, to the best of my knowledge and belief, original and my own work, except as acknowledged in the text. The material, presented as my own has not been submitted previously, in the whole or in part, for a degree at any other institution.

## **Statement of Contribution of Others**

In cases in which the work presented in this thesis was the product of collaborative efforts, I declare that my contribution was substantial and prominent, involving the development of original ideas, as well as the definition and implementation of subsequent work. Detailed information about my contribution to collaborative work in this thesis is outlined in Appendix I.

## **Dedication**

I would like to dedicate this work to my Father, António Riço Calado, who unfortunately passed away before I submit this thesis and got my first lecturer position. I really want to thank him for his inspiring life, for his precious wisdoms, and above all for always had taught me that it is possible to achieve our dreams as long as we have the courage to pursue them. Without him, I would never be able to come to England for doing my PhD. My next endeavour, following an appeal from my entire family, will be to write a book about his valuable contributions to the Portuguese community.

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## List of Outputs Arising From This Thesis

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### ***Refereed book chapter***

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### ***Non-refereed papers***

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motivations in a sample of Portuguese adolescents and young adults]. Paper presented at IX Iberoamerican Conference of Psychology, Lisbon, Portugal.

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## Abstract

Research has shown that youth engage in gambling, and for a small minority gambling can become problematic with severe negative consequences (Calado, Alexandre & Griffiths, 2017a).

Youth problem gambling is associated with several different factors, but little is known how these factors might influence or interact with each other in predicting this behavior. Moreover, although research on youth gambling had been conducted in many countries, there is still a paucity of research on this phenomenon in Portugal. Therefore, the unique contribution to knowledge of this PhD is (i) the exploration of gambling perceptions among 46 Portuguese adolescents and young adults in an attempt to obtain preliminary insights of youth gambling in this particular context; (ii) the validation of a widely used gambling instrument, the DSM-IV-J-MR into the Portuguese language; (iii) the testing of two theoretical models for predicting youth problem gambling comprising individual and family variables that have received little attention in the literature in a sample of English students, and in a sample of Portuguese and English students respectively; and (iv) the designing of a youth prevention program based on the findings from previous studies, and the delivering of this intervention among a sample of Portuguese high-school students. A mixed methods approach was taken throughout the thesis used in the form of focus groups, psychometric testing, survey, and an intervention. Data were analysed using a variety of methodological techniques including thematic analysis, mixed ANOVAs, and structural equation modelling. The results of the empirical studies indicate that (i) adolescents perceived gambling as an activity with positive outcomes, such as more entertainment, and a better life due to the money they win with this activity; (ii) the Portuguese version of the DSM-IV-MR-J showed acceptable psychometric properties and replicated the one-factor structure of the original scale; (iii) attachment is not directly associated with youth problem gambling, but has an indirect association with this variable via coping and sensation seeking; and (iv) the intervention was efficacious in improving knowledge and gambling-related misconceptions and reduced problematic gambling. Overall, this thesis contributes to a further understanding of youth problem gambling, and support the contention that gambling is a multidimensional phenomenon, in which individual and family variables should be taken into account.

## Overview

Gambling has markedly grown over the last decade, and has become a popular recreational activity worldwide. While gambling was once viewed as a disreputable activity, the social norms associated with gambling have changed. Reviews conducted in this field have shown that the recent history of gambling has been characterized by a widespread legalization of this activity (Calado & Griffiths, 2016). Consequently, gambling had become a significant generator of revenues for both the industry and governments.

Furthermore, within this context of the recent legalization of gambling and with the emergence of new forms of gambling via the Internet, adolescents and young adults have been identified as a vulnerable age group for the development of gambling-related problems (Chambers & Potenza, 2003; Koross, 2016), and therefore gambling is currently seen as an emergent area of research within the field of youth risky behaviour. Recent evidence suggest that a biopsychosocial model is needed to the study of gambling behaviour, which posits that individual, relationship, and macro-level factors play a role in the development and maintenance of youth gambling-related problems (Dowling et al., 2017).

The present thesis, fitting in with this more recent line of research, aims to expand the existing evidence base by examining how individual and relationship, namely family factors, are involved in explaining youth gambling behaviour. The first three chapters of the thesis will essentially provide an introduction to the topics investigated.

**Chapter 1** provides an introduction to gambling, and provides a definition for it, and a brief review of the psychology of gambling, by providing a description of how problem gambling is explained by different theoretical models.

**Chapter 2** explains why youth gambling is an emergent field of research, and the importance of conducting gambling research among this age group. This chapter also provides an overview of the adolescent gambling prevalence worldwide, and then will provide a more detailed examination for gambling and problem gambling for each European country that has conducted research on youth gambling. Part of this chapter was published in the *Journal of Gambling Studies* (Calado, Alexandre & Griffiths, 2017a).

**Chapter 3** provides an overview of the most relevant risk factors associated with youth problem gambling. These risk factors are presented using an ecological model, which acknowledges that there are different categories of risk factors that can have an association with the occurrence of youth problem gambling behaviour. Firstly, individual factors are presented, followed by family and macro-level factors. This chapter ends by noting the current gaps in the youth gambling literature, and how the studies in this thesis addresses these gaps via specific aims. These aims are clearly presented in the final part of the chapter. **Chapter 4** provides an overview of the methodologies that are used throughout this thesis. The thesis combines both qualitative and quantitative research methodologies, and the rationale for conducting mixed-methods research is outlined.

In **Chapters 5 to 9**, the five studies that comprise the thesis will be presented.

Given the paucity of research on youth gambling behaviour in Portugal, and because qualitative methods provide a useful approach to explore a topic when generally little or no research on it has been conducted (Howitt & Crammer, 2016), the aim of the study presented in **Chapter 5** is to explore gambling perceptions, and motivations among a sample of Portuguese adolescents and young adults. This study was mostly published in the *International Journal of Mental Health and Addiction* (Calado, Alexandre & Griffiths, 2014).

Given there are no validated Portuguese instruments to assess problem gambling, the study presented in **Chapter 6** aimed to fill this gap by testing the psychometric properties of the DSM-IV-J-MR and validating this scale into the Portuguese language. This study was published in the *International Journal of Mental Health and Addiction* (Calado, Alexandre & Griffiths, 2016).

**Chapters 7 and 8** present two studies designed to examine for the first time a theoretical model associating attachment and youth problem gambling taking into account the role of coping (**Chapter 7**), and the role of sensation seeking (**Chapter 8**). Chapter 7 was published in the *Journal of Behavioural Addictions* (Calado, Alexandre & Griffiths, 2017b), and Chapter 8 was published in the *International Journal of Mental Health and Addiction* (Calado, Alexandre & Griffiths, 2018).

**Chapter 9** attempts to address the lack of preventive initiatives in the youth gambling literature. As far as we know, the study described is the first youth gambling prevention

program ever conducted in Portugal. This study is currently under review in the *Journal of Gambling Studies*.

The final chapter of this thesis (**Chapter 10**), based on the findings of the studies presented, provides suggestions and avenues for future research, outlines recommendations and concludes by addressing the importance of considering individual, family and cultural factors when conducting research on youth gambling.



# **Chapter 1: The psychology of gambling – A review of the literature**

## **Introduction**

Gambling is a popular activity, currently widespread across the world, and being one of the few activities that cuts across age, class, and culture (Meyer, Hayer & Griffiths, 2009). Nowadays, most modern societies have some form of legal gambling. Moreover, over the past two decades, many parts of the world have experienced extraordinary increases in gambling availability, participation and expenditure (Tse et al., 2012). Hence, gambling could be argued to be a basic aspect of life in which individuals face uncertainty and risk, and studies have consistently shown that there are more gamblers than non-gamblers (Calado & Griffiths, 2016). Consequently, it becomes essential that gambling and problem gambling are well understood. Psychology, as the science of human behaviour has developed an important role in understanding this behaviour from a theoretical point of view. Therefore, this chapter will start by reviewing the definition of gambling, the diagnostic criteria for problem gambling, and then focus on its demographics. Secondly, an account of the current psychological theories that help to understand problem gambling will be presented, followed by an overview of the situation and structural characteristics of gambling activities, that also play a role in the emergence and maintenance of gambling behaviour.

## **Definition of gambling**

Gambling can be defined as the act of placing a bet or a wager, which can be in the form of money or something of value, on the results of an event where the outcome is uncertain and whereby an element of chance and risk may be involved (Polezzi, Casiraghi & Vidotto, 2012). Some gambling games require the use of some skill and knowledge, such as poker and sports betting and can give an individual an advantage over other gamblers. On the other hand, other games are completely random and unpredictable, such as bingo and lotteries (Rickwood, Blaszczynski, Delfabbro, Dowling & Heading, 2010). More recently, with the new technological advances, gambling has also developed on the Internet. Internet gambling, due to its characteristics, such as easy accessibility, and anonymity have changed the gambling experience (Griffiths & Barnes, 2008). In fact, one of the main changes that the

Internet brings to gambling is that gambling activities are brought into the home and workplace environment, and individuals do not need to travel to casino or bingo hall in order to gamble. Although gambling is generally a social and/or recreational pursuit, in few cases, it becomes problematic gambling and thus, requires clinical attention.

Pathological gambling (PG) was formally recognized by the American Psychiatric Association (APA) in the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) (APA, 1980), when pathological gambling became recognised as a mental disorder under —disorders of impulse control not elsewhere classified. Diagnostic criteria for pathological gambling were revised in 1987 for DSM-III-R (American Psychiatric Association, 1987), and again in 1994 for DSM-IV (American Psychiatric Association, 1994). In fact, for many years, the DSM-IV was the accepted criteria for pathological gambling and many screening instruments are based on it (NODS, PGSI, MAGS, DSM-IV-J, DSM-IV-J-MR). More recently, in 2013 some changes were proposed for the diagnosis of pathological gambling on the for DSM-5 (American Psychiatric Association, 2013), to simplify and streamline diagnosis without compromising validity (APA, 2012). The proposed revisions include (a) reclassification of PG from Impulse Control Disorders to a newly created category subsuming substance use and related disorders, (b) renaming of PG to Gambling Disorder, (c) lowering the diagnostic threshold from five to four criteria, and (d) removal of the illegal acts criterion (e) specifying that symptoms must be presented during a 12-month time period (Weinstock et al., 2013). Diagnostic criteria for pathological gambling in the DSM-5 (American Psychiatric Association, 2013) are presented in Table 1.

Table 1. DSM-5 Diagnostic criteria for gambling disorder. From the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition

A. Persistent and recurrent problematic gambling behaviour leading to clinically significant impairment or distress, as indicated by the individual exhibiting four (or more) of the following in a 12-month period:
1. Needs to gamble with increasing amounts of money in order to achieve the desired excitement
2. Is restless or irritable when attempting to cut down or stop gambling.

3. Has made repeated unsuccessful efforts to control, cut back, or stop gambling.
4. Is often preoccupied with gambling (e.g., having persistent thoughts of reliving past gambling experiences, handicapping or planning the next venture, thinking of ways to get money with which to gamble).
5. Often gambles when feeling distressed (e.g., helpless, guilty, anxious, depressed).
6. After losing money gambling, often returns another day to get even (“chasing” one’s losses).
7. Lies to conceal the extent of involvement with gambling.
8. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling.
9. Relies on others to provide money to relieve desperate financial situations caused by gambling
B. The gambling behaviour is not better explained by a manic episode

### **Demographics of gambling and problem gambling**

To further understand gambling and problem gambling, it is important to examine its demographics (Griffiths & Delfabbro, 2001). In fact, there are several groups that have been reported to be more likely to gamble and to develop gambling-related problems (Calado & Griffiths, 2016). For instance, men have been found to gamble more than women (Costes, Eroukmanoff, Richard & Tovar, 2015; Sassen et al., 2011; Spritzer et al., 2011), to spend more money on gambling (Raisamo, Mäkelä, Salonen, & Lintonen, 2014), and to take part in most gambling activities, with the exception of bingo and scratchcards, which are more played by women (Potenza, Maciejewski & Mazure, 2006; Wardle et al., 2011; Northern Ireland Statistics and Research Agency, 2010). Gender differences have been attributed to a number of factors, including variations in how men's and women's roles in society are viewed and their motivations (Hayer & Griffiths, 2015). In fact, gambling has historically been viewed as a male-dominated activity (Merkouris et al., 2016), with men being found to be more competitive than women (Burger, Dahlgren & MacDonald, 2006), and more likely to report gambling for enhancement (excitement or achievement) (Wardle et al., 2011). Therefore, this motivation will make men to choose more games of skill as their favourite gambling type, whereas women will choose more passive games, such as bingo and scratchcards (Burger et al., 2006).

With regard to other demographic characteristics, individuals from the oldest groups (aged 60 or more years) are less likely to gamble, whereas individuals aged between 31 and 45 years, and aged between 50 and 59 years are more likely to gamble (Welte, Barnes, Tidwell, Hoffman & Wieczorek, 2015; Northern Ireland Statistics and Research Agency, 2010). Furthermore, individuals with lower educational qualifications are more likely to gamble than individuals with higher qualifications (Costes et al., 2015; Wardle et al., 2011).

On the other hand, problem gambling is more likely to occur among men (e.g., Abbott, Romild & Volberg, 2014; Bondolfi, Osiek & Ferrero, 2000; Bonke & Borregaard, 2006; Brodbeck, Duerrenberger & Znoj, 2009; Druine, Delmarcelle, Dubois, Joris & Somers, 2006; Olason, Hayer, Brosowski, & Meyer, 2015), single or divorced individuals (Bakken, Gotestam, Grawe, Wenzel & Øren, 2009; Çakici, 2012; Druine et al., 2006; Makarovič, 2010), individuals of a younger age (Abbott et al., 2014; Kun, Balázs, Arnold, Paksi & Demetrovics, 2012; Olason et al., 2015), which constitutes a vulnerable age group for the development of problem gambling behaviour. In addition, individuals with a lower level of education are more likely to develop problem gambling (Costes et al., 2015; Meyer et al., 2015; Olason & Gretarsson, 2009), as well as individuals that belong to an ethnic minority (Makarovič, 2010; Seabury & Wardle, 2014; Wardle et al., 2011) or who had been born in another country to where they currently reside (Abbott et al., 2014; Bakken et al., 2009; Meyer et al., 2015). Furthermore, individuals unemployed or with a low income have been reported as being more likely to be problem gamblers (Castrén et al., 2013; Costes et al., 2015; Druine et al., 2006; Ilkas & Turja, 2003; Kun et al., 2012; Meyer et al., 2015; Sassen et al., 2011).

In fact, as it can be seen by the analysis of socio-demographics, problem gambling is a complex and multidimensional phenomenon. The literature shows that social, psychological and biological factors are involved in the emergence and maintenance of this behaviour. Therefore, several theoretical models attempted to explain the mechanisms underlying gambling and problem gambling. A brief overview of how the different theoretical models explains gambling and problem gambling is provided in the following section.

## **Theoretical Models**

### *Psychoanalytic model*

The first psychologists to offer an explanation for problem gambling were the psychoanalysts. However, there is no single cohesive psychodynamic or psychoanalytic theory that has been advanced in order to explain the development of problem gambling (Rickwood et al., 2010). Psychoanalytic theorists adopted the view that gambling was expressive of an underlying neurosis related to a regression to pre-genital psychosexual phases (Rosenthal, 2008). Von Hattingberg (1914, cited by Moreyra, Aibanez, Saiz-Ruiz, Nissenson & Blanco, 2000), who conducted the first study of problem gambling, proposed that problem gamblers had a fixation in the anal phase of development, which explained the compulsive and masochistic traits in their personality. It was theorized that problem gamblers eroticized the tension and fear involved in gambling.

The work of Von Hattingberg was further elaborated by Freud and Bergler who have largely influenced later psychoanalytic work on this topic. In his paper 'Dostoyevski and Parricide', Freud (1928) suggests that gambler plays to lose. Therefore, gambling constitutes a way of punishment that secondarily becomes a pleasurable activity. According to Freud, the main reason for this is young men's ambivalence towards his father. Thus, losing was a way to punish, but also could be a way to get love and acceptance.

For Bergler (1957), one of the most influential early writers on this topic, problem gambling was viewed as masochistic and related to the Oedipus complex. According to his theory, a gambler's unconscious motivations included the desire to lose and to be punished, although gamblers claim that they intend and expect to win. For Bergler (1957), the problematic gambler unconsciously resents parents and other childhood authority figures who forced him, as a child, to give up the pleasure principle to adopt the reality principle.

Given the reliance on clinical case material and absence of empirically testable hypotheses, psychoanalytic models are generally considered to be of limited utility in explaining either the onset and maintenance of problem gambling, or as a foundation for clinical interventions

(Cornish, 1978; Rosecrance, 1985), with the exception of Rosenthal and Rugle's (1994) support of insight-oriented supportive therapy. However, the psychoanalytic model is the only theory which acknowledge the unconscious determinants in gambling.

In addition, due to the absence of empirical studies, psychoanalytic studies are of limited utility as a foundation for gambling prevention initiatives.

#### *Cognitive theory*

Some authors emphasize the role of erroneous beliefs and irrational thinking, in the aetiology and maintenance of gambling and problem gambling behaviours (e.g., Griffiths, 1990; Ladouceur & Walker, 1996; Petry, 2005; Toneatto, Blitz-Miller, Calderwood, Dragonetti, & Tsanos, 1997; Walker, 1992). In order to investigate gamblers' beliefs, some authors have asked them (in experiments) to verbalize their thoughts during a gambling session, a technique called the 'thinking aloud' method. Using this method, researchers had identified that the existence of gambling-related cognitions involve misconceptions about randomness and its main derivatives, such as unpredictability and independence of events (Griffiths, 1994). By evaluating the available research literature on the erroneous thinking present during gambling, Toneatto (1999) presented a list of the most gambling relevant cognitive distortions:

- Magnification of gambling skills and minimization of other gamblers' skills, which consists in the overestimation of one's own ability to win the gambling game and underestimate other's ability to win;
- Predictive control, which reflects cognitions related to the ability to predict gambling outcomes;
- Illusion of control, that refers to overinflated estimate of personal abilities/skills in influencing the outcome of the game;
- Superstitious beliefs that refer to the belief that possessing certain objects, performing specific actions and rituals, and that certain mental states, such as optimism and prayer can influence the probability of winning;
- Selective memory, that refers to selectively recalling wins, especially large ones and difficulty in recalling losses;
- Interpretative biases that refer to cognitions related to reframing gambling outcomes, and the expectation of imminent wins after a series of losses. Interpretive biases allow problem

gamblers to excuse serious losses and explain gains in such a way that encourages unremitted gambling in spite of repeated losses;

- Temporal telescoping that refers to the belief that wins are nearer, which may lead to sit in front of a machine for hours, because they believe they are going to eventually win;
- Illusory correlation that refers to perceiving illusory correlations and assigning causality to salient features of environment that they feel correlate with gambling outcomes (e.g., gamble only when they think they are likely to win).

Based on these assumptions, cognitive therapy is one form of therapy for the treatment of problem gambling. In fact, cognitive therapy for problem gambling, focusing on the correction of the cognitive distortions has been found to reduce gambling frequency, diagnostic criteria, monetary risk, and urges to gamble (Ladouceur et al., 2001; Toneatto & Ladouceur, 2003; Sylvain, Ladouceur & Boisvert, 1997), which adds support to the idea that erroneous perceptions might be playing a role in the development and maintenance of problem gambling. In terms of prevention, there are several interventions reported in the literature that have focused on improving the knowledge and correcting the erroneous beliefs concerning gambling – more specifically the illusion of control, predictive control, erroneous perceptions concerning hazards, and interpretative bias. All these interventions were found to be efficacious and to decrease problem gambling and gambling frequency (Canale et al, 2016; Donati et al, 2014; Ferland et al. 2002).

However, in spite of some strengths of the cognitive model, for some authors (e.g., Rickwood et al., 2010), cognitive theories have some limitations because they have yet to explain the functional interaction between arousal, conditioning, and cognitive activity, or the transition from recreational to problem gambling. In addition, the empirical literature also lacks some explorations of any gender or cultural variations in cognitions among problem gamblers, which might also be beneficial (Oei, Lin & Raylu, 2008).

### *Behavioural theories*

Behavioural theory views problem gambling as a learned behaviour acquired through a process of reinforcement operating under operant and classical conditioning paradigms (Rickwood et al., 2010; Delfabbro, 2013). Firstly, operant conditioning is established through fixed and variable ratio schedules of reinforcement (e.g., sensory stimulation, short interval between stake and payout in some gambling games), in which the behaviour is

maintained by intermittent schedules of reinforcement, most likely a variable-ratio schedule (Polezzi et al., 2012). This involves the provision of infrequent rewards after varying numbers of responses. In fact, there are manifest similarities between variable schedules of reinforcement and the payout arranged in many gambling games (Petry, 2005). For instance, occasional small wins, which are delivered by slot machines, have been demonstrated to act as positive reinforcement for gamblers, generating feelings of success and leading to a greater excitement. Behavioural theory also postulates that both positive and negative reinforcement increase the probability of a gambling response being elicited and explain persistence in gambling as well (Rickwood et al., 2010).

The experience of winning, the excitement of winning and various concomitant stimuli act as positive reinforcers that help to maintain the behaviour over time (Coventry & Constable, 1999), whereas negative reinforcement is thought to occur when individuals use gambling as a way in which to escape from unpleasant experiences including depression, anxiety, boredom, and other adverse life-events (Petry, 2005). Early wins are particularly important at the initial stages of a gambling career, with almost half of the gamblers reporting a significant monetary gain in the initial phase of their disorder that could act as a trigger for it (Kassinove & Schare, 2001; Braverman & Shaffer, 2010).

On the other hand, classical conditioning takes place when individuals continue to gamble as a result of becoming conditioned to states such as the excitement or arousal associated with gambling, so that they feel bored, unstimulated, and restless when they are unable to gamble (Polezzi et al., 2012).

With regard to treatment, the types of treatment used for problem gambling, based on behavioural theories have included aversive conditioning (Barker & Miller, 1968; Koller, 1972), response prevention (Symes & Nicki, 1997) and imaginary desensitization (McConaghy, Armstrong, Blaszczyński & Allcock, 1983). Although these studies showed a significant decrease in the impulse to gamble and the corresponding behavior in the patients, they lacked valid and reliable tools to assess the outcomes. In addition, two studies compared aversive therapy to other modalities of treatment (McConaghy et al., 1983; McConaghy, Blaszczyński & Frankova, 1991) and failed to confirm an initial enthusiasm prompted by some case reports (e.g. Goorney, 1968). More recently, Smith, Battersby, Harvey, Pols and Ladouceur (2015) found that a behavioural (exposure-based) therapy with



21 participants who completed the treatment was also very effective in improving the Victorian Gambling Screen and 12 weeks and at a 6-month follow-up.

With regard to prevention initiatives, to the author's knowledge, there are very few prevention initiatives which have used the principles of behavioural theory. However, Korn et al. (2006) examined the usability of a multimedia website designed to prevent youth problem gambling through interactive games. This program included time and money management, as well as negative consequences minimization, in which, in a specific location of the website, youth were asked to assess how they spend their time throughout a day and allocate time spent on each of their daily activities. A personalized pie chart was developed, and feedback allowed them to adjust their schedules. The authors found that the youth considered the website appropriate and appealing, that they increased their knowledge and awareness of gambling, and would return to the website and recommend it to a friend if they were having a gambling problem.

Wohl et al. (2010) developed an education-based video that illustrated misconceptions about the functioning of slot machine, in which participants were told that individuals may associate losing play with a big win and may be reluctant to terminate play when they had reached their limit. The presentation concluded with some habits for problem-free gambling, which included setting a financial limit, leaving all extra money at home (i.e., avoiding the temptation to gamble beyond a predetermined budget), and leaving credit cards and debit cards at home. The results showed that compared to participants who watched the control video, those who watched the animation-endorsed strategies to gamble within financial limits, reported greater behavioral intentions to use the strategies, and exceeded their pre-set limits less frequently during their subsequent gambling session. In another study, Larimer et al. (2012), developed a prevention program for college students that used some techniques of behavioural therapy, such as functional analysis, gambling triggers, and coping with these triggers and relapse prevention. The results found that these sessions were useful in reducing gambling frequency.

However, as mentioned earlier, the incorporation of behavioural principles in gambling prevention initiatives is still limited. Future prevention programs should include more behavioural techniques in their content, such as developing alternative responses to temptations and gambling cravings, and explaining the principles of operant conditioning

that exist in some gambling games, such as slot machines, in which the provision of infrequent rewards after varying responses can lead to habitual gambling.

Despite evidence supporting behavioural theories, they fail to acknowledge the importance of internal events, as they tend to underestimate the power of individual motivation, emotions, and perceptions to influence outcomes (Raylu & Oei, 2002). Thus, although offering some explanation for persistence in gambling and insights into treatment interventions as noted above, pure learning theories are incomplete as a conceptual framework for problem gambling (Rickwood et al., 2010; Griffiths & Delfabbro, 2001).

#### *Need-state models and theories of addiction*

Need state theories postulate that individuals gamble to escape from unpleasant feeling states such as anxiety, depression, and boredom (Blaszczynski & Nower, 2002). Therefore, it can be assumed that principles of reinforcement derived from behaviour theory are also incorporated in addiction models. According to this theory, susceptibility to addiction arises as a result of personal vulnerability and to the extent to which the experience of gambling assists individuals in dealing with underlying psychological problems (Delfabbro, 2013). Both Walker (1992) and Jacobs (1986) proposed that problem gambling could often be described as a form of “psychological addiction” in that engagement in the behaviour can be negatively reinforcing. Numerous studies, for example, have shown that problem gamblers score higher on measures of depression and anxiety (Kessler et al., 2008; Lorains, Cowlshaw & Thomas, 2011; McCormick, Delfabbro & Denson, 2012), on measures of avoidant and emotion-based coping (Rodda, Brown & Phillips, 2004; Scannell, Quirk, Smith, Maddern, & Dickerson, 2000; Scherrer et al., 2007). In fact, in Jacobs’ (1986) view, there are certain physiological and psychological characteristics or experiences that can make individuals prone to this form of vulnerability. Although these factors can be studied separately, they are in fact related and both contribute to individuals’ susceptibility to addiction.

At a physiological level, some individuals may be chronically under- or over-aroused, so that they need to engage in alternative activities in order to obtain an optimal level of arousal that is hedonistically comfortable. For some, this may mean engaging in risky activity to gain excitement and an increase in physiological arousal. For others, the activity may have a cathartic or calming effect that enables individuals to reduce their arousal. At a

psychological level, problem gamblers have been found to have lower self-esteem, mood disturbances (as indicated above) and will report a history of negative life events, early childhood trauma and rejection and are more likely to have histories of early trauma, abuse or stressful life events that preceded the gambling problems (Scherrer et al., 2007; McCormick et al., 2012). Therefore, gambling is used to provide an escape from these problems.

This model has also some implications for treatment. In fact, due to the need to use gambling in order to escape from negative feelings, clinicians may need to address the psychological symptomatology underlying the gambling behaviour, acknowledging clients' histories of trauma and neglect and their comorbid problems including substance abuse.

With regard to prevention, because research has found that problem gamblers are emotionally vulnerable, prevention initiatives might need to address the possibility that problem gamblers are far more likely than non-problem gamblers to experience dissociative states. In fact, a report by the Alberta Alcohol and Drug Abuse Commission (AADAC) (2000), a prevention program for young people suggested an activity in which students were asked if they ever felt a dissociative state, such as losing track of time, feeling they were a different person, or feeling like they were in a trance. In addition, because problem gamblers may use gambling as a way to escape from unpleasant states, such as boredom, anxiety, depression and anger, having effective coping strategies in problematic situations was associated with a decreased probability of engaging in high-risk behaviour, such as gambling. In fact, some prevention initiatives found in the literature have attempted to teach more effective coping strategies. For instance, Gaboury and Ladoucer (1993) developed a prevention program for high-school students that included coping skills. Results confirmed the efficacy of the program in improving knowledge and skills for controlling gambling behavior. Additionally, Turner, Macdonald and Somerset (2008) also developed a youth prevention program that focused on random events knowledge, self-monitoring, and coping skills. The results of the study showed evidence of significant improvement in the students' knowledge of random events and knowledge of coping skills. The findings of these studies suggest that knowledge concerning coping skills can be taught, and that the introduction of these skills constitute a relevant component in preventive initiatives.

Because need-state models and theories of addiction postulate that some individuals may be chronically under-aroused or over-aroused, they need to engage in alternative activities in

order to obtain an optimal level of arousal that is hedonistically comfortable. Therefore, gambling prevention initiatives might need to target impulsivity and sensation seeking. However, to the author's knowledge, no gambling prevention programs have specifically targeted these constructs.

These models suggest that some individuals apparently have a greater need for arousal and others have a need for relaxation. Therefore, it is assumed that it is unlikely that avoidance of negative feeling states will be common to all activities or all gamblers. However, as Griffiths and Delfabbro (2001) pointed out, it is unclear why some individuals have a greater need for relaxation and arousal and whether this would be sufficient to explain normal and problem gambling. In addition, more longitudinal studies are needed in order to conclude there is a causal link between problem gambling and the prevalence of mood disorders. Thus, it may be useful to look for dispositional or biological differences to explain problem gambling.

#### *Biological and dispositional theories*

As stated above, it is helpful to consider biological theories, given that psychological explanations are insufficient to explain the full complexity of gambling behaviour. In fact, it is important to assess whether problem gamblers possess qualities that would predispose them to excessive gambling (Griffiths & Delfabbro, 2001). Genetic factors may influence problem gambling via multiple pathways and complex interactions with environmental stimuli.

More recently, large twin studies have estimated that genetic factors account for 50-60% of the vulnerability for developing problem gambling (Eisen et al., 2001; Slutske, Zhu, Meier, & Martin, 2010; Giddens et al., 2011). On the other hand, gene association studies primarily report the involvement of genes for the dopaminergic and serotonergic systems (Comings et al., 2001; Lobo et al., 2010; Wilson, Lobo, Tavares, Gentil & Vallada, 2013; see also Gyollai et al., 2014 for a review).

In fact, the work within the field of biochemistry shows increasing evidence that implicates multiple neurotransmitter systems (e.g., dopaminergic, serotonergic) in the pathophysiology of gambling disorders. The dopaminergic system is associated with reward mechanisms and addictive behaviours (Nestler, 2004) and it is hypothesized that changes in dopaminergic

pathways might underlie the seeking of rewards (i.e., gambling), that trigger the release of dopamine and produce feelings of pleasure (Zack & Poulos, 2009). Neuroimaging studies of problem gamblers have indicated diminished ventral striatum and ventromedial prefrontal cortex and ventrolateral pre frontal cortex activity during rewarding events suggestive of a blunted neurophysiological response to rewards and losses (De Ruiter et al., 2009; Reuter et al., 2005).

Traditionally, serotonin function has been considered to be of substantial importance in mediating impulse control. Human studies of problem gamblers have shown decreased concentrations of platelet monoamine oxidase B (a peripheral marker of serotonergic function) and low concentrations of serotonin metabolites in the cerebrospinal fluid (Potenza, 2001). In addition, research has suggested that problem gambling shares genetic vulnerability factors with other addictions (Slutske et al., 2000; Lang et al., 2016).

Given the important role for serotonin function in problem gambling and impulse control disorder, serotonergic drugs have been investigated in the treatment of problem gambling (Brewer, Grant & Potenza, 2008). Randomised placebo-controlled trials have been employed to evaluate the efficacy of selective serotonin reuptake inhibitors (SSRIs), such as sertraline (Saiz-Ruiz et al., 2005), fluvoxamine (e.g., Hollander et al., 2000), paroxetine (e.g., Grant et al., 2003), and escitalopram (Myrseth et al. (2011)). In a 16-week double-blind, crossover study Hollander et al (2000) reported the superior effect of fluvoxamine (40.6% improvement on the Clinical Global Impression [CGI]-PG) compared with placebo (16.6%). However, in a 6-month, double-blind, placebo-controlled study, Blanco and colleagues (2002) found that fluvoxamine treatment did not result in a statistically significant improvement, as measured by reduction in money and time spent gambling. In addition, in a double-blind, 6-month, placebo-controlled trial using sertraline, Sain-Ruiz et al. (2005) showed no statistical advantage over placebo in a group of 60 problem gamblers. Moreover, Grant et al. (2003) in a 16-week, study of paroxetine, did not find a statistically significant difference between active drug and placebo, perhaps in part due to the high placebo response rate (48% to placebo, 59% to active drug).

Furthermore, Myrseth et al. (2011) conducted a randomized controlled trial pilot study, in which one treatment group received cognitive-behavioural therapy, whereas the other group only received escitalopram at 8-weeks of treatment, and found that both groups had

significant improvements in past-week gambling urges, thoughts and behaviours. After eight weeks of treatment, the escitalopram group also had received cognitive-behavioural therapy, and at 16 weeks of treatment, the authors did not find a significant differential group effect on the outcome measures between the two groups (cognitive-behavioural therapy and escitalopram+cognitive-behavioural therapy). While overall showing mixed success, limitations of previous SSRI studies include high drop-out rates and variability in the magnitude of the placebo response observed in different trials.

In addition, the dopaminergic system, which influences reward, motivation, reinforcement of reward, and appetitive urges has been implicated in the treatment of problem gambling. Given their ability to modulate dopaminergic transmission in the mesolimbic pathway, opioid receptor antagonists (naltrexone and nalmefene) have been investigated in the treatment of this disorder (Hodgins, Stea, & Grant, 2011). Results from double-blind, placebo-controlled studies of naltrexone and multi-centre double-blind, placebo controlled trials of nalmefene suggest the efficacy of opioid antagonists in reducing the intensity of urges to gamble, gambling thoughts, and gambling behaviour (Grant, Kim & Hartman, 2009; Grant, Odlaug, Potenza, Hollander & Kim, 2010). However, a randomized control trial with bupropion, a drug with dopaminergic properties, did not differ from placebo in the treatment of problem gambling (Black et al., 2007).

These studies provide a foundation for problem gambling treatment development. In fact, some pharmacological treatments have shown preliminary efficacy, although larger studies involving more diverse groups of individuals, and less drop-outs are warranted.

Due to the nature and characteristics of these biological models, it is difficult to include these models in prevention programs. However, in gambling prevention initiatives, participants could be taught about the dopaminergic and serotonergic system in the pathophysiology of gambling disorders, and it might be useful to inform participants about ways to boost these systems. For instance, participants could be educated that practising exercise, meditation, getting some sunshine, and remembering happy events may boost serotonin levels, and that practising regular exercise, sleeping better, setting goals, and doing small tasks can boost dopamine levels (Young, 2007).

Biological models suggest that the drive toward intense is biologically prescribed, but they are unable to account for the full diversity of gambling patterns and behaviour. In addition, these theories fail to explain demographic differences in the preference for activities and variations in motivation. Neither can they explain why some activities are more ‘addictive’ than others and why the structural characteristics of specific activities can influence behaviour (Griffiths & Delfabbro, 2001).

Although the theoretical models presented above studied problem gambling as an individual level phenomenon, and consider individual action as the principal basis for the disorder, the environment is also considered to play a major role. In fact, Griffiths, Hayer, and Meyer (2009) have argued that specific situational and structural characteristics of certain gambling forms can play an important contributory factor in gambling acquisition, development, and maintenance.

#### *Situational characteristics*

Situational characteristics are primarily features of the environment, typically, accessibility factors, such as the location of the gambling venue, the number of gambling venues in a specified area and possible membership requirements, as well as or advertising and marketing that can stimulate individuals to gamble (Hayer & Griffiths, 2015). Situational characteristics can also include internal features of the venue itself (e.g., decor, heating, lighting, colour, background music, floor layout, refreshment facilities) or facilitating factors that may influence gambling in the first place (e.g., free travel to and/or accommodation at the gambling venue, free bets or gambles on particular games) or influence continued gambling (e.g., the placing of a cash dispenser on the casino floor, free food and/or alcoholic drinks while gambling).

Prevalence studies conducted over the past few decades suggest an increase in gambling involvement and problem gambling in those jurisdictions with electronic gambling machines, through establishment of casinos and non-casino gaming venues (Productivity Commission, 2010; Wardle et al., 2011). A systematic review carried out by Vasiliadis, Jackson, Christensen and Francis (2013) showed a positive relationship between a venue place and gambling involvement and that proximity to a gambling venue is related to increased expenditure, and that more individuals would travel greater distances to venues that are in close proximity (less than to 0.5 km) to places of large social congregation (e.g., churches,

schools, or shops) than to more commercially isolated venues. With regard to the association between proximity to gaming venues and problem gambling severity, the findings of the review showed that there was an increased risk of problem gambling severity with greater proximity to gaming venues. However, this risk diminishes somewhat over a number of years, adding support to the adaptation theory (LaPlante & Shaffer, 2007). This theory postulates that the emergence of gambling opportunities results in increases in gambling participation and a clustering of gambling-related problems among individuals who live close to the gambling venue. However, this increase is followed by a gradual reduction in problems as a result of the process of adaptation, that is, that residents have been exposed for so long to gambling opportunities that these products no longer have the impact that they did when they were introduced (LaPlante & Shaffer, 2007).

Additional research has found that peripheral features such as sounds, and “warm” lights play a key role in the development of gambling behaviours (Stark, Saunders & Wookey, 1982; Finlay, Marmurek, Kanetkar & Londerville, 2010). For instance, Dixon, Trigg and Griffiths (2007) showed that fast tempo music (e.g., >94 beats per minute) had a significant effect on participant’s betting speed when gambling. Similarly, Spenwyn, Barrett and Griffiths (2010) found that the combined effects of both high tempo music and red light resulted in faster bets in a computerized version of roulette. More recently, Brevers et al. (2014) examined the impact of combined red light and casino-related sounds, with or without the presence of another participant, on gambling-related behaviors, using the Iowa Gambling Task (IGT). The findings of this study revealed that participants in the conditions of IGT with combined casino related sound and red light did not exhibit slower deck selection reaction time after losses in comparison with rewards. Therefore, these results suggest that casino related environments may induce some changes in gambling behaviours, which can have important implications for prevention strategies of disrupted gambling, by targeting situational factors that could lead to an individual to gamble more that is socially accepted.

With regard to the impact of advertising on gambling behavior, a growing body of research had examined this association in the past few years. For instance, a study conducted by Derevensky, Sklar, Gupta and Messerlian (2010) with adolescents aged between 12 and 19 years found a significant correlation between problem gambling severity and viewing advertisements on television, radio, billboards, newspapers, magazines, and spam e-mails. According to this study, older youth and males were more likely to gamble after viewing an



advertisement, and the vulnerability to gambling significantly improved the prediction of problem gambling when the other predictors were already entered in the model (only gambling frequency proved to be a stronger predictor of problem gambling.).

A study conducted among 6034 Norwegian gamblers found that problem gamblers had a greater involvement with gambling advertising even when they were similarly exposed than regular non-problem gamblers (Hanss, Mentzoni, Griffiths & Pallesen, 2015). Moreover, another study carried out by Gainsbury et al. (2016) with 964 gamblers who used social media, found that moderate-risk and problem gamblers were significantly more likely to report having been exposed to social media gambling promotions and to recall interactions with gambling operators via these platforms. These findings suggest that moderate-risk and problem gamblers are more likely to be impacted by the social media promotions, which might play a role in exacerbating this behavior.

With new opportunities offered through social media channels of communication, gambling industry operators have begun to incorporate social media websites, such as *Facebook* as platforms through which to supplement traditional print and audio-visual marketing media. *Facebook* in June 2018 had on average 1.47 billion active users (Facebook, 2018) making it the most popular site. Additionally, young adults are more likely to actively use social media compared to older age groups (Duggan & Brenner, 2013). Therefore, some concerns have been raised some about the use of social media and its impact in vulnerable populations, such as youth. Gambling advertisements posted on social media websites such as *Facebook* are subject to few regulations, which might have a negative impact on this age group and should be further investigated.

#### *Structural characteristics*

Structural factors refer to the specific characteristics or design of the gambling game itself such as win probability, stake size, sound and lighting effects of the game, event frequency (how many bets an individual can place in a given period of time), payout interval (the time between starting the game and payout), jackpot size, price structure, near-miss opportunities (the psychological bias of interpreting losses as nearly wins or anticipatory of a winning streak) (Griffiths, 1993).

In fact, the gaming industry has employed numerous design features to entice individuals to gamble and keep them gambling.

The structural characteristics of a particular gambling activity may act as reinforcers for a gambling behavior, may satisfy gamblers' needs, and may actually facilitate excessive gambling (Dowling, Smith & Trang, 2005). For instance, a gambling activity characterized by a short time between the initiation of a betting event and the result of that game means that little time are given over to financial considerations, and, winnings can be re-gambled almost immediately (Parke & Griffiths, 2006). In fact, it has been demonstrated in numerous studies that gambling activities, such as slot machines, characterized by short-event frequencies are the gambling activities most played by problem gamblers (Lupu & Todirita, 2013; Calado, Alexandre & Griffiths, 2017a).

Moreover, other structural characteristics that have been found to promote a gambler's desire to continue playing include near misses (Cote, Caron, Aubert, Desrochers, & Ladouceur, 2003; Billieux, Van der Linden, Khazaal, Zullino, & Clark, 2012). Dixon et al. (2011) demonstrated that skin conductance responses and heart rate deceleration was significantly larger for near misses than either wins or losses, and these arousal responses were not mediated by players' problem gambling status. The authors hypothesized that these arousal patterns and responses are due to the experience of frustration in almost winning. In fact, the psychology of near misses postulates that gamblers becomes physiologically aroused when they almost win, and this stimulates further gambling (Griffiths, 1991a).

## **Conclusion**

Gambling and problem gambling are highly complex behaviours, which are unlikely to be explained by any single theory. In many studies that have examined problem gambling, different factors have often been studied descriptively or in isolation, without a theoretical or conceptual framework that integrates the different elements. Nonetheless, gambling, like other addictions, result from an interaction and interplay between many factors including the person's biological and/ or genetic predisposition, their psychological constitution, their social environment, and structural characteristics of the gambling activity itself (Sharpe, 2002). Psychology plays a major role in further understanding this behavior. The present chapter highlights the complexity of this phenomenon and provides a brief overview of some of the major theoretical models. Most of these theories (at least in part) are useful in order to provide a rationale for future studies. However, these theories are not completely independent from each other, and the weakness of one theory can be complemented by the

strength of the other. Therefore, gambling research is best served by a biopsychosocial model (Griffiths & Delfabbro, 2001; Griffiths, 2005) that stresses the biological and cognitive factors of the individual, but at the same time emphasises the role of interpersonal variables, such as attitudes and gambling behaviour of parents, the quality of relationship with them, contextual variables, such as situational factors of the gambling environment. Consequently, researchers should not assume that individual factors will explain the full complexity of gambling behaviour, and it might be useful to explore how individual factors might interact with other factors, such as gambling opportunities, attitudes and gambling behaviour of parents. In line with this approach, the present thesis will use a biopsychosocial model, by examining the role of individual, interpersonal and community factors in the emergence and maintenance of gambling and problem gambling behaviour.

The following chapters focus on gambling behaviour among a specific age group, that is, among youth, adolescents, and young adults, who have consistently been shown to be a vulnerable age group for the development of this problematic behaviour (Blinn-Pike, Worthy, Jonkman, 2010).

## **Chapter 2: Youth gambling: An emergent field of research**

### ***Why it is important to conduct research on youth gambling?***

For Arnett (1992), adolescence is a transitional period in which individuals undergo rapid psychological and behavioural changes, which may initiate considerable risks for deviant behaviours that affect adolescent wellbeing and potentially damage their development into adulthood. Although gambling is conceptualized as an adult activity, and many jurisdictions across the world have a minimum age of 18 years as the legal age to engage in gambling, recent evidence suggests that youth engage in gambling, with a prevalence rate higher than adults (Shaffer & Hall, 2001; Volberg, Gupta, Griffiths, Olason & Delfabbro, 2010), and that gambling is part of the life experiences for many (if not most) young individuals either actively or passively (Hayer & Griffiths, 2015). The empirical literature indicates that adolescents and young adults are highly vulnerable to gambling (Chambers & Potenza, 2003; Koross, 2016; Moore et al., 2013; Mubarak & Blanksby, 2013) and, at present, gambling is seen as an emergent area of interest within the field of youth risk behaviour.

In fact, this generation of youth have grown up in an era where gambling facilities are not only available, but also heavily advertised and promoted (Messerlian, Byrne & Derevensky, 2004). This increased availability of legal gambling has led to some increases in youth gambling and to the development of adolescent gambling problems among adolescents and young adults. In fact, research indicates that college and university students, due to their free time, money, and increased freedom, are able to play different types of games (Kam, Wong, So, Un & Chan, 2017). There are a couple of reasons that make youth gambling a worth research topic, and an emergent field of research, which will be listed below.

### ***Gambling and the digital media convergence***

The development of technology has generated new forms of gambling via video lottery terminals, mobile phone and via social networking sites (Griffiths & Parke, 2010). In fact, it has been argued that the distinction between gambling and gaming is becoming more blurred and that youth are receptive to modern forms of gambling because of the apparent similarity between these games and other technology-based games of which they are familiar (Griffiths, 2008a; Delfabbro, King, Lambos & Pugliese, 2009). For instance, many gaming sites offer rewards in the form of ‘tokens’ or ‘credits’ where gamblers can swap the tokens or credits for a monetary prize (Messerlian et al., 2004). In addition, many current video games include gambling situations into the playing experience, which are optional for the player, but are designed to entice the player to earn rewards quickly and further accelerate their progress in the game. For instance, in the video game *Fable 2*, the player is able to participate in a number of gambling activities that are modelled on blackjack, roulette, and slot machines. The player can place wagers using the game currency (coins) and may win or lose depending on chance events (King, Delfabbro & Griffiths, 2010). Moreover, the recent explosion of Internet and mobile gambling has attracted many youth, given that this age group are highly familiar and competent in using digital technologies, and therefore, they can easily assess online gambling sites (Gupta & Derevensky, 2014).

Griffiths and Wood (2007) conducted a study in which 8017 young individuals aged between 12 and 15 years of age were surveyed about their internet gambling behaviour. Their results showed that approximately one in 12 young individuals aged 12–15 years (8%) said they had played a National Lottery game on the Internet. When asked which of a series of statements best describes how they played National Lottery games on the Internet, nearly three in 10 adolescents who played online reported playing free games (29%), one in six reported that the system let them register (18%), slightly fewer played along with their parents (16%), and one in 10 used their parent’s online National Lottery account either with their permission (10%) or without it (7%). However, it should be noted that a third of online players said they “*couldn’t remember*” (35%).

More recently, Ipsos MORI (2014) carried out a survey comprising 2522 pupils aged 11–15 years. The results showed that 1% of the sample reported that they bought a National Lottery ticket on the Internet, and nearly one in seven adolescents visited the National Lottery Website. Furthermore, the findings showed that older adolescents (aged 13-15 years) were

more likely to visit the website than younger participants aged 11-12 years (15% of the older group compared with 10% of the younger group). In addition, 10% of children stated that they had played one of the free/practice gambling games on the Internet. The most popular forms of free or practice games are those such as poker or slot machines on social networking sites, such as *Facebook* (5%), followed by gambling games played via smartphones or tablets (4%).

Canale, Griffiths, Vieno, Siciliano and Molinaro (2016) analysed a national sample of Italian adolescents derived from the European School project on Alcohol and other Drugs (ESPAD). The findings of this study showed that among the 14,778 participants who completed the SOGS-RA, 15.6% (n=2299) were classified as online gamblers in the past 12 months. In addition, the overall problem gambling rate among Italian non-online gamblers was 4%, and the rate among online gamblers was five times higher at 21.9%. Subsequent analysis also showed that for online gamblers, a significant proportion of problem gamblers engaged in gambling using Internet cafes, television, and videogame consoles.

Elton-Marshall, Leatherdale and Turner (2016) in a study with 10,035 students aged 13-19 years who responded to the 2012–2013 Youth Gambling Survey (YGS) supplement, a questionnaire administered as part of the Canadian Youth Smoking Survey (YSS, 2012) in the provinces of Newfoundland and Labrador, Ontario and Saskatchewan, found that the overall prevalence of online gambling among all adolescents was 9.4%. The most frequent online gambling activity were sports betting. According to this survey, adolescents also participated in free simulated gambling activities, such as Internet poker for no money (9.1%), playing games on *Facebook* (9%), and playing Internet slots for no money (4.9%). A significantly higher proportion of those playing gambling games for money had also reported playing free simulated gambling games: 14.7% of current gamblers had played free internet poker, 8.6% had played free internet slots, and 14.6% had played gambling games on *Facebook*. Moreover, among online gamblers, 17.4% scored “high” and 18.2% scored “low to moderate” in gambling severity, whereas 1.2% of land-based only gamblers scored “high” and 7.2% scored “low to moderate” in gambling severity.

Overall, these selective studies demonstrate that adolescents can and do gamble on the Internet, and that youth online gamblers are more at-risk to develop gambling problems. Among the gambling activities most played online, adolescents report free stimulated

gambling activities, such as free demo and gambling on social networking sites. The free demo constitute simulated versions of the game offered by some gambling websites, which often do not have any age limit, and allows players to practice these gambling games for free, enabling them to learn the basic skills and gain some confidence before start playing with real money (Gainsbury, 2012; Dussault et al., 2017).

With regard to gamble on social networking sites, this is also a growing cause of concern, given the speed at which social networking sites have spread. According to some recent research, there were 25 poker applications on *Bebo* (and over 500 separate poker groups) and in excess of 100 poker applications on *Facebook* (and over 1000 separate poker groups), which are easily downloadable by those under 18 years (Griffiths & Calado, 2017). Gambling on social networking sites tend to ‘normalize’ gambling behaviours and have inflated probabilities of winning, and although players do not play with real money, they can win large amounts of virtual goods. Inflated probabilities of winning are likely to foster unrealistic expectations among adolescents and young adults to win money if they gamble for real (Gupta & Derevensky, 2014). As with the free demo versions of gambling sites, gambling on social networking sites are considered by players as a great opportunity to build gambling skills before future gambling (Kim, Wohl, Gupta, & Derevensky, 2017).

In order to understand if playing simulated gambling games can serve as a gateway to monetary gambling, numerous studies have examined the relationship between these two variables. For instance, King, Russell, Gainsbury, Delfabbro and Hing (2016) in a study with adolescent social casino gamblers found that two thirds of adolescent players (N = 130) claimed that social casino games preceded monetary gambling. Moreover, Dussault et al. (2017) in a study conducted among Canadian school pupils found that playing simulated games of poker constitutes a significant predictor of starting to play poker for real money. Furthermore, Hayer, Kalke, Meyer and Brosowski (2018) in a study conducted with 1178 pupils from Northern Germany found that recruitment into monetary gambling is significantly fostered by participation in any form of simulated Internet gambling. Therefore, these studies confirm that those who engage in simulated gambling products are more likely to participate in monetary gambling.

Additionally, gambling on social networking sites may have a social nature. In fact, players may be more likely to be induced or persuaded to play, given that these website visitors’

primary intention may have been social interaction (i.e., the primary function of the website), and one of the rewards that players obtain from gambling on social networking sites is the recognition by others (i.e., players might want to win in order to obtain greater levels of peer approval; King et al., 2010). The different types of money-free gambling (i.e., ‘demo’ or ‘free play’ versions of gambling sites), and gambling on social networking sites, may experience a different type and level of reinforcement.

Therefore, in the last two decades, the development of technology has also generated new forms of gambling. Young individuals appear to be very proficient in using technology, and thus they are very likely to be increasingly exposed to these new remote gambling opportunities (Armstrong, Rockloff, Browne & Li, 2018).

### ***Adolescent onset of gambling lead to severe gambling problems in adulthood***

Volberg (1994) found that 36% of problem gamblers identified in a population survey from Massachusetts, and 23% of problem gamblers identified in Iowa, began wagering before the age of 15 years. In contrast, only 7% of non-problem gamblers in Massachusetts and 8% of non-problem gamblers in Iowa began wagering prior to age 15 years. A study conducted by Burge, Pietrzak and Petry (2006) with 236 pathological gamblers entering outpatient treatment revealed that individuals who started to gamble during their pre/early adolescence (below 15 years), began to gamble regularly at earlier ages, and have higher scores on problem gambling (as measured by the SOGS).

More recently, Carbonneau, Vitaro, Brendgen and Tremblay (2015) investigated the developmental trajectories of gambling problems across three key periods of development (i.e., mid-adolescence, early adulthood, and age 30 years) in a cohort from the general population. Their results identified two distinct trajectories across these three developmental periods one trajectory of individuals who were unlikely to have experienced gambling problems across the 15-year period, and another trajectory that included participants likely to have experienced at least one problem over the last 12 months at each time of these developmental periods. The profile of problem gamblers who emerged in this study was characterized by an early manifestation of gambling problems, and some stability of this behaviour from mid-adolescence to the age of 30 years.



The findings of these selective studies reviewed highlight the importance of adolescence as a key developmental period, which might lead to the initiation of some risky behaviours, such as gambling, and suggest the need for further research examining adolescent gambling behaviour.

### ***Youth gambling as an emergent public health issue***

Youth gambling represents an emerging public health issue, with potentially devastating consequences (Messerlian, Derevensky & Gupta, 2005). In fact, youth problem gamblers have higher rates of suicide and increased risk for crime and delinquency (Hardoon & Derevensky, 2002; Wanner, Vitaro, Carbonneau & Tremblay, 2009). Moreover, the prevalence of problem gambling among adolescents shows a significant association with tobacco and alcohol use (Cheung, 2014; Cook et al., 2015). Adolescent and young adults with problem gambling score higher than non-gambling individuals on anxiety, depression, hostility, obsessive compulsive behaviour and somatization (Estevez, Herrero-Fernandez, Sarabia & Jauregui, 2015). Several studies have also shown an association between school achievement and problem gambling including truancy, difficulty in school, decreased academic performance, and school dropout (Froberg, Modin, Rosendahl, Tengström & Hallqvist, 2015; Spritzer et al., 2011), and with poor general health (Potenza et al., 2002). In addition, gambling problems during adolescence predict an increase in depressive symptoms in early adulthood (Dussault, Brendgen, Vitaro, Wanner & Tremblay, 2011).

Such negative outcomes have implications for the individual, significant others, as well as for society at large (Derevensky, Gupta, Hardoon, Dickson, & Deguire, 2003). However, to date, few public awareness strategies and operative social policies have been initiated to address this growing public health concern. Awareness of the risks and harm associated with gambling problems in youth and the public at-large is lacking. Therefore, there is a growing need to examine and respond to gambling problems in adolescents from a prevention and public health orientation.

Messerlian et al. (2005) outlined four public health goals – denormalization, protection, prevention, and harm-reduction – that taken together describe action needed to address problem gambling in this young population. Denormalization refers to the process of social denormalization, where society questions and assesses underage gambling. Denormalization can include drawing attention to the marketing strategies employed by the gambling industry,

and challenging some myths and misconceptions. Protection refers to the responsibility that governments, public, and industry have in protecting children and adolescents from gambling, and gambling-related harms. This includes protecting youth from exposure to gambling products, effective government legislation that promotes reduction in the accessibility and availability of all forms of regulated gambling to underage youth. Prevention refers to the increased knowledge of awareness of the risks of gambling (including online gambling on practice sites and on social networking sites) among youth, parents, and professionals. This can include the incorporation of school-based prevention programs in academic curriculums. Furthermore, developing harm-reduction programs targeting youth who are already gambling excessively, but who have not reached the level of pathological gambling. In fact, primary care providers and psychiatrists have an important role to play in screening for early identification of young problem gamblers, and their further role can also include brief intervention, and referral to treatment services for youth gambling.

### ***Adolescent gambling prevalence***

The studies outlined above demonstrate that the consequences of youth gambling-related problems can be serious. These concerns about adolescent gambling have encouraged public health workers to study the epidemiology of gambling because this helps to characterize the phenomenon (Gupta & Derevensky, 2014). Therefore, there is a need for conducting a systematic review in order to synthesize the trends in adolescent gambling and to further analyse the comparative prevalence of problem gambling rates across different countries.

Consequently, a systematic literature review was carried out. The aim of the systematic review was twofold. Firstly, to briefly review the most recent international research published since 2000, with respect to problem gambling prevalence rates among adolescents, as the past few decades have witnessed an unprecedented growth in the gambling industry, which could have led to the development of gambling-related problems among young individuals (Meyer et al., 2009). Secondly to present a more detailed picture of adolescent gambling in Europe. Although there are other reviews in the literature concerning adolescent gambling (e.g., Volberg et al., 2010; Kristiansen & Jensen, 2011), these are now outdated and/or do not provide a country-by-country overview of adolescent gambling across a whole continent. Therefore, the present review updates and expands on previous reviews and provides a brief country-by-country analysis of the evidence of adolescent gambling and problem gambling in that particular European country in alphabetical order.

## **Methods**

A literature search was carried out using the following databases: Scopus, PsycINFO, Science Direct, PsycARTICLES, PubMed, Wiley Online Library, ProQuest Dissertations and Theses Academic Search complete and Google Scholar. The following search terms were used: “youth gambling prevalence”, “adolescent gambling”, “adolescent problem gambling”, “youth gambling addiction”, “youth compulsive gambling”. The search was conducted with the same terms in English, French, Spanish and Portuguese, in order to obtain as many prevalence studies as possible and to avoid English publication bias.

The studies were selected on the basis of containing the following criteria: (1) being published since 2000; and (2) citing gambling prevalence rates for adolescents and young individuals (with an age that could range from 10 to 24 years). Moreover, reference lists of retrieved studies and from other reviews already available in the literature were also searched in order to identify any additional relevant studies. The goal was to locate all prevalence studies that were conducted at a national level. Therefore, for countries that had prevalence data at both regional and national level, only national data were considered. However, in the case of countries that did not have a national prevalence study, but instead had conducted studies at a regional level with a representative sample, these studies were included. Studies were also excluded if they (i) had a sample size of less than 500 participants, (ii) did not use a standardized instrument to assess problem gambling, and (iii) assessed problem gambling in the context of a specific form of gambling, such as Internet gambling.

## **Results**

In the first step, 54 studies were identified after a careful examination of the titles and abstracts of the studies generated by the search on the aforementioned databases and through reference lists from other studies and reviews. In the second step, studies were excluded using the following criteria: (i) a sample of less than 500 participants (three studies); (ii) did not use a standardized measure to assess problem gambling (five studies), and (iii) only examined gambling and problem gambling in the context of a specific form of gambling (two studies). Therefore, the final search yielded 44 studies, which are summarized in Table 1. The majority of studies were published in English ( $n = 42$ ), with one study in French, and one study in Spanish. Two studies were conducted in North America, one in South America, one in Asia, five in Oceania, and 35 in Europe.

Assessment of adolescent problem and pathological gambling used the South Oaks Gambling Screen Revised for Adolescents (SOGS-RA) (Winters, Stinchfield & Fulkerson, 1993), Diagnostic and Statistical Manual-IV adapted format for Juveniles (DSM-IV-J) (Fisher, 1992), Canadian Problem Gambling Index (CPGI) (Ferris and Wynne 2001), Gamblers Anonymous Twenty Questions (GA20) (Gamblers Anonymous 1984), Lie/Bet Scale (Johnson et al., 1997), and Canadian Adolescent Gambling Inventory (CAGI) (Tremblay, Stinchfield, Wiebe & Wynne, 2010).

The present review considers the combined rate of problem and pathological gambling, as many studies merge problem gambling with pathological gambling compared to behaviour from non-gamblers and non-problem gamblers (e.g., Welte, Barnes, Tidwell & Hoffman, 2008).

### **Adolescent gambling and problem gambling worldwide**

The present overview of research on adolescent gambling and problem gambling across the world conducted since 2000 shows that there are many countries that have never carried out studies on adolescent gambling behaviour. In fact, most research on adolescent gambling has been conducted in Europe, North America and Australia. However, despite the lack of research in some countries, studies show that 0.2-12.3% of youth meet diagnostic criteria for problem gambling across five continents (notwithstanding differences in cut-offs and timeframes among assessment instruments). It should also be noted that there are some variations in problem gambling prevalence rates that occur among different continents: in North America problem gambling prevalence rates ranged from 2.1 to 2.6%, whereas in Oceania these rates ranged from 0.2 to 4.4%. In Europe, problem gambling prevalence rates ranged from 0.2 to 12.3%. Consequently, European studies showed the highest and the lowest adolescent problem gambling prevalence rate. Therefore, in the next section, a more detailed overview about adolescent gambling and problem gambling in the European continent will be presented.

**Table 1.** Overview of adolescent gambling prevalence studies across the world

North America

Country	Study	Measure	Sample characteristic	Response rate	Gambling prevalence	Problem Gambling prevalence	Legal age to gamble
Canada	Huang & Boyer (2007)	CPGI	National, 5,666 youth aged 15- 24 years that completed a survey using computer assisting interviews	77%	61.35% (past year)	<u>CPGI:</u> Problem gambling (3+): 2.2% (past-year prevalence)	18 years for Alberta, Manitoba, Quebec and 19 years for other states
USA	Welte et al. (2008)	SOGS -RA and DIS	National, 2274 youth aged 14- 21 years, who were surveyed by telephone	Not reported	68% (past year prevalence)	<u>SOGS-RA:</u> Problem gambling (4+): 2.1% (past-year prevalence) <u>DIS:</u> Problem gambling (+3): 2.2%, pathological (+4):0.4%; Combined rate: 2.6% (past-year prevalence)	From 12 to 21 years depending on states and gambling activities

South America

<b>Country</b>	<b>Study</b>	<b>Measures used</b>	<b>Sample characteristics</b>	<b>Response rate</b>	<b>Gambling prevalence</b>	<b>Problem Gambling prevalence</b>	<b>Legal age to gamble</b>
Brazil	Spritzer et al. (2011)	DSM-IV-J	661 with adolescents aged 14–17 years (these participants were a sub-sample of the general population), who were interviewed face-to-face	66.4 and 81% for the adolescent sub-sample	6.9% (no specific time frame is provided)	<u>DSM-IV-J</u> Problem gambling (+2): 1.6% (lifetime prevalence)	18 years

Asia

Country	Study	Measures used	Sample characteristics	Response rate	Gambling prevalence	Problem Gambling prevalence	Legal age to gamble
Hong Kong	Hsu et al. (2014)	DSM-IV-MR-J	926 youth aged 12-20 years, who completed the survey in the class	84.5%	46.5% (past-year)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 0.9% (past-year prevalence)	18 years

Australasia

Country	Study	Measures used	Sample characteristics	Response rate	Gambling prevalence	Problem Gambling prevalence	Legal age to gamble
Australia	Delfabbro & Thrupp (2003)	DSM-IV-J	South Australia, 505 youth aged 15-17, who completed the survey in the class	Not reported	47.8% (past-year)	<u>DSM-IV-J:</u> Problem gambling (4+): 3.5% (past-year prevalence)	18 years for most of gambling activities and 16 years for lotteries in some states
	Delfabbro et al. (2005)	DSM-IV-J and VGS	ACT region, 926 young people aged 11-19 years, who completed a survey in the class	Not reported	70.4% (past-year)	<u>DSM-IV-J:</u> Problem gambling (4+): 4.4% (past-year prevalence) <u>VGS:</u> Problem gambling (21+): 3.3%	

							(no information regarding time frame is provided)
	Lambos, Delfabbro & Pugglies (2007) a)	DSM-IV-J	South Australia, 2669 young people aged 13-17 years, who completed the survey in the class	Not reported	56.3% (past-year)	<u>DSM-IV-J:</u> Problem gambling (4+): 2.4% (past-year prevalence)	
	Delfabbro & King (2011)	DSM-IV-J	Darwin metropolitan area, 1107 aged 14-18 years, who completed the survey in the class	Not reported	50.8% (past-year prevalence for participants aged less than 18 years of age)	<u>DSM-IV-J:</u> Problem gambling (4+): 0.2% (past-year prevalence)	
New Zealand	Rossen (2008) a)	DSM-IV-MR-J	2,005 youth aged 11-21 years in the Upper North Island, who completed the survey in the class	Not reported	65.4% (past-year)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 3.8% (past-year prevalence)	18 years for most gambling activities and 20 years to enter a casino

<sup>a</sup> Non peer-reviewed paper



Europe

Country	Study	Measures used	Sample characteristics	Response rate	Gambling prevalence	Problem Gambling prevalence	Legal age to gamble
Albania	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD, 3189 students aged 16 years, who completed the survey in the class	90%	Not reported	<u>Lie/Bet</u> : Probable problem gambling (score of 2): 5.3% (lifetime prevalence)	18 years
Croatia	Dodig (2013)	CAGI	1,948 students aged 14-20 years from Zagreb, Osijek, Rijeka, and Split, who completed the survey in the class	Not reported	Not reported	<u>CAGI</u> : Problem gambling (6+): 12.3% (past three months prevalence)	18 years
Cyprus	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD, 4,243 students aged 16 years, who completed the survey in the class	Not reported	Not reported	<u>Lie/Bet</u> : Probable problematic gambling (score 2): 4.4% (lifetime prevalence)	18 years

Denmark	Kristiansen & Jensen (2014)	SOGS-RA	National, 2,223 adolescents aged 11-17 years, who completed the survey in the class	91%	70.1% (past-year)	<u>SOGS-RA:</u> Problem gambling: 1.3% (past-year prevalence)	18 years for casinos, slot machines and Internet, and 16 years for other kinds of gambling
	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD, 2181 students aged 16 years, who completed the survey in the class	89%	Not reported	<u>Lie/Bet:</u> Probable problem gambling (score 2): 1.6% (lifetime prevalence)	
Finland	Ilkas & Aho (2006)	SOGS-RA	5,000 adolescents aged 12-17 years	Not reported	52% (past-year)	<u>SOGS-RA:</u> Problem gambling (5+): 1.3% (past-year prevalence)	18 years
	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD, 3,744 students aged 16 years, who completed the survey in the class	90%	Not reported	<u>Lie/Bet:</u> Probable problem gambling (score 2): 4.8% (lifetime prevalence)	

Germany	Hurrelmann et al. (2003)	DSM-IV-MR-J	Regional, 5,009 adolescents aged 13-19 years from Federal State of North Rhine-Westphalia	d)	39.9% (past-year)	<u>DSM-IV-MR-J:</u> Problem gambling: 2.96% (past-year prevalence)	18 years
	Duven et al. (2011); Hayer (2014)	DSM-IV-MR-J	Regional, 3,967 students aged 12-18 years from Rhineland-Palatinate	d)	41.2% (past-year)	<u>DSM-IV-MR-J:</u> Problem gambling: 2.2% (past-year prevalence)	
Great Britain	Ashworth & Doyle (2000) <sup>a</sup>	DSM-IV-MR-J	9,529 adolescents aged 12-15 years from England and Wales, who completed the survey in the class	40% (school response rate)	34% (past seven days)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 5.4% (past-year prevalence)	16 years for lotteries and scratchcards and 18 years for other gambling activities
	Griffiths & Wood (2007); Griffiths (2008b)	DSM-IV-MR-J	National, 8,017 adolescents aged 12-15 years, who completed the	26% (school response rate)	73% (lifetime)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 3.5% (past-year prevalence)	

		survey in the class					
	Forrest & McHale (2012)	DSM-IV-MR-J	National, 8,958 aged 11-15 years, who completed the survey in the class	22% (school response rate)	21% (past seven days)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 1.9% (past-year prevalence)	
	Ipsos MORI (2014) a)	DSM-IV-MR-J	2,796 students aged 11-16 years from England and Wales, who completed the survey in the class	20% (school response rate)	16% (past seven days among people aged 11-15 years)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 0.8% (past-year prevalence)	
United Kingdom	Molinaro et al. (2014)	DSM-IV-MR-J	National data from ESPAD, 1,712 students aged 16 years, who completed the survey in the class	81%	Not reported	<u>Lie/Bet:</u> Probable problem gambling (score 2): 2.2% (lifetime prevalence)	
Iceland	Olason et al. (2006a)	SOGS-RA and DSM-IV-MR-J	Reykjavik and Akureyri region, 750 adolescents aged 16-18	Not reported	79.1% (past-year)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 2% <u>SOGS-RA:</u>	18 years

			years, who completed the survey in the class			Problem gambling (4+): 2.7% (past-year prevalence)	
	Olason et al. (2006b)	SOGS-RA and DSM-IV-MR-J	Reykjavík region, 3,511 adolescents aged 13-15 years, who completed the survey in the class	84%	70% (past-year)	<u>DSM-IV-MR-J:</u> Problem gambling (4+):1.9% <u>SOGS-RA:</u> Problem gambling (4+): 2.8% (past-year prevalence rates)	
	Olason et al. (2011)	DSM-IV-MR-J	Hafnarfjörður region, 1,537 adolescents aged 13-18 years, who completed the survey in the class	81.4%	56.6% (past-year)	<u>DSM-IV-MR-J:</u> Problem gambling (4+): 2.2% (past-year prevalence)	
Italy	Bastiani et al. (2011)	CPGI-short form	National, 1,241 youth aged 15-24 years derived from the ISPAD survey, who completed an	35%	35.7% (past-year)	<u>CPGI:</u> Problem gambling (3+): 2.3% (past-year prevalence)	18 years

		anonymous postal survey					
	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD, 4837 students aged 16 years, who completed the survey in the class	Not reported b)	Not reported	<u>Lie/Bet:</u> Probable problem gambling (score 2): 2.6% (lifetime prevalence)	
Lithuania	Skokauskas and Satkeviciute (2007)	SOGS-RA and DSM-IV-MR-J	Kaunas city, 835 youth aged 10-18 years, who completed the survey in the class	96%	82.7% (lifetime)	<u>SOGS-RA:</u> Problem gambling: 5.2% (past-year prevalence) <u>DSM-IV-MR-J:</u> Problem gambling (4+): 4.2% (past-year prevalence)	21 years for casino operated games and 18 years for other gambling activities.
	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD, 2,476 students aged 16 years, who completed the survey in the class	89%	Not reported	<u>Lie/Bet:</u> Probable problem gambling (score 2): 4.2% (lifetime prevalence)	There is no legal prohibition for lotteries

Norway	Johansson & Göttestam (2003)	DSM-IV	National, 3,237 adolescents aged 12–18 years, who completed a telephone and postal interview	45.2%	24.9% (past seven days)	<u>DSM-IV</u> Problem gambling (+3): 3.46%; pathological gambling (+5): 1.76%; Combined rate: 5.2% (lifetime prevalence)	18 years
	Molde et al. (2009)	DSM-IV subscale of Massachusetts Adolescent Gambling Screen, (MAGS)	1,351 students aged 16-19 years from West Norway, who completed an online survey	69.8%	Not reported	<u>DSM-IV:</u> Problem gambling (3-4.5): 1.9% Pathological gambling (5+): 2.5% Combined rate: 4.4% (past-year prevalence)	
	Rossow and Molde (2006)	Lie/Bet and SOGS-RA	National, 20,703 students aged 13 to 19 years, who completed the survey in the class,	80.2%	74.4% (past-year)	<u>SOGS-RA:</u> Problem gambling: (3-4): 2.5% (past -year prevalence) <u>Lie/Bet:</u> Problem gambling (2 items): 3.5% (lifetime prevalence)	
	Rossow et al. (2013) (study conducted before the ban of slot	SOGS-RA and Lie/Bet	National, 4,912 adolescents aged 13-18 years, who completed the	85.7%	69.3% (past-year)	<u>SOGS-RA:</u> Problem gambling (4+): 2.3% (past-year prevalence) <u>Lie/Bet:</u> Problem gambling (2): 3% (lifetime prevalence)	

	machines in the country)		survey in the class				
	Rossow et al. (2013) (study conducted after the ban of slot machines in the country)	SOGS-RA and Lie/Bet	National, 3,855 adolescents aged 13-18 years, who completed the survey in the class	77.7%	67% (past- year)	<u>SOGS-RA:</u> Problem gambling (4+): 3.1% (past-year prevalence) <u>Lie/Bet:</u> Problem gambling (2): 3.4% (lifetime prevalence)	
	Hanss et al. (2015)	PGSI	National, 2,059 adolescents aged 17 years, who completed a postal survey	70.4%	26.1% (past- month)	<u>PGSI:</u> Problem gambling (8+): 0.2% (past-year prevalence)	
Romania	Lupu et al. (2002)	GA-20	Cluj, Salaj, and Bacau regions, 500 adolescents aged 14-19 years, who	e)	82 (lifetime)	<u>GA-20:</u> Problem gambling (7+): 6.8% (lifetime prevalence)	18 years



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			completed the survey in the class				
	Lupu & Todirita (2013)	GA-20	Cluj-Napoca and Harghita counties, 1,032 adolescents aged 11-19 years, who completed the survey in the class	Not reported	Not reported	<u>GA 20:</u> Pathological gambling (7+): 3.48% (lifetime prevalence)	
	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD, 2,770 students aged 16 years, who completed the survey in the class	Not reported b)	Not reported	<u>Lie/Bet:</u> Probable problem gambling (score 2): 4.9% (lifetime prevalence)	
Serbia	Molinaro et al. (2014)	Lie/Bet	National data from ESPAD survey, 6084 students aged 16 years, who completed the survey in the class	86%	Not reported	<u>Lie/Bet:</u> Probable problem gambling (score 2): 3.1% (lifetime prevalence)	18 years

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Spain	Becona (2001)	SOGS-RA	Galicia region, 2,790 youth aged 14-21 years, who completed a survey in the class	Not reported	Not reported	<u>SOGS-RA:</u> Problem gambling (4+): 5.6% (past-year prevalence)	18 years
	Miguez & Becona (2015)	SOGS-RA	Galicia region, 1,447 youth aged 11-16 years, who completed a survey in the class	92.4%	Not reported	<u>SOGS-RA:</u> Problem gambling (4+): 4.6% (past-year prevalence)	
Sweden	Froberg et al. (2015)	PGSI	National, 2,570 youth aged 16-24 years, who completed a telephone and postal survey	72.5%	Not reported	<u>PGSI:</u> Problem gambling (3-27): 4.2% (past-year prevalence)	18 years
Switzerland	Suris et al. (2011)	SOGS-RA	Canton of Neuchatel, 1,126 students aged 15-20 years who	28.4%	37.5% (past-year)	<u>SOGS-RA:</u> Problem gambling (4+): 1.3% (past-year prevalence)	18 years

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completed an  
online survey

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a Non-peer-reviewed papers

b) These studies were taken from the paper by Molinaro et al. (2014). This paper summarized probable problem gambling across nine European countries using data from ESPAD, and which did not indicate the response rates for each country. After analysing the ESPAD report in detail, it can be observed that student response rates were not available for Cyprus, Italy and Romania, and thus the response rates for these countries were not reported in the present review.

c) This study is published only in Finish. The information reported is based on a English abstract and in the review of Kristiansen and Jensen (2011) conducted among the Nordic countries, and thus it was not possible to obtain more specific information about the methodology, such as the modality of survey used and response rates.

d) These papers are only published in German and the information reported was based on Heyer (2014), and thus it was not possible to obtain more specific information concerning methodology, such as the modality of survey used and the response rates.

e) This paper was not fully available in academic databases and the information reported is based on its abstract, which did not contain more specific information about methodology, such as response rates.

### *Adolescent gambling and problem gambling in Europe*

The European Union appears to be moving towards a more continued expansion of gambling characterized by the legalization and liberalization of gambling markets over the past few decades (Kingma, 2008). This may put more young individuals at-risk of developing gambling-related problems, especially underage youth, and suggests the need to provide a full overview of the European continent.

Since it was proposed to provide a more detailed examination about gambling and problem gambling in each European country, the present review also includes some studies that were not included in the initial overview, such as studies that did not use a standardized measure to assess problem gambling (five studies) or studies that assessed problem gambling in the context of a specific mode of gambling, such as online gambling (two studies). Nonetheless, the criterion for excluding studies with less than 500 participants was maintained. In order to present a more in-depth analysis for each European country, other data from other studies such as a description about the most popular gambling activities, and demographics associated with problem gambling are included. However, there are 22 European countries where no empirical research into adolescent gambling and problem gambling has been carried out: Armenia, Andorra, Austria, Belarus, Bulgaria, Czech Republic, Estonia, France, Hungary, Ireland, Latvia, Liechtenstein, Macedonia, Montenegro, Monaco, The Netherlands, Poland, Portugal, Russia, Slovak Republic, Slovenia and Ukraine.

#### *Albania*

The data available for this country, is part of a wider study that examined adolescent problem gambling across nine European countries (Molinaro et al., 2014), using data from the 2011 European School Survey Project on Alcohol and Other Drugs (ESPAD) study. The Albanian sample comprised 3189 students aged 16 years. Molinaro et al. (2014) reported a probable problem gambling rate of 5.3% among Albanian youth according to the Lie/Bet Scale.

#### *Belgium*

As a part of a wider study of youth habits, Kinable (2006) conducted a study with 38,357 adolescents aged 12–18-years. Results showed that 40.1% of the respondents had gambled during their lifetime on at least one of those gambling activities. During the previous six years, participation rates on those gambling activities had been decreasing each year from 52.5% in 2001 to 42.2% in 2005. However, no information was provided for problem

gambling prevalence rates.

#### *Bosnia and Herzegovina*

A survey was conducted among 2370 secondary school students in the municipalities of Zenica and Kakanj, which included questions about the frequency of playing games of chance among students and their parents (Softic et al., 2013). No standardized instrument to assess problem gambling was applied. According to this survey, 6.9% reported that they often played games of chance, 35.4% claimed that they played them occasionally, and 57.7% never played any game. With respect to the type of gambling they had participated in, 29.2% of the students were involved in betting, 7.4% played lottery, and 0.9% played cards.

#### *Cyprus*

There are some data concerning adolescent gambling in Cyprus, as a part of a wider study that examined adolescent problem gambling across nine European countries (Molinaro et al., 2014), using data from the 2011 ESPAD study. The sample size of Cyprus was 4243 students aged 16 years and the prevalence of probable problem gambling was 4.4% using the Lie/Bet Scale (Molinaro et al., 2014). Another more recent study examined online gambling in Cyprus (Floros et al., 2015), using a sample of 2684 adolescent students aged 12–16 years. The students completed a survey that included questions on demographics, the DSM-IV-MR-J, Young's diagnostic questionnaire (YDQ), the Parental Bonding Instrument (PBI) and the Strengths and Difficulties Questionnaire (SDQ). The results indicated that 19.1% of the students reported having had some experience using the Internet to gamble online during the past 3 months. Moreover, 2.5% of the total sample and 13.8% of those who had gambling experience were considered addicted online gamblers as classified by the DSM-IV-MR-J. Online gambling was associated with significantly higher Internet Addiction scores, lower parental care, and higher parental overprotection. Individuals with serious conduct problems (as assessed using the SDQ questionnaire) were more likely to gamble.

#### *Croatia*

There is one Croatian study on adolescent gambling conducted by Dodig (2013), which used the CAGI, an instrument created specifically for assessing adolescent problem gambling (Tremblay et al., 2010). The sample comprised 1948 students aged between 14 and 20 years, from Zagreb, Osijek, Rijeka and Split. The results showed that 70.8% of the participants gambled socially with no gambling-related problems, 16.9% scored as low to moderate

problematic gamblers, and 12.3% satisfied the criteria for severe gambling-related problems. The findings showed that the proportion of gambling-related problems were more prevalent among young men. Significant predictors of gambling problems included the experience of winning a large amount of money, continuation of gambling after winning money, frequency of gambling, and specific motivations for gambling (“gambling for making me feel better”, “gambling to be better at gambling”, and “gambling for earning money”).

### *Denmark*

With respect to adolescent gambling, a national survey on gambling behaviour among Danish school adolescents aged 11-17 years was conducted by Kristiansen and Jensen (2014). The instrument used in this study was the SOGS-RA as well as a series of questions that asked about the types of gambling behaviour most engaged in, social networks, and cognitive perceptions. The results showed that 84% of the sample reported having gambled at least once in their lifetime, and 70.1% had gambled during the past year. The overall prevalence rate of problem gambling was 1.29% and 4.5% were considered at-risk gamblers. Boys were found to be more regular gamblers than girls, and older respondents reported more gambling problems, although this later relationship did not reach statistical significance (Kristiansen & Jensen, 2014). The three most popular gambling activities among male respondents were scratchcards, card games, and sports betting, whereas for females the most popular were scratchcards, lotto and card games.

In this study, problem gamblers participated in more different gambling activities than at-risk gamblers, who in turn participated in more activities than non-problem gamblers (Kristiansen & Jensen, 2014). The majority of respondents had never tried mobile phone gambling or online gambling. However, statistically significant relationships between mobile phone gambling, online gambling, and gambling severity were found. More specifically, at-risk gamblers and problem gamblers played via their mobile phones and on the Internet to a greater extent than non-problem gamblers (Kristiansen & Jensen, 2014). In addition, the most frequently reported reasons for engaging in gambling behaviours were to win money (47.6%), followed by fun/entertainment (45.8%), socialising with family and friends (41.8%), excitement (38.5%) and curiosity (26%). The reasons of gambling to escape problems and the inability to resist temptation were reported more frequently among the at-risk and problem gamblers than among the non-problem gamblers. It was also reported that problem and at-risk gamblers more often played with friends or alone than with parents

(Kristiansen & Jensen, 2014). For participants with no gambling problems, the most frequent gambling partners were family members, more specifically parents or grandparents (Kristiansen & Jensen, 2014).

Adolescent gambling in Denmark was also examined in a study that examined adolescent problem gambling across nine European countries (Molinaro et al., 2014), using data from the 2011 ESPAD study. Here, the Danish sample comprised 2,181 students aged 16 years and the prevalence rate of probable problematic gambling was 1.6% using the Lie/Bet scale (Molinaro et al., 2014).

### *Finland*

With regard to youth gambling, a study was conducted on behalf of the Finnish Ministry of Social Affairs and Health during 2006 (Ilkas & Aho, 2006). A total of 5000 12-17-year old youths were interviewed and gambling was assessed using the SOGR-RA. Moreover, it was estimated that the risk group for problem gambling included approximately 1.3% of all youths.

A more recent study was carried out by Raisamo, Halme, Murto and Lintonen (2013), and was part of the 2011 nationwide Adolescent Health and Lifestyle Survey (AHLS). The gambling questions focused on gambling behaviour and gambling-related harms experienced due to gambling, such as “conflicts with parents”, and “disruptions in school/work”. However, the survey did not use any standardised instrument to assess problem gambling. The sample comprised 4,566 adolescents aged 12-18 years old. This study reported that 44% of the sample had gambled during the past six months. Of the adolescents in the sample, 32% were identified as occasional gamblers (gambled a couple of times a month or less often), and 12% as frequent gamblers (gambled weekly and daily). In addition, the total number of harms experienced by adolescents during the past 6-month period as a consequence of their gambling was 2.1, and the corresponding rate for occasional gamblers was 1.9. The prevalence of gambling was significantly higher among boys than girls.

Furthermore, another representative study of Finnish adolescent gambling behaviour was derived from a wider study examining adolescent problem gambling across nine European countries (Molinaro et al., 2014) in the ESPAD study. According to this study, the Finnish

sample comprised 3,744 participants and the prevalence of probable problematic gambling using the Lie/Bet scale was 4.8% (Molinaro et al., 2014).

### *Germany*

There are a number of empirical studies examining adolescent gambling in Germany (see Hayer, 2014), but the majority of them are only available in the German language.

The first study was conducted by Hurrelmann et al., (2003) was part of the “Health Behavior in School-aged Children” (HBSC) project, in which a set of questions for assessing adolescent gambling behaviour were added. This study used the DSM-IV-MR-J to assess problem gambling. The findings of this study showed that 62% of the adolescent students admitted to having participated in some form of gambling, namely scratchcards and self-organized card games for money. With regard to problem gambling, 3% of the sample participants were classed as problem gamblers (Hurrelmann et al., 2003).

Another study conducted by Duven et al. (2011) with a sample of 3,967 students aged between 12 and 18 years found a lifetime gambling prevalence of 64.3% and a past year gambling prevalence of 41.2% (see Hayer, 2014). The problem gambling rate was 2.2% using the DSM-IV-MR-J (see Hayer, 2014).

A study conducted by Walther et al. (2012) with 2,553 vocational students aged between 12 and 25 years found a past year gambling prevalence to be 33.4%. Using the SOGS-RA, the problem gambling prevalence rate was 1.3% (see Hayer, 2014).

### *Great Britain*

With regard to adolescent gambling, much research has been conducted in the UK, and more than any other European country, probably due to the availability and accessibility of fruit machines that are spread around the country (Volberg et al., 2010; Griffiths, 2009). National youth prevalence surveys in Britain have been conducted since 1995 under the aegis of the Britain’s National Lottery Commission (NLC) (Forrest & McHale, 2012).

The first study published since 2000 was conducted between June and July 1999, using a representative sample of 9529 students aged 12–15 years (Ashworth & Doyle, 2000). The findings of this study showed that 47% of the students reported that they had ever gambled



on National Lottery scratchcards, 40% had gambled on the National Lottery Draw and 68% had gambled on fruit machines. Moreover, 5.4% of young individuals surveyed were classified as problem gamblers according to the DSM-IV-MR-J. Problem gamblers were more likely to be boys than girls (Ashworth & Doyle, 2000).

Another adolescent survey was carried out in 2006 by the Ipsos MORI, a leading market research company in the UK with the International Gaming Research Unit (Griffiths 2008b; Griffiths & Wood, 2007) using a representative sample of 8017 adolescents aged 12 to 15 years of age. The most popular gambling activities were fruit machines (54%), private bets (37%) and scratchcards (28%). The 2006 survey showed a prevalence of problem gambling of 3.5% (Griffiths & Wood, 2007). The results showed that problem gamblers were more likely to exhibit other potentially addictive behaviours (i.e., to have smoked cigarettes, drunk alcohol and taken illegal drugs in the past week).

Another adolescent survey, comprising 8,958 adolescents aged 11-15 years surveyed in 201 schools was conducted during late 2008 and 2009, found a problem gambling rate of 1.9%, as assessed by the DSM-IV-MR-J (Forrest & McHale, 2012). This number represented a decrease from that one observed in the previous adolescent survey. According to the 2009 survey, higher problem rates were found for smokers (6.5%), Asians (3.0%) and slot machine players (9.7%). The most popular gambling activity was slot machines, with 9% of the sample reporting playing them (Forrest & McHale, 2012).

More recently, another study was carried out by the Ipsos MORI Social Research Institute on behalf of the National Lottery Commission and explored the prevalence of underage gambling and the incidence of problem gambling within this age group. The sample comprised 2,796 students aged between 11 to 16 years from England and Wales. However, the report focused on students aged 11-15 years in order to better understand underage gambling behaviour (Ipsos MORI, 2014). The results indicated that 16% of students aged 11-15 years reported having gambled in the seven days prior to the survey. The most common forms of gambling were fruit machines (6%), placing a private bet (5%) or playing cards for money with friends (4%) and scratchcards (4%) (Ipsos MORI, 2014). In addition, only 2% of 11 to 15 year-olds had spent money on Lotto in the past week (Ipsos MORI, 2014). The proportion of young individuals who had played *any* gambling game in the past week was higher among 16 year-olds than all other ages (22%, compared with 18% of 11

year-olds; 15% of 12 year-olds; 16% of 13 year-olds; 16% of 14 year-olds; and 16% of 15 year-olds) (Ipsos MORI, 2014). The findings showed that 0.8% of all participants were identified as problem gamblers, using the DSM-IV-MR-J. For students aged 12–15 years, 0.7% were identified as problem gamblers, 1.2% as ‘at-risk’ gamblers, and 12.0% as social gamblers. Boys were more likely than girls to be classified as problem gamblers (1.1 and 0.2% respectively). In fact, these results showed a decrease in the number of problem gamblers, in comparison with the 2008/2009 survey. However, the authors claimed that any comparisons between surveys should be treated with caution as there were significant differences with regard to sample sizes, as well as the number of sessions per school (Ipsos MORI 2014).

Finally, another representative dataset concerning adolescent gambling was derived from the 2011 ESPAD study (Molinaro et al., 2014). The sample comprised 1712 students from the whole UK and the rate of probable problem gambling according to Lie/Bet Scale was 2.2%.

### *Greece*

There have been very few studies on adolescent gambling behaviour in Greece. To the best of this author’s knowledge, only one study (conducted in the Greek island of Kos) examining adolescent Internet gambling (Floros, Siomos, Fisoun & Geroukalis, 2013) has been conducted. In this study, the sample comprised 2017 students between 12 and 19 years of age. The DSM-IV-MR-J was used to assess problematic Internet gambling, and the Parental Bonding Instrument (PBI) was used to assess parental care and overprotection. The results indicated that 37.2% of adolescents reported having had some experience with Internet gambling, whereas 4.1% of the total participants were classified as problem gamblers (Floros et al., 2013). Parental care was associated with lower scores on the DSM-IVMR-J, whereas higher levels of overprotection were associated with higher scores (Floros et al., 2013).

### *Iceland*

With regard to adolescent gambling, a study was conducted in Iceland in 2003 that included a sample of 750 students aged 16–18 years (Olason et al., 2006a). Icelandic versions of DSM-IV-MR-J and SOGS-RA were employed. The results showed 96.5% reported having gambled at least once in their lifetime, 79.1% had gambled during the previous 12 months, and 10.4% had gambled at least once a week over the past year. Males were more likely to gamble on a regular basis than females. The most popular gambling activities in the 12

months prior to the survey were scratch tickets (53.7%), gambling machines (46.7%) and Lotto (30.4%). With regard to problem gambling, the DSM-IVMR-J identified 2.0% of the sample as problem gamblers and 3.2% as at-risk problem gamblers. The SOGS-RA identified 2.7% as problem gamblers with a further 4.4% at-risk for gambling problems (Olason et al., 2006a). Both instruments identified significant gender differences concerning gambling-related problems: females were less likely to be classed as problem gamblers and at-risk gamblers (Olason et al., 2006a).

Another study was conducted with 3511 adolescents aged 13–15 years in schools in Reykjavik (Olason et al., 2006b). The findings showed that 93% reported having gambled at least once in their lifetime, almost 70% had gambled during the previous 12 months, and 8% had gambled at least once a week for the preceding 12 months (Olason et al., 2006b). The most popular gambling activities in the 12 months prior to the survey were scratch tickets (48.2%), Electronic Gaming Machines (EGMs) (32.0%) and Lotto (28.1%). With regard to problem gambling, the DSM-IV-MR-J identified 1.9% as problem gamblers with 3.7% as at-risk problem gamblers, and 8% had gambled at least once a week for the preceding 12 months. The SOGS-RA identified 2.8% as problem gamblers with a further 4.1% at-risk for gambling problems. Boys had more gambling problems than girls. Further analysis showed that problem and at-risk gamblers were more likely than other gambling groups to report that their parents gambled (10% of problem gamblers and 5% of at-risk gamblers compared to only 2% of the social gamblers that reported that their parents gambled).

The most recent adolescent survey was conducted in the academic year 2007-2008, in which 1,537 students aged 13-18 participated (Olason et al., 2011). The students completed a measure for gambling frequency, and the DSM-IV-MR-J. The findings showed that 56.6% of the adolescents had gambled during the past year and 8.1% gambled regularly (at least once a week). Boys were more likely to gamble than girls in all gambling forms (both Internet and land-based) and more regularly. The most popular past year gambling activities among the entire adolescent sample were scratch tickets (27.1%), poker (22.3%) and EGMs (21.4%). With regard to Internet gambling, 24.3% reported wagering money and 4.1% did it at least on a weekly basis. The most popular forms of gambling on the Internet were casino type games on non-Icelandic websites (12.4%), Internet Lotto (8.7%) and sport pools (8.5%). The findings showed that 2.7% of the participants were at-risk gamblers and 2.2% were

problem gamblers. Problem gambling was more prevalent among boys (4.2% compared to 0.1% of females) and among adolescents aged 15-16 years (4.2%) compared to 13-14 years (0.7%) and 17-18 years (2.2%). With regard to problem gambling on the Internet, the prevalence of problem gambling among Internet gamblers (7.5%) was considerably higher than that obtained for the total sample (2.2%).

### *Italy*

Youth gambling in Italy has been examined via the Italian Population Survey on Alcohol and Drugs (IP SAD) 2007–2008 study, and comprises a sub-sample of individuals aged from 15 to 24 years old (Bastiani et al., 2011). The results showed that 35.7% reported gambling participation in the past 12 months, 26.5% scored as no-risk gamblers, 6.9% scored as low-risk gamblers, and 2.3% were moderate-risk or problem gambling. The findings showed that Italian youth, although gambling less than adults (35.7 vs. 45.3%), appear to have a higher prevalence of moderate risk or problem gambling (2.3 vs. 2.2%). Among this age group, male gender, primary educational level, and smoking more than ten cigarettes per day were more associated with moderate-risk and problem gambling (Bastiani et al., 2011).

Another representative study of Italian adolescent gambling behaviour was derived from the 2011 ESPAD study (Molinari et al., 2014). In this study, the Italian sample comprised 4837 participants and the rate of probable problematic gambling was 2.6% using the Lie/Bet Scale.

### *Lithuania*

A Lithuanian study on adolescent problem gambling behaviour was carried out in Kaunas, the second biggest Lithuanian city, with 835 adolescents, aged 10–18 years (Skokauskas & Satkeviciute, 2007). Problem gambling was assessed via two different screens (i.e., SOGS-RA and DSM-IV-MR-J). The results showed that the most popular gambling activities among all gamblers was TeleLotto (53.9%) followed by other lotteries (36.8%) and betting (9.8%). Based on the DSM-IV-MR-J, 4.2% of respondents were classed as problem gamblers, 9.1% classed as at-risk gamblers, 69.4% were classed as social gamblers, and 17.3% as non-gamblers. With respect to the reasons for gambling, the largest proportion of participants reported that gambling was mainly a form of enjoyment (49.1%), followed by the reasons “a chance to try luck” (44.6%), and “to win money” (34.1%). In fact, the reasons for gambling varied according to the severity of gambling (i.e., the reasons for winning money were less referred to by problem gamblers). Adolescent problem gamblers

in comparison with non-problem gamblers were more likely to engage on slot machines (51.4 vs. 8.1%) and cards (17.1 vs. 6.9%). Problem gamblers were found to be older (mean = 16.6 years), than at-risk (mean = 15 years) and social gamblers (mean = 14.5 years). Moreover, problem gamblers were more likely to be male (6.3%) than female (2.3%), and were significantly more likely to report that their parents gambled (80.1%), compared to social gamblers (12.8%). Furthermore, problem gamblers were more likely to engage in regular alcohol use (57.1%) than social gamblers (10.2%); and also more likely be involved in cigarette smoking (65.7%) than social gamblers (12.7%). Finally, 2.9% of problem gamblers reported using illegal drugs regularly as compared to 1.3% of social gamblers. With respect to academic factors, significantly more problem gamblers (34.3%) than social gamblers (6.9%) reported doing badly or very badly in school.

There are also data about adolescent gambling in Lithuania derived from the 2011 ESPAD study (Molinaro et al., 2014). The sample comprised 2476 participants and the rate of probable problem gambling using the Lie/Bet Scale was 4.2%.

### *Luxembourg*

A survey of gambling behaviours among high-school students was carried out by the Luxembourg Centre of Addiction Prevention (Centre de Prevention des Toxicomanies). The study did not assess problem gambling among the students, but examined the most common gambling activities, and how frequently youth engaged in each form of gambling (Duscherer and Paulos 2014). Data from 3496 students indicated that the most frequent gambling activities cited by youth were scratchcards (71%), card games (58.4%) and slot machines (51.8%). Apart from slot machine gambling where there were no gender differences (51.7% males vs. 52% females), boys engaged more frequently in all gambling activities (Duscherer & Paulos 2014). However, the authors hypothesized that this small difference between males and females for slot machines may have been due to the wording used in the German survey, as the German word “Spielautomat” may have been interpreted as a video game device (Duscherer & Paulos, 2014).

### *Norway*

In assessing adolescent gambling, some Norwegian school surveys have been carried out (e.g., Johansson & Götestam, 2003; Rossow et al., 2013).

The first survey was carried out by Johansson and Gotestam (2003) with a sample of 3,237 participants aged 12-18 years. The study indicated that 82.4% of adolescents had gambled in their lifetime and 24.9% gambled at least once a week. The results also showed that 1.76% of the sample were pathological gamblers as assessed using the DSM-IV and 3.46% were at-risk gamblers (Johansson & Gotestam, 2003). Males were more likely to be classified as pathological gamblers than females (2.79% males vs. 0.69% females) (Johansson & Gotestam, 2003).

Another youth survey was conducted, with a sample of 1351 students aged 16–19 years (Molde et al., 2009). The instrument used to assess problem gambling was the DSM-IV subscale of the Massachusetts Adolescent Gambling Screen (MAGS). The prevalence of problem gambling was 1.9% (score 3-4.5) and the prevalence of pathological gambling was 2.5% (score 5). The combined prevalence of problem and pathological gambling was 4.4%. A multiple logistic regression analysis showed that gender, depression, alcohol abuse, and dissociation were related to problem and pathological gambling.

In September 2004, an adolescent survey was carried out with students aged 13–19 years from all geographical regions in Norway, during regular school classes (Rossow & Molde 2006). The sample comprised 20,703 participants and the Lie/Bet Scale and the SOGS-RA were used to assess problem gambling (Rossow & Molde, 2006). Results indicated that a total of 74.4% of the students reported they had gambled at least once during the preceding year. The most reported gambling activities were scratch lottery tickets (55.5%) and slot machines (50.2%). The problem rate was 2.5% using the SOGS-RA and 3.5% using the Lie/Bet Scale (score 2). Problem gambling prevalence rates were higher among boys, among those who did not live with both parents, and among those with an Islamic or other non-Christian religious affiliation (Rossow & Molde, 2006).

Another survey before (2006) and after (2008) the removal of slot machines was designed to assess the possible impact of this intervention (Rossow et al., 2013). The analysis was carried out only in students from the same schools in both survey years. The students who participated were aged between 13 and 18 years. The samples comprised 4912 students in 2006 and 3855 students in 2008. To assess problem gambling, three instruments were used: SOGS, Lie/Bet Scale, and a single question about self-perceived gambling problems – “Do you think that you have problems due to your gambling?” When comparing the prevalence

of gambling behaviour reported by respondents in 2006 and 2008, the weekly prevalence of the majority of gambling activities decreased from 2006 to 2008, except on internet poker (3.0% in 2006 and 3.8% in 2008). With regard to the prevalence of at-risk and problem gambling between 2006 and 2008, there was a statistically significant decrease in the prevalence of self-perceived gambling problems (3.6% in 2006 and 2.3% in 2008). However, there was no statistically significant difference in the prevalence of the Lie/Bet Scale and there was a statistically significantly higher prevalence of SOGS-RA (2.3% in 2006 and 3.1% in 2008).

More recently, a prevalence survey with 2055 Norwegian adolescents aged 17 years reported a problem gambling prevalence of 0.2% using the PGSI (Hanss et al., 2015). Here, being male, living without both parents, and being of non-Norwegian ethnicity, were more associated with problem gambling.

### *Romania*

The first Romanian study conducted by Lupu, Onaca and Lupu (2002) was carried out among 500 school teenagers from three different Romanian districts (Cluj, Salaj and Bacau) and the GA-20 was used to assess problem gambling. The findings of this study indicated that 6.8% of adolescents were problem gamblers, with males being more likely to be problem gamblers (82.4%) than females (17.6%). In addition, the most frequent gambling activities were pool betting (55.9%), poker (35.3%), and bingo (32.4%).

The most recent adolescent gambling study was carried out by Lupu and Todirita (2013), with 1032 adolescents aged 11–19 years in the counties of Cluj-Napoca and Harghita. The GA-20 was again used to assess problem gambling. The results showed that 73% gambled at a recreational level and 3.5% at a pathological level. Males were more likely to be pathological gamblers than females. The typical onset of gambling was at the age of 15 years and the mean age of pathological gamblers was 16.5 years (Lupu & Todirita, 2013). The games most played by pathological gamblers were sports betting/slot machines (36% of players) and lotto/internet casino/pool bets (25%). Moreover, pathological gambling was associated with alcohol (66.7%), illegal drugs (13.9%), legal drugs (19.4%), and smoking cigarettes (16.7%).

Another representative dataset concerning adolescent gambling was derived from the 2011 ESPAD study (Molinaro et al., 2014). The Romanian sample comprised 2770 students aged 16 years and the rate of probable problem gambling was 4.9% using the Lie/Bet Scale.

### *Serbia*

There are some data available for this country, derived from the 2011 ESPAD Study (Molinaro et al., 2014). The Serbian sample comprised 6084 participants and the probable problem gambling rate was 3.1% (scoring 2 on the Lie/Bet Scale).

### *Spain*

A study carried out by Becona, Míguez and Vázquez (2001) was conducted with a representative sample of 2790 students from Galicia aged between 14 and 21 years. The SOGS-RA was used to assess problem gambling. The findings of this study showed that 86.1% were non-problem gamblers, whereas 8.2% were at-risk gamblers, and 5.6% were problem gamblers during the past year. Within the group of problem gamblers, 10.4% were boys and 1.6% were girls. With regard to age, 6% of problem gamblers had between 14 and 17 years and 4.6% of problem gamblers were aged between 18 and 21 years old. In addition, 12.7% of problem gamblers had parents who gambled excessively, whereas only 1.6% of non-gamblers had parents who gambled excessively (Becona et al., 2001).

A more recent study was carried out by Míguez and Becona (2015), with 1447 students from Galicia (aged 11–16 years), who completed an anonymous survey in the class. The study found a problem gambling rate of 4.6% using the SOGS-RA. This study also showed a clear relationship between a greater involvement in gambling, cigarette smoking, and alcohol use.

### *Sweden*

Froberg et al. (2015) conducted a study, using nationally representative data from Swedish Longitudinal Gambling Study, in order to estimate the incidence of a first episode of problem gambling among Swedish youth aged 16-24 years. Participants were first interviewed (from October 2008 to April 2009), and in a second wave (December 2009 to May 2010) participants were approached for a follow-up interview. At baseline, participants were distributed in three groups: baseline problem gamblers (defined as having a score of 3-27 in the PGSI in the past 12 months); baseline previous problem gamblers (defined as participants without problem gambling in the past 12 months, but with problem gambling previously in



life measured by the SOGS-R); and baseline never problem gamblers (participants who never had a gambling problem, that is, participants with a score of 0-2 in the PGSI and in the SOGS-R). Among 2,318 of youth aged 16–24 years, who were baseline never problem gamblers, 2.3% had a first episode of problem gambling measured by the PGSI at the follow-up. Furthermore, the incidence proportion of a first episode of problem gambling was higher among males (3.2%) than females (1.1%), as well as among individuals who were born outside of Sweden (4.3% for those born in Europe and 3.7% for those born elsewhere vs. 2.1% for those who were born in Sweden). In addition, the prevalence of problem gambling at the follow-up among all individuals aged 16–24 years (and not only among those who were never baseline problem gamblers) was 4.2%.

### *Switzerland*

With regard to adolescent gambling, a prevalence study was conducted using data drawn from the 2007 Swiss Health Survey (Luder, Berchtold, Akre, Michau & Suris, 2010). For the study, only participants aged 15 to 24 years were considered and thus data on gambling behaviour were available for 1,116 students. These students were surveyed about gambling frequency, as well as socio-demographic characteristics, substance abuse, mental health and social support (Luder et al., 2010). However, no standardized measure of problem gambling was used in the study. The results showed that 48.3% of youth were engaged in some gambling activity during the previous year, whereas 34.8% were classified as occasional gamblers (gambled <52 times/year) and 13.5% were classified as frequent gamblers (gambled >52 times/year). In addition, frequent gamblers had higher odds of being daily cigarette smokers (Luder et al., 2010). This study, in spite being based on a nationally representative sample of Swiss youth, had questions on gambling behaviour embedded within a more general questionnaire that covered many topics and did not use specific instruments to assess problem gambling.

A regional study that also assessed adolescent problem gambling was conducted in the canton of Neuchatel (Suris, Akre, Petzold, Berchtold & Simon, 2011). This study comprised a sample of 1126 students aged 15–20 years, who participated in an online survey. The French version of the SOGS-RA was used to assess problem gambling. The results showed that 37.5% of youth had gambled during the last 12 months. According to this study, 31.9% were non-problem gamblers, whereas 4.3% were at-risk gamblers, and 1.3% were problem gamblers. The group of at-risk/problem gamblers was predominantly boys (82%). The

proportion of these gamblers increased with age and decreased with socioeconomic level. The types of gambling activities most engaged by youth were lotteries (80.2%), gambling on casinos and on the Internet (55.5%). It was also reported that 44.2% of underage individuals reported to gamble on casinos and 62.5% reported gambling on the Internet. In addition, the results showed a significant association between being at-risk/problem gamblers and the problematic use of Internet, as well as the use of psychoactive substances, such as tobacco, alcohol, cannabis and other illegal drugs.

### **Summary of the prevalence studies**

Several conclusions can be drawn from this review of adolescent prevalence studies. Firstly, from a methodological perspective, school-based surveys were the primary modality to collect data for adolescent prevalence surveys. However, all the data are self-report, and are subject to many well-known biases, such as the reliability of memory, social desirability and the honesty of the responses given. Secondly, some variations in the sample sizes can be found. In fact, some studies used local or regional samples, whereas other studies used national samples, which allow for a better generalizability to the general population. Thirdly, some instruments used a past-year timeframe, whereas others used a lifetime perspective. Logically, a lifetime perspective will produce higher problem gambling prevalence rates. Fourthly, it should be noted that different studies used different screening instruments to assess problem gambling, which makes comparing prevalence rates across countries more difficult. In addition, the majority of gambling instruments, despite being designed for adolescents, are developments of gambling screens that were originally designed to assess gambling problems among adults, with wording and content adapted to be more suitable for adolescent populations. Only the study conducted in Croatia (i.e., Dodig, 2013) used the CAGI, an instrument originally developed for use with adolescents. However, pending a better-validated problem gambling instrument for adolescents, these instruments are likely to continue to be viewed as the best approximations for the assessment of problem gambling among adolescents. The lifetime worldwide problem gambling prevalence rates ranged from 1.6 to 5.6%. The lowest problem gambling rates were found in Brazil and Denmark and the highest was found in Albania. The low prevalence rates found in Brazil and Denmark could be related to the gambling legislation and access to gambling venues in these countries. Looking at the European continent, the lifetime problem gambling prevalence rates ranged from 1.6 to 5.6%, with Albania again reporting the highest problem gambling prevalence rate (see Molinaro et al., 2014). The highest rate found in Albania could be related to the

effect of living in Eastern and Balkan countries, where welfare services and health benefits are limited, and which may have a negative impact on adolescent health (Holstein et al., 2009). Such a finding suggests that more research on youth gambling should be carried out in this country, in order to examine the specific factors in this particular context that may influence gambling and problem gambling behaviour.

The past-year adolescent gambling prevalence rates across the world ranged from 0.2 to 5.6%, with Spain presenting the highest prevalence rate (although this rate was not found in the most recent adolescent study of this country). The lowest prevalence rate of 0.2% was found in Australia and Norway. The low prevalence rate found in the Australian study conducted in the Darwin metropolitan area might be due to a selective under-sampling of young individuals with lower school attendance or levels of literacy, as suggested by the authors (i.e., Delfabbro & King, 2011). In Europe, the adolescent gambling prevalence rates ranged from 0.2% (in Norway) to 5.6% (Spain). The high prevalence rate in Spain may be due to the existence of different types of slot machines that were easily accessible in the country at the time the study was conducted (see Becona et al., 2001). However, all the Spanish studies are regional and therefore national studies should be conducted. The lowest rate found in Norway could be due to a possible effect of recent changes in the gambling landscape, such as the removal of slot machines in 2007 and the reintroduction of new slot machines with less addictive potential in the Autumn of 2008 (see Rossow et al., 2013). Another noteworthy aspect is a high prevalence rate found in Croatia (12.3%) with a timeframe of three months. This finding might be due to the instrument used (i.e., CAGI), which has not been used in any other study. It may also be explained by the easy accessibility of gambling in Croatia (see Dodig, 2013) and highlights the need to conduct more research in this country with instruments used in other studies. Overall, these findings suggest some variations in youth problem gambling prevalence rates across different countries and show the need to encourage more collaboration between researchers from different countries using the same instrumentation and employing the same cut-offs, in order to improve comparability between national studies, and to understand the effect of different legislation in youth gambling patterns.

Notwithstanding these variations, there were also consistent results in demographics: many European countries showed that youth problem gambling is more likely to occur among males (Johansson & Gotestam, 2003; Ashworth & Doyle, 2000; Griffiths & Wood, 2007;

Skokauskas & Satkeviciute, 2007; Kristiansen & Jensen, 2014; Dodig, 2013; Raisamo et al., 2013; Suris et al., 2011; Hanss et al., 2015; Froberg et al., 2015; Bastiani et al., 2011; Becona et al., 2001; Olason et al., 2011); among those individuals who belong to an ethnic minority (Hanss et al., 2015; Froberg et al., 2015; Forrest & McHale, 2012; Griffiths, 2008b); among those who have parents who gambled (Becona et al., 2001; Forrest & McHale, 2012; Olason et al., 2006b); and who did not live with both parents (Rossow & Molde, 2006; Hanss et al., 2015); and among older adolescents (Skokauskas & Satkeviciute, 2007; Suris et al., 2011; Kristiansen & Jensen, 2014). Problem gamblers were also more likely to gamble on the Internet (Olason et al., 2011; Kristiansen & Jensen, 2014), which could be explained by some characteristics of this gambling mode, such as its accessibility, affordability, convenience and anonymity. In fact, Internet gambling may serve as a good modality for young individuals engage in gambling activities without age verifications and parental supervision, and therefore may explain the vulnerability of this age group to modern and remote forms of gambling, as some authors had already suggested (e.g., Delfabbro et al., 2009).

Overall, the most frequent motivations reported by adolescent problem gamblers were gambling to escape and the inability to resist temptation (Skokauskas & Satkeviciute, 2007; Kristiansen & Jensen, 2014). A noteworthy aspect was that gambling for winning money was a motivation less mentioned by adolescent problem gamblers in comparison with non-problematic adolescent gamblers. This finding may be understood in light of existing gambling theories, namely the need-state and dispositional theories of gambling (see Chapter 1), which claims that individuals gamble in order to escape from problems and unpleasant feelings, and that problem gambling can be viewed as a maladaptive coping strategy used to handle stress and/or depression (Blaszczynski & McConaghy, 1989). In fact, according to this theory, the excitement of gambling could also be independent of individuals's desire to win money (Walker, 1992).

Significant predictors of problem gambling include the experience of winning a large amount of money early in adolescents' playing career, and being of lower socioeconomic status (Dodig, 2013; Suris et al., 2011). Furthermore, most empirical research on adolescent gambling in Europe has demonstrated a clear relationship between gambling behaviour and substance abuse (Molde et al., 2009; Luder et al., 2010; Bastiani et al., 2011; Miguez & Becona, 2015; Lupu & Todirita, 2013; Skokauskas & Satkeviciute, 2007; Griffiths & Wood, 2007). This finding suggests that, as it was already highlighted in the previous chapter,

gambling is maintained by many of the same processes inherent in these other addictions, which may lend some support to the theory that gambling is also a biopsychosocial addiction, like alcoholism and substance dependence (Walker, 1992; Griffiths, 1995). However, as it was also pointed out in Chapter 1, it should bear in mind that although there are some biologically-related factors that can account for gambling behaviour (e.g., tolerance, withdraw and craving), these factors fail to explain some of the other findings observed in the present review, for example, the variations in motivations to gamble and why some gambling activities appear to be more “addictive than others” (Griffiths & Delfabbro, 2001).

In fact, the most popular youth gambling activities tended to be lotteries, scratchcards, card games, and slot machines (Duscherer & Paulos, 2014; Rossow & Molde, 2006; Ashworth & Doyle, 2000; Olason et al., 2011; Griffiths 2008b; Softic et al., 2013). In addition, problem gamblers participated in more different gambling activities than non-problem gamblers (Kristiansen & Jensen, 2014). The games most played by problem gamblers were slot machines (Forrest & McHale, 2012), card games, and sports betting (Skokauskas & Satkeviciute, 2007; Lupu & Todirita, 2013). The gambling activities that appeared to be the most problematic included those that involve high event frequencies and short interval between stake and payout (such as slot machines), and confirms previous studies that have identified slot machines as one of the most problematic types of gambling worldwide (Abbott 2001; Parke & Griffiths, 2006). The structural characteristics of slot machines, such as the high event frequencies, immediacy of rewards, and short interval between stake and payout, might facilitate the maintenance of the behaviour by means of operant conditioning, as it was also stated in Chapter 1.

In addition, such machines are highly accessible and available in many European countries, as they are found in the majority of bars, restaurants and amusement arcades, and can be played with relatively little money (Choliz, 2010).

Overall, the present review supports the findings of other reviews with regard to demographics, and behavioural characteristics that are more associated with youth gambling involvement. In addition, other reviews also highlight the fact that different methodological procedures and different instruments with different cut-offs can generate differences in problem gambling prevalence rates between studies (e.g., Kristiansen & Jensen 2011; Volberg et al., 2010). Notwithstanding these similarities, this review expands and updates

the previous reviews, which are now outdated, and tried to overcome the English publication bias by providing youth problem gambling prevalence rates of some countries which are only available in their native languages (e.g., Spain, Switzerland). Moreover, unlike other reviews, the present review provided a country-by-country analysis of adolescent gambling across a whole continent (i.e., Europe). This goal is particularly relevant because such an overview can encourage the development of a more common European prevention strategy that could reach a larger number of young individuals.

## **Conclusion**

The present chapter had shown that adolescents and young adults are a vulnerable group for the development of gambling-related problems, due to several reasons. Firstly, adolescence and emerging adulthood are transitional periods characterized by risk taking behaviours more generally. Secondly, the current generation of youth is the first to grow up in a society where gambling is generally accepted, heavily available, and widely promoted, and where new gambling opportunities had emerged through the Internet. This might facilitate youth engagement in this behaviour without a careful examination of its risks and hazards.

In addition, this chapter revealed that although there is an age limit of 18 years to start gambling in many countries, adolescents do engage in gambling and develop gambling problems before this age. Moreover, the review conducted on adolescent gambling prevalence surveys across the world (with a more detailed picture of adolescent gambling research in Europe) showed that in Portugal no empirical research on youth gambling has been carried out, in spite of evidence suggesting that gambling is growing in the country, and that young people also constitute a vulnerable age group for the development of gambling-related problems (Lopes, 2009). Therefore, the present thesis attempts to fill this gap, by providing a first characterization of youth gambling in Portugal.

In addition, this thesis intends to describe youth gambling behaviour in two different countries (Portugal and England) and therefore address the lack of cross-cultural research that exists in the field. In fact, there are some reasons to assume that the prevalence rates of gambling will be different for these two countries. Firstly, the gambling landscape is different, because in England slot machines are widely available in family leisure centres and seaside arcades, which can be legally played by children and adolescents, and therefore can increase the number of legally accessible gambling opportunities for this age group.

Furthermore, the legal age to start gambling is also different for these two countries. In Portugal there is an age limit of 18 years before individuals can legally gamble, whereas the legal age to gamble in England is 16 years for lotteries and scratchcards, and 18 years for all other gambling activities (apart from some types of slot machine in seaside arcades and family leisure centres where there is no age limit on gambling). The differences in legal gambling ages may have implications for the initiation of gambling habits, because when youth are presented with (and have access to) more gambling options, they are more likely to gamble more often, find a preferred form of gambling, which can increase the risk of developing gambling-related problems (Shead, Derevensky & Gupta, 2010). In fact, young people are different from adults due to their stage of physiological and psychological development, their inexperience, and their position in society (Arnett, 1992). They are more vulnerable to gambling-related harms, and the harms they experience are likely to have a large impact, both now and in the future. Therefore, it is important to identify the conditions, and to reduce the hazards, that might impair their ability to grow up safely. As gambling is considered a risky behaviour, which should be regarded primarily as an activity for adults (Ipsos MORI, 2014), and might impact youth's ability to mature without harm, priority should be given to protect young people from the rapidly developing risks of gambling and governments should limit their access to gambling. In countries where gambling is available to underage people, probably due to arguments that claim that historically, there are specific products which have always been available to under-18s in seaside arcades and elsewhere, and because there is no evidence that playing some gambling games, such as lotteries will result in any harm (Seabury & Wardle, 2014), it is crucial to carry out more research which examines the long-term impact of playing these games among underage people.

Youth gambling can have serious and devastating consequences, and can become a public health issue. Therefore, there is an urgent need for more research on this behaviour in order to further understand its predictors and to develop more effective social policies that can protect young individuals from gambling-related harms. However, in comparison with other risky behaviours that occur in youth, the research on youth gambling behaviour is still in its infancy, which highlights the importance of conducting more research on this topic. Therefore, knowledge of risk factors is required in order to advance our knowledge on this phenomenon as well to develop effective preventive actions. The next chapter will review some of these risk factors and will address some of the gaps in these factors in the current empirical gambling literature.

### **Chapter 3: Review of risk factors in youth gambling**

As noted in the previous chapter, knowledge of risk factors are required in order to advance the knowledge of youth problem gambling. In fact, the empirical foundation of preventive action and intervention efforts arises from research determining risk and protective factors. Risk factors are defined as conditions associated with an increased likelihood of a negative outcome (e.g., gambling problems). In turn, protective factors are those conditions that reduce the potential of developing symptoms of psychosocial maladjustment or moderate the effect of exposure to risk factors (Coie et al., 1993). However, before an overview of the most relevant risk factors, it should be noted that problem gambling is a multifaceted rather than an unitary phenomenon (Griffiths, 2005), and therefore many factors may come into play in various ways and at different levels to contribute to the emergence and maintenance of problem gambling behaviour.

As noted in Chapter 1, gambling is a highly complex behaviour, which is not likely to be explained by any single theory (Griffiths & Delfabbro, 2001). For instance, individuals can have a genetic predisposition for having a gambling problem, but through their development, there are many factors that can heavily influence the maintenance of this behaviour, such as the schedules of reinforcement, the escape qualities from unpleasant mood states of gambling and the cognitive bias, all of which have been explained by three general classes of theory (i.e., behaviourist theories, need-state models, and cognitive theories). Therefore, in the study of problem gambling behaviour, biological, psychological, and social factors are all relevant in the development of problematic levels of gambling (Sharpe, 2002). Most of the empirical studies conducted on youth problem gambling have examined individual, interpersonal, community, and societal factors, where the relationship between individuals and their environment is recognized (Shead, Derevensky & Gupta, 2010). As it was pointed out in Chapter 1, this thesis will adopt the biopsychosocial model, which posits that problem gambling develops through a complex interaction between personal attributes of the individual and exogenous stimuli in the environment (National Research Council, 1999; Williams, West, & Simpson, 2007).

Therefore, an overview of the most important risk factors noted in the literature is presented in this chapter. The categories of risk factors are presented using an ecological model, which addresses individual factors, followed by family factors, and macro-level factors.



## **Individual factors**

### *Demographics*

#### *Gender*

A consistent body of research has shown that gambling is predominantly a male activity, with significantly more boys engaging in gambling than girls (Donati, Chiesi & Primi, 2013; Spritzer et al., 2011; Olason et al., 2011). In addition, males are more likely to develop gambling-related problems (Kristiansen & Jensen, 2014; Hanss et al., 2015; Anagnostopoulos et al., 2017). Moreover, it has been found that boys start gambling at an earlier age (Dodig, 2013), and engage more often in gambling activities with high addictive potential, such as sports betting, betting on virtual races, and slot machines (Ricijas, Hundric, Huic, Kranzelic, 2016), which may help explain why boys are more prone to develop gambling problems than girls.

#### *Racial and ethnic groups*

As noted in the previous chapter, there is a growing body of evidence that suggests that adolescents from ethnic minority groups are more at-risk for developing gambling problems (Hanss et al., 2015; Froberg et al., 2015). For instance, Ellenbogen, Gupta and Derevensky (2007) conducted a study using a convenience sample of 1265 Quebec high school students in Canada and found that Allophone adolescents (neither French nor English being the primary language) had the highest rates of gambling frequency on a weekly basis and problem gambling. Moreover, Delfabbro, Lahn and Grabosky (2005) in a cross-sectional study with 926 adolescents found that young individuals from indigenous backgrounds tend to be more affected by problem gambling. More recently, Canale et al. (2017) with a representative sample of 20,791 Italian 15-years old children derived from the Health Behaviour in School Aged-Children data, found that first-generation immigrants (participants who were born outside of Italy) were significantly more at-risk to be problematic gamblers, in comparison with non-immigrants and second-generation immigrants. The findings of these studies suggest that immigrant students can experience a conflict created by juggling the demands of two different cultures, and an overall stress associated with the adaptation, which may foster the risk for engaging in risky and problematic behaviours, such as gambling.

## **Personality characteristics**

Personality is conceived as a set of dynamic, self-regulatory systems that occur and work over the life course in the service of personal adaptations (Caprara & Cervone, 2000). These personal adaptations guide affective, cognitive, and motivational processes, leading individuals to achieve their individual and collective goals. They also provide coherence and continuity in behavioural patterns across different settings, and they generate, foster, and preserve a sense of personal identity (Caprara & Cervone, 2000; Caprara, Schwartz, Capanna, Vecchione, & Barbaranelli, 2006).

### *Impulsivity*

Numerous studies have identified core personality traits or dispositional attributes associated with problem gambling. For instance, impulsivity is strongly associated with youth problem gambling. Impulsivity can be defined as a swift action without forethought or conscious judgment, involving carrying out a behaviour in a spontaneous manner characterized by a lack of self-control (Moeller, Barratt, Dougherty, Schmitz & Swann, 2001). This definition describes many of the features of problem gambling, which suggests the study of this personality trait with relation to problem gambling. In a study with 874 high-school students, Secades-Villa, Martinez-Loredo, Grande-Gosende and Fernandez-Hermida (2016) found that all the impulsivity measures were higher in at-risk/problem gamblers than in non-problem gamblers.

Similarly, Benson, Norman and Griffiths (2012) using an opportunity sample of 109 university students verified that impulsivity was a significant predictor of gambling frequency.

In addition, recent studies suggest that impulsivity is not only a simple correlate of gambling-related problems but also plays a causal role in the developmental trajectory. For example, Liu and colleagues (2013) found among urban male youth that being member of the high impulsivity class almost tripled the odds of meeting criteria for problem gambling by the age of 19 years. Moreover, Shenassa, Paradis, Dolan, Wilhelm, and Buka (2012) found that children who exhibited impulsive behaviours at age 7 years were more likely to report gambling problems later in life, in comparison with their non-impulsive counterparts. Furthermore, Slutske, Moffitt, Poulton and Caspi (2012) found that children who showed under-controlled temperament at age 3 years, categorized by a 90-minute observational assessment, were more likely to experience disordered gambling at ages 21 and 32 years,

than children who exhibited a well-adjusted temperament (even after controlling for childhood intellectual ability and family socio-economic status). Therefore, these findings suggest that impulsivity is a specific risk factor for later problem gambling. Several factors may contribute for this evidence. It might be possible that highly stimulating activities, such as gambling, are often pursued as a means to relieve stress among individuals with high impulsivity, and that impulsive youths may be at-risk for developing gambling problems due to the fact that gambling often involves a high degree of sensory and mental stimulation (Nower, Derevensky & Gupta, 2004).

### *Sensation seeking*

Sensation seeking is another personality trait, and it is defined as the pursuit of “varied, novel, complex, and *intense* sensations and experiences, and the willingness to take physical, social, *legal*, and *financial* risks for the sake of such experiences” (Zuckerman, 1994; p.27). Although sensation seeking and impulsivity are interrelated, they are two distinct constructs (Ersche, Turton, Pradhan, Bullmore & Robbins, 2010), and have different neurodevelopmental features (Steinberg et al., 2008). The empirical literature has suggested that sensation seeking is associated with gambling problems. For instance, Gupta, Derevensky and Ellenbogen (2006) found that high levels of disinhibition, boredom susceptibility, cheerfulness, and excitability, alongside low levels of conformity and self-discipline, predicted problem-gambling severity level in high school students. In addition, a study conducted by Harris, Newby and Klein (2015) with a sample of college students showed that the total score on sensation seeking was significantly correlated with problem gambling severity. More recently, a study carried out by Kam et al. (2017) with Macao university students found that problem gamblers scored higher on sensation seeking compared to non-problem gamblers. Therefore, it seems that youth problem gamblers are more inclined to be socially disinhibited and easily bored with routine, and some activities like gambling may provide a lot of stimulation and excitement.

### *Coping*

Coping can be conceptualized as the way in which individuals deal with life circumstances, and regarded as a function of personality and experience (Sheard et al., 2010). Coping has been categorized into two styles, those intended to act directly on the stressor (i.e., task-oriented or problem-focused coping) and those intended to regulate emotional states associated with or resulting from stressful life events (i.e., emotion-oriented coping) (Endler

& Parker, 1990; Folkman & Lazarus, 1985). A consistent body of research has shown that youth problem gamblers use less task focused-coping styles and more emotion-based coping styles (Gupta, Derevensky & Marget, 2004; Bergevin, Gupta, Derevensky & Kaufman, 2006). In fact, young problem gamblers typically experience high levels of childhood maltreatment including emotional, physical, and sexual abuse as well as emotional and physical neglect (Felsher, Derevensky & Gupta, 2010; Jaisoorya et al., 2017), which in turn may lead adolescents to learn deficient coping styles, such as using gambling in order to deal with psychological difficulties and stressful life events (Hayer & Griffiths, 2015).

### **Cognitive factors**

Many studies have shown that cognitive distortions play an important role in the emergence and maintenance of problem gambling among adolescents and emerging adults (Cosenza & Nigro 2015; MacKay & Hodgins, 2012). More specifically, research has shown that adolescents 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). Youth problem gamblers tend to be more susceptible to erroneous beliefs about the independence of the events and are more prone to overestimate their chances of winning (Delfabbro, Lahn & Grabosky, 2006a; Turner, Macdonald, Bartoshuk & Zangeneh, 2008). More recently, Taylor, Parker, Keefer, Kloosterman and Summerfeldt (2015) in a study with a large sample of adolescents with and without special education needs found that cognitive distortions were the strongest predictors of problem gambling among students with and without SEN, when controlling for the effects of other variables. Therefore, these findings suggest that addressing cognitive distortions may be an important component when designing interventions for adolescent gambling, and that cognitive behavioural therapy (CBT) might be used as an effective method for reducing problem gambling behaviour, as it was pointed out in Chapter 1.

### **Family factors**

In addition to individual factors, youth gambling behaviours are also associated with numerous family characteristics (Hayer & Griffiths, 2015). According to McComb and Sabiston (2010), the family influences on adolescent gambling behaviour can be conceptualized in different domains, such as family sociodemographic factors, family members' attitudes, parenting practices, general family climate, and family relationship

characteristics. For the purpose of the present thesis, only the domains of family sociodemographic factors and general family relationship factors will be considered.

#### *Family sociodemographic factors*

Family sociodemographic factors includes parental divorce/separation and family structure (McComb & Sabiston, 2010). However, with regard to this domain, research findings are not consistent. For instance, Langhinrichsen-Rohling, Rohde, Seeley and Rohling (2004) found that family composition (i.e., if the adolescent lived with both parents or not) was not related to gambling group classification. On the other hand, recent studies had shown that family structure appears to increase the risk of problem gambling among youth, namely living without parents (Anagnostopoulos et al., 2017) or living without both parents (Canale et al., 2017). Therefore, there is a need for further research in order to clarify the relationship between family structure and youth problem gambling, and to overcome the lack of empirical attention that been given to this variable in the context of adolescent gambling research.

#### *Parent-child relationships*

Despite the lack of studies examining the effect of parent-child relationships on youth gambling behaviour, previous research has found that the quality of parent-adolescent relationships has an influence in the initiation of other adolescent risky behaviours, such as drug use and delinquent behaviours (e.g., Kuntsche & Kueding, 2006; Miller, Jennings, Alvarez-Rivera & Lanza-Kaduce, 2009; Sousa et al., 2011). However, parent-child relationships are beginning to emerge as potential factors linked to the development of adolescent gambling (McComb & Sabiston, 2010). Some authors have explored the association between parental attachment and youth problem gambling. Attachment may be described as an enduring affectional bond of substantial intensity with special and proximate caring figures in their environment (Bowlby, 1982). According to attachment theorists, individuals form attachment relationships in their infancy, but as children progress into adolescence, the experiences of care and support provided by the caregivers (typically the parents) will help them to develop a sense of security that protect them from situations of stress (Duchesne & Larose, 2007).

This sense of security is inextricably linked to internal working models that children and adolescents build based upon the attachment experiences that they encounter (Duchesne &

Larose, 2007). When children and adolescents develop a secure working model, this will be critical for forming new supportive relationships. In fact, there is an abundant body of evidence that supports the association between internal working models of attachment and the quality of interpersonal relationships (Florian, Mikulincer & Bucholtz, 1995), self-esteem and perceptions of competence (Laible, Carlo & Roesch, 2004), and adolescent adjustment (Brumariu & Kerns, 2010; Scott, Briskman, Woolgar, Humayun, O'Connor, 2011).

For instance, Magoon and Ingersoll (2006) explored the relationship between parental attachment and adolescent gambling in a sample of 116 adolescents. Parental attachment encompasses the perception of emotional support in the forms of involvement, trust, warmth, and nurturance. According to Magoon and Ingersoll (2006), an increased parental attachment was associated with lowers levels of adolescent gambling, whereas a decreased level of parental trust and communication was linked to an increase in gambling behaviour. Furthermore, a study conducted by Pace, Schimmenti, Zappulla and Di Maggio (2013) with a sample of 268 male adolescents aged 15 to 17 years explored the differences between non-gamblers, at-risk-gamblers and problem gamblers. The findings of this study revealed that in comparison with the no gambling group, the at-risk gamblers and the problem gamblers had higher levels of fearful attachment and lower levels of perceived social support. Therefore, these studies suggest that, although not widely explored by gambling researchers, parental attachment seems to play an important role in adolescent gambling behaviours, which suggests the need for further research on this variable, and also on the mechanisms by which this variable exerts its influence.

### ***Macro-level factors***

Beyond individual and family variables, there are some macro-level factors that can have an impact on youth gambling behaviour (Shaed, Derevenky & Gupta, 2010). In fact, some cultural norms can play an influence on the legality and availability of gambling opportunities. In some places in the world, there is the view that gambling is sinful, which has led to its prohibition. For instance, in most Muslim countries gambling is not permitted, which has led to the removal of gambling machines in those countries.

Moreover, as it was noted in Chapter 2, there are differences in gambling jurisdictions between countries. These differences in jurisdictions can also explain the variations in the

development and maintenance of youth gambling and problem gambling between countries (Calado, Alexandre & Griffiths, 2017a).

As the previous section has elucidated, youth from certain ethnic and racial groups are more at risk for developing gambling related problems. Although this can be caused by a low socio-economic status and by an overall stress associated with the adaptation to a new culture, cultural factors may also play an influence here. In fact, cultural differences can also delineate discrepancies in gambling attitudes and behaviours. Individuals who identify themselves with an ideological, social, economic and political values of a gambling-permissive society will be more likely to perceive gambling as a more normative and less risky behaviour, and consequently as an activity that they may choose to pursue (Kun et al., 2012). In addition, existing research suggests that gambling behaviour can serve distinct functions for different cultural groups. For instance, a study conducted by Kim, Ahlgren, Byun and Malek (2016) with 323 casino customers from four ethnic groups (American, Japanese, Korean and Chinese) suggested that motivations to gamble also varied with respect to nationality. This study found that Japanese were more likely to gamble in order to escape from their routine life than the other three groups, whereas socialization was not a major motivating factor for Korean gamblers in comparison with the other nationalities. Additionally, Chinese gamblers were strongly motivated by a chance of hitting a jackpot, followed by the Americans and Japanese (who obtained the same mean score on this dimension) and then the Koreans. Therefore, this research highlights the role of cultural variables in understanding gambling motivations, which in turn will have an influence in the progression from social and regular gambling to problematic gambling (Griffiths & Delfabbro, 2001).

With regard to gambling behaviour, some studies had found higher rates of gambling and problem gambling among specific ethnic groups, such as the Chinese (Blaszczynski, Huynh, Dumlao & Farrell, 1998; Yeh, Hwu & Lin, 1995). Moreover, Chinese were more likely to report chasing behaviour than Caucasians, as well as claiming to be winning when they were not (Oei & Raylu, 2010). Furthermore, a study conducted with women from Brazil and United States (Medeiros et al., 2016) found that the Brazilian sample began gambling at an earlier age and reported an earlier age at onset of gambling disorder. Moreover, Brazilian gamblers reported lower urge scores and higher chasing rates than U.S. gamblers.

Therefore, on a macro level, these studies confirm the importance of recognizing the role of cultural variables in the emergence and maintenance of gambling and problem gambling behaviours. However, in the empirical gambling literature, there is a lack of cross-cultural studies with adolescents and young adults, which contribute to a gap in the knowledge of how cultural factors influence the development of gambling behaviours among this age group. Thus, further research with youth from different cultures would be of both practical and theoretical value.

## **Conclusion**

This brief chapter has demonstrated that a set of individual, family, and macro-level factors are implicated in the development and maintenance of youth problem gambling behaviour. The chapter also showed that problem gambling is a multifaceted rather than an unitary phenomenon, and therefore many factors may come into play in various ways and at different levels to contribute to the emergence and maintenance of problem gambling behaviour. The chapter attempted to review the most relevant individual, family, and macro-level factors. It demonstrated that there is a lack of research on the effect of some variables on youth problem gambling, such as parental attachment, which has been found to have an influence on other youth risky behaviours. In addition, on a macro-level, research mainly conducted with adult populations, found that cultural differences can help to explain differences in gambling motivations and gambling behaviours. However, very few cross-cultural studies have been conducted with young individuals, which could provide further insights about the role of cultural factors among this age group.

Therefore, this thesis addresses the main gaps in the empirical literature on youth gambling, which were outlined above. Moreover, in addition to these gaps, there are some other limitations in the literature: (i) there is little research that examined how some factors might interact with others in the prediction of problem gambling behaviour, more specifically that investigated the mediation effect of individual variables in the relationship between youth problem gambling and family variables; (ii) there is almost a complete lack of gambling research on Portuguese youth, although some early evidence suggest that youth gambling is growing in the country (Lopes, 2009), and very recently online gambling was legalized through the Act of the Parliament 64/2015 ([DL 64/2015], which will increase youth's exposure to gambling; iii) there are no instruments that assessed youth problem gambling behaviour validated to the Portuguese language; and (iv) although there is some research on



risk and protective factors, an evaluation of preventive initiatives aimed at promoting responsible gambling and to having an impact on gambling correlates is still the exception in the empirical literature. Thus, this thesis aims to fill the aforementioned research gaps via the following specific aims:

Aim 1: To examine gambling perceptions, motivations to gamble among a sample of Portuguese adolescents and young adults, and to provide a preliminary understanding of the gambling phenomenon in the Portuguese context.

Aim 2: To validate and study the psychometric properties of a widely used gambling instrument, the DSM-IV-MR-J, into the Portuguese language, and thus, in order to respond to the needs of the Portuguese General Directorate for Intervention on Addictive Behaviours and Dependencies, which recognized gambling as an emergent phenomenon and set in its goals the development of a national strategy for these new addiction (SICAD, 2013), provide to the Portuguese psychological community a new tool to measure problem gambling among youth.

Aim 3: To test an integrative model in which coping strategies mediate the relationship between youth problem gambling and attachment to parents or other figures in a sample of English adolescents and young adults, and thus to overcome the lack of research in the gambling literature that examines the mediation effect of individual variables in the relationship between family variables and problem gambling;

Aim 4: To test an integrative model in which sensation seeking mediates the relationship between youth problem gambling and attachment to parents or other figures in two samples from two different countries (Portugal and England), and thus to verify if this model will be different in these two cultural contexts;

Aim 5: To test the effect of an intervention that was designed based on the aforementioned studies, to prevent problem gambling, and to have an impact on some gambling correlates in a sample of Portuguese high-school students.

The following chapters of the present thesis will attempt to respond to the aforementioned aims:

- Chapter 4 provides an overview of research methodologies, and explains the importance of using a mixed-methods approach.
- Chapter 5 introduces the first empirical study, which comprises a qualitative study examining gambling perceptions, attitudes, motivations, the role of gambling in youth's lives, and the most played gambling activities. Data were collected from

high-school and college students, located in Lisbon, Portugal. This study addresses Aim 1.

- Chapter 6 comprises the second empirical study and was designed to validate and assess the psychometric properties of the DSM-IV-J-MR in the Portuguese language. Data were collected from adolescents (i) with and without gambling experience attending regular high schools, (ii) attending vocational schools where gambling was thought to be more likely, and (iii) in one youth detention center where gambling was thought to be highly likely. This oversampling procedure has already been used in validations of other gambling instruments (e.g., Hayer, 2014) and had the main aim of creating a higher variance of gambling in the sample in order to better analyze the psychometric properties of the scale. This study addresses Aim 2.
- Chapter 7 comprises the third empirical study, and examines how attachment exerts an influence on problem gambling via coping strategies in a sample of adolescents and young adults. This model was tested through structural equation modeling in Mplus, and data were collected in high-schools and in one university located in Nottingham (England). This study addressed Aim 3.
- Chapter 8 comprises the fourth empirical study, and examines how attachment influences problem gambling via sensation seeking in two different cultural contexts (i.e., Portugal and England). The model was tested using structural equation modeling in Mplus, and data were collected in high-schools and colleges located in Lisbon (Portugal) and in Nottingham (England). This study addressed Aim 4.
- Chapter 9 comprises the fifth and final empirical study, and evaluates a gambling prevention program that was designed based on the findings of the previous studies. This intervention comprised five sessions aimed at preventing youth problem gambling, but also some other gambling correlates, such as cognitive distortions, and positive attitudes towards gambling. This preventive initiative was conducted in a high-school in Lisbon (Portugal) and addressed Aim 5.
- Chapter 10 summarizes the main findings, discusses the implications of these studies, presents an overall conclusion and final remarks.

## **Chapter 4 – Methodology**

### **Introduction**

This chapter concerns the research methodology that was used throughout the thesis. To respond to the aims noted in the previous chapter, this thesis begins with a qualitative study, followed by three quantitative studies, and ends with a randomized controlled trial. Therefore, the thesis employs a mixed method approach. Mixed methods research is the use of quantitative and qualitative methods in a single study or series of studies (Tariq & Woodman, 2010). The mixed-methods approach is an emergent methodology, which is becoming to be increasingly used by researchers who want an integration of different types of data that can generate powerful insights into a research question, resulting in a more deepened understanding of complex phenomena. Questions that profit most from a mixed methods design tend to be broad and complex, with multiple facets that may each be best explored by quantitative or qualitative methods (see Box 1 below).

### Box 1 – Broad research question of this thesis and main sub-questions

Broad question: How can we characterize youth gambling behavior in two different cultural contexts, (Portugal and England), particularly in the Portuguese context?

This broad research question prompted several sub-questions; each answered by either a quantitative or qualitative methodology. These sub-questions included:

- What are the experiences and perceptions of gambling behavior among Portuguese youth? (Qualitative)
- What are the psychometric properties of the DSM-IV-MR-J (a widely used instrument to assess youth problem gambling) in a Portuguese sample, and what is the prevalence of problematic gambling in this group? (Quantitative)
- How does youth problem gambling correlate with individual and family variables that received less attention in the gambling literature in a sample of English adolescents and young adults? (Quantitative)
- What are the variables more associated with youth problem gambling and is this association different in two distinct cultural contexts, more specifically in a Portuguese and English sample? (Quantitative)
- What is the effect of an intervention in reducing problem gambling and its associated risk factors in a sample of Portuguese high-school students? (Quantitative)

For answering these different research questions, different types of methodology were employed. Firstly, focus groups with Portuguese adolescents and young adults were conducted. Following this, a study to test the psychometric properties of an instrument and to validate a measure assessing youth problem gambling was conducted, in order to provide a new psychometric tool for use among the Portuguese research community. Thirdly, a study, which examined the relationship between problem gambling and some individual and family variables was carried out. Then, a cross-cultural study to examine the risk factors most associated with problematic gambling in a sample of Portuguese and English youth was then conducted. The findings of these data were subsequently integrated in order to provide a multi-faceted insight into the phenomenon of youth problem gambling, and to inform the design of the gambling prevention program conducted to answer the final sub-research question. A mixed methods design was chosen to facilitate increased breadth and range in

answering the questions proposed. Use of a mixed methods approach illuminated different aspects of the thesis into the broader research question. In this case, mixed methods allowed access to data and insights that each method alone could not provide. Therefore, as different methodologies were used in the present thesis, an overview of the different methodologies will be provided in this chapter.

### **Methodologies**

Research methodology refers to the way of how research is done scientifically (Kothari, 2004). It concerns a perspective or theoretically informed approach to research, which stems from the underpinning epistemological stance (Ryan, 2006). Epistemology can be defined as “the study of the nature of knowledge and the methods of obtaining it” (Burr, 2003, p.202). In other words, it is an examination of how we can make knowledge. Different epistemological positions have answered questions of how knowledge can be achieved in different ways, and once researchers adopt a particular epistemological stance, they usually adopt methods that are consistent with this position (Harper, 2011). Quantitative and qualitative research have different epistemological positions associated. A brief overview of quantitative and qualitative research is provided in the next section.

### **Quantitative research**

‘Quantitative research’ is a term used to define research that works with numerical data that is used to formulate facts and uncover patterns in research (Morgan, 2013). Quantitative research is often underpinned by a more positivist epistemology, where reality is seen as static, and independent from the observer. Therefore, from this approach, reality should be measured objectively, and generalizations should occur free from time and context (Bryman, 2006). Positivist approaches emphasise that researchers should eliminate their biases during the processes of data collection and analysis, remain emotionally disconnected with the objects of the study, test or empirically justify their hypotheses, and ultimately should uncover general laws, that can help to explain the description of reality (Harper, 2011). Thus, quantitative research is typically deductive, objective, and general. It aims to test and validate theory and hypothesis via observations, and is more associated with linking causes to effects. As it concerns theory and models testing, quantitative research relies on pre-determined research designs that first collect and then analyse the data (Johnson & Onwuegbuzie, 2004). Due to its emphasis on objectivity, standardized measurement

protocols that can be reproduced by other researchers are used. As the goal of quantitative research is to determine real causes of scientific events, quantitative research intends to generalize research findings (Howitt & Crammer, 2016). Quantitative researchers aim to establish, confirm, or validate relationships and to develop generalizations that contribute to theory. This emphasis on generality leads to efforts to eliminate the confounding variables, so that the research findings can be applied to a wide range of individuals or settings (Morgan, 2013). Therefore, the findings from quantitative research can be predictive, explanatory, and confirming.

Quantitative research is used when the researcher intends to identify a causal-effect relationship between variables in order to predict and control a given phenomenon, to generalize a phenomenon to a wider population, and to examine the relationship between measurable variables (Howitt & Crammer, 2016).

### **Qualitative research**

'Qualitative research' is a term used to define research that works with non-numerical data, and focuses on describing and categorising the qualities of the data (Howitt & Crammer, 2016). Qualitative research is typically inductive, subjective, and contextual. Qualitative research is exploratory and often starts with observations that are used to create theory or generate hypothesis. In addition, qualitative research intends to capture meanings and to understand the perspectives of the individuals that are being studied (Flick, 2014). In qualitative research, the subjective purposes aimed at meaning and interpretation also involve close, personal contacts that use the researchers as an instrument to analyse the data (Bannister, Burman, Parker, Taylor & Tindall, 1994). Therefore, qualitative methods relies on the skills and abilities of the researcher in a way that is not normally expected in quantitative research (McQueen & Knussen, 2006).

Qualitative research typically examines specific situations or sets of individuals in depth and detail. Procedurally, the attention that this type of research gives to the holist understanding of specific contexts is paired with studying behaviour as it occurs naturally (Morgan, 2013). This emphasis on depth and detail, will necessarily lead to study relatively few and carefully chosen cases. In contrast with quantitative research, which attempts to achieve generalization and replication, this approach wishes to understand the complexity of a phenomenon in its natural setting (Bryman, 2006). Therefore, by contrast to a positivist epistemological

approach, qualitative research is commonly associated with the interpretivism epistemological approach, which postulates that reality constitutes a social constructed phenomenon, that involves multiple perspectives (Yilmaz, 2013). According to the interpretivism approach, that facts are based on perception rather than objective truth, and there are no universal laws as the world is always being developed and re-developed by reflection. In addition, it is not possible neither desirable to achieve context-free generalizations, and the researcher is part of the phenomenon that is being observed. Knowledge is considered subjective, rather than discovered independently from researchers in an objective way (Howitt & Crammer, 2016).

Although there are major differences in epistemological approaches between quantitative and qualitative research, qualitative research is complex, and therefore there are also differences among different qualitative methods (Madill, Jordan & Shirley, 2000). In fact, different qualitative methods are supported by different epistemological approaches, and there are some methods that might assume that there is straightforward relationship between what participant say, and their thoughts, feelings, and other methods might assume that what individuals say is much more influenced by the context of the interaction (Harper, 2011). The qualitative study presented in this thesis is supported by a critical realist epistemological approach, which will be further explained in the next sections.

Qualitative research is used when the researcher wishes to understand the complexity of a phenomenon in its natural setting, when there is a lack of clarity about research questions (Patton, 2002), and when there is generally little or no research into this topic (Howitt & Crammer, 2016).

### **Why combine quantitative with qualitative methods?**

As explained in previous sections, quantitative and qualitative methods are associated with different epistemological approaches, which represent different worldviews about what is legitimate knowledge. Many authors argue that this does not mean that these methods could not be integrated (e.g., Slevitch, 2011). In fact, when both quantitative and qualitative data are included in a research project, researchers may enhance their results in ways that only one form of data would not allow (Hanson, Creswell, Clark, Petska & Creswell, 2005). The use of mixed methods is justified when only one approach alone is inadequate to address the

research question, and when the researcher desires to take advantage of a more in-depth exploration obtained through qualitative findings, and also to examine the relationship among measurable variables achieved by quantitative research (Greene & Caracelli, 2003). Therefore, many authors have argued that the best philosophical paradigm that provides the best foundation for mixed-methods research is pragmatism (Tashakkori & Teddlie, 2003). Pragmatism postulates that among other things (methods or theoretical lens) the research question should be of primary importance (Tashakkori & Teddlie, 2003). According to pragmatism, researchers do not see the world as an absolute unity, and should choose the methods that works best for answering their research question (Johnson & Onwuegbuzie, 2004). Therefore, pragmatism can represent a way to improve communication among researchers from different approaches in an attempt to advance knowledge.

Over the years, several methodologists have discussed the motivations to combine quantitative with qualitative methods, and several rationales for conducting mixed method research exist in the literature. Greene, Caracelli and Graham (1989) identified a number of reasons for combining different data collection methods including: (i) triangulation (when the researcher aims to seek convergence and corroboration of results from different methods and designs studying the same phenomenon); (ii) complementarity (i.e., seeking elaboration, enhancement, illustration, and clarification of the results from one method with results from the other method); (iii) initiation (i.e., discovering paradoxes and contradictions that lead to a re-framing of the research question); (iv) development (i.e., using the findings from one method to help inform the other method); and (v) expansion (i.e., seeking to expand the breadth and range of research by using different methods for different inquiry component). More recently, methodologists have expanded the reasons of conducting mixed methods research: for instance, Punch (1998) suggested that mixed methods investigations may be used to (i) further understand a research problem by converging numeric trends from quantitative data and specific details from qualitative data; (ii) identify variables that may be measured subsequently through the use of existing instruments or the development of new ones; (iii) obtain statistical and quantitative data from a sample of a population and use them to identify individuals who may expand on the results through qualitative data; and (iv) convey the needs of individuals or groups of individuals who are marginalized or underrepresented.



Furthermore, besides the reasons and rationales behind mixed methods research, several authors have conceptualized different typologies of mixed methods research designs. To develop a mixed method design, the researcher needs to take two basic decisions: (i) decide whether s/he wants to conduct the qualitative and quantitative data collection concurrently or sequentially, and (ii) whether s/he wants to give the quantitative and qualitative components of a mixed study equal status or to give one paradigm the dominant status (Johnson & Onwuegbuzie, 2004). The mixed method research design chosen for the present thesis is based on having an emphasis in one component and on a sequential approach (i.e., the quantitative and qualitative data collection will be carried out sequentially).

Therefore, as the present thesis adopted the aforementioned characteristics, it was decided to adopt the mixed methods research design proposed by Morgan (1998). According to Morgan (1998), there are four possible mixed-methods research designs based on the sequencing (order in which the quantitative and qualitative data are used), as well as relative importance (which method, qualitative or quantitative will be the principal tool for collecting data) of each method.

Table 1: Possible combinations of mixed methods research designs according to Morgan (1998)

Design 1	qual followed by QUANT
Design 2	quant followed by QUAL
Design 3	QUANT followed by qual
Design 4	QUAL followed by quant
NOTE: All lower case means secondary method and all upper case denotes primary method	

The research design selected for the present thesis corresponds to the Design 1. In fact, this thesis started with a smaller qualitative exploratory study, carried out to understand gambling perceptions among Portuguese youth, generate further hypotheses, and identify relevant variables that could be assessed in the subsequent quantitative studies, which were considered the central studies of this thesis.

In the following sections, an outline of the qualitative and quantitative methods that were utilised in this thesis are provided. As this thesis started with a qualitative study, the next section begins with a description of qualitative methods followed by a description of quantitative methods.

## **Methods of qualitative research**

### ***Methods of data collection***

As qualitative research emphasises the inductive, contextual, and subjective purposes, the qualitative methods of data collection need to be well suited with these purposes (Morgan, 2013). The methods that are likely to allow the researcher to achieve these purposes, and to have the strengths of qualitative research, such as an understanding of the perspectives of research participants, are in-depth interviews, participant observation, and/or focus groups (Howitt & Crammer, 2016). For the purposes of the present thesis, which chose to use focus groups as the method of data collection in the qualitative study, a more detailed explanation of this method is provided below.

### ***Focus groups***

Focus groups are group discussions organised to explore individuals' views and experiences about a set of issues (Kitzinger, 1995). In fact, it is the group interaction of the focus group that differentiates it from a traditional interview and constitutes the main advantage of this method (Stewart & Shamdasani, 2015). Focus groups generate data derived from the group discussion and allows researchers to gain an understanding of a topic from the perspectives of participants, which a traditional interview fails to do. In effect, the exploration of views, beliefs, and opinions of the group's participants is achieved through group dynamics, that is, through normal processes of discussion and debate among ordinary individuals (Howitt & Crammer, 2016).

In order to organise and run focus group research effectively, some suggestions have been found in the literature (e.g., Winke, 2017; Krueger & Casey, 2015). Firstly, focus group should be comprised of individuals (plural) who will give to the researcher the type of information needed. Secondly, more than one focus group needs to be conducted. In fact, a single focus group is rarely sufficient even if the group appears to be very prolific in terms of generating ideas and discussion. The researcher will need to conduct more than one focus

group to ensure that a good range of viewpoints will be covered. However, it is difficult to say how many groups are needed, as this can vary according to the purposes of the research. Indeed, the researcher may consider running groups until it appears that nothing new is emerging, that is, until the research team noted significant repetition in ideas and concepts, and determined that concept saturation had been met (Guest, Bunce, & Johnson, 2006). Thirdly, focus groups should be used for robust data collection, and therefore should have a narrow purpose and focus on participants' attitudes and perceptions. Fourthly, focus group should be a planned and focused group discussion of the topic at hand by having an interview guide comprised by a series of open-ended questions that sets the agenda for the group discussion. Although these are recommended suggestions in the literature, some researchers emphasise that not all of them will always apply to all focus group research (Morgan & Kreuger, 1993), and therefore they should be seen as general recommendations or a guide that can help researchers in their practice.

For running the group discussions, the researcher should prepare a guide. According to Ho (2012), more general and unstructured questions should come first, and more specific questions should come later once the group discussion has had time to develop. In addition, the group moderator plays a key role in the success of the focus group (Hydén & Bulow, 2003). For Gibbs (1997), the focus group moderator should explain the purpose of the focus group session, create a positive experience for the group members and make them feel comfortable, enable participation by all members of the group and allow the discussion to flow. Moreover, the focus group moderator should not be judgmental and do not show their opinions.

According to qualitative researchers, focus groups may be used in different ways. These can include an early stage of research in order to explore and identify what are the significant issues and/or or to understand the findings of a research in the eyes of the individuals that the research is about (for instance, the qualitative analysis can be used to supplement the quantitative findings) (Howitt & Crammer, 2016). In the present thesis, as there was a great gap in the knowledge on the field of youth gambling in the Portuguese context, and a lack of clarity in the research questions in this particular context, the reason for conducting focus group was used to provide insights most for this emergent phenomenon in Portugal, and as a preliminary step to generate ideas and hypotheses for further research.

### *Methods of data analysis*

Qualitative data analysis is large and complex. Qualitative data analysis consists in a range of processes designed to transform the raw data into a new and coherent description of the phenomenon being studied (Thorne, 2000).

The most common types of qualitative data analysis found in the literature are thematic analysis, content analysis, discourse analysis, grounded theory, and phenomenology (Interpretative Phenomenological Analysis or Existentialist-informed Phenomenology) (Harper, 2011). As the qualitative study presented in this thesis used thematic analysis, the following section will provide a description of this method of data analysis.

### *Thematic analysis*

Thematic analysis is a widely used method within qualitative research, although it has been poorly named, and not considered in the same way as other methods of qualitative analysis, such as grounded theory or phenomenology (Nowell, Norris, White & Moules, 2017; Braun & Clarke, 2006). However, according to Braun and Clarke (2006), thematic analysis constitutes a foundational method that researchers should learn in first place, as it provides the core skills that will be useful for conducting other forms of qualitative analysis. For these authors, thematic analysis should be considered a method in its own right.

Thematic analysis is “method of identifying, analysing, and reporting patterns (themes) within data” (Braun & Clarke, 2006, p.79). Boyatzis (1998) had argued that thematic analysis is a translator for those speaking the languages of qualitative and quantitative analysis, enabling researchers who use different research methods to communicate with each other. Therefore, as the present thesis utilized qualitative and quantitative methods, the use of thematic analysis was considered appropriate.

A rigorous thematic analysis can provide rich, insightful and trustworthy findings (Nowell et al., 2017). One of the main advantages of thematic analysis is that it can provide a detailed, yet complex account of data (King, 2004). Thematic analysis is also a useful method to examine perspectives of different research participants, stressing similarities and differences. Another benefit of this method is its flexibility, as it can be applied *across* a range of epistemological approaches (Braun & Clarke, 2006). In fact, thematic analysis is both compatible with an essentialist/realist approach, which postulates that there is an

unidirectional and straightforward relationship between meaning and experience and language, because language reflects meanings and experiences; and with a constructionist approach, which postulates that meaning and experience are socially produced and reproduced, rather than inhering within individuals (Burr, 1995).

Therefore, thematic analysis conducted under this approach does not focus on individual motivations and experiences, but tries to theorize about the sociocultural contexts that enables individuals to report their experiences. However, thematic analysis can be used with other epistemological approaches located between the two poles of essentialism and constructionism, and characterised by theories such as critical realism. Critical realism was the epistemological approach that supported the thematic analysis conducted in this thesis, and therefore a more detailed description of this approach will be provided in the following section.

### *Critical realism*

Critical realism is an epistemological paradigm, which entails a belief in an independent reality, although it claims that there is no absolute knowledge of that reality (Scott, 2005). In other words, critical realism is critical, because it claims that are objects in the world, including social objects, whether the researcher can know them or not, and that exist independently of our perceptions, theories, and constructions, but at the same time asserts that the knowledge about the world is inevitably grounded in researchers' perceptions and standpoints (Maxwell, 2012). Therefore, for critical realists, an absolute truth is difficult to obtain, because all knowledge is partial, incomplete, and fallible. Critical realism assumes that "the world is the way it is," while acknowledging that there can be "more than one scientifically correct way of understanding reality in terms of conceptual schemes with different objects and categories of objects" (Lakoff 1987; p. 265). As critical realism asserts that entities exist independently of their identification, and that an outer reality exists, and not constructed from discourse, researchers who conduct qualitative research under this epistemological paradigm recognize participants' accounts of their lives and their experiences as real, and intrinsic to them, but also acknowledge that the way these events are experienced, observed and described is affected by social processes, and the context where individuals are placed.

## **Methods of quantitative research**

As quantitative research emphasises the purposes of objectivity and generality, and works with numerical data, the methods of data collection that can provide these type of data are typically surveys and questionnaires (although newer sources of big data generated by online organisations are increasingly being used). In the present thesis, the methods of quantitative data collection that were used were surveys and questionnaires. These methods of data collection are considered to be relatively quick and less time consuming (Johnson & Onwuegbuzie, 2004).

Using these methods of data collection, there are two broad approaches of quantitative research: randomised experiments and cross-sectional or correlational research (Howitt & Crammer, 2016). As the present thesis used these two research designs, a brief overview of each one will be provided.

### *Randomised controlled trial (RCT)*

A randomised controlled trial, often abbreviated as RCT, is type of experiment which is considered the most powerful quantitative research method for determining effectiveness of a treatment (Polit & Beck, 2016). RCTs can also be very useful in assessing the efficacy of psychosocial interventions (Nezu & Nezu, 2008). A major objective of the RCT is to provide reliable evidence that a given intervention had a given effect, or that a causal relationship exists between a given treatment and a given outcome. According to Connelly and Woolston (2016), RCTs must have three different components: controlled manipulation of at least one variable, use of a control or comparison group, and random assignment to the treatment groups.

Controlled manipulation of a variable refers to the fact that, when conducting a RCT, the intervention (independent variable) is isolated, controlled, and manipulated, in order to make a difference in the situation under study (Michie & Abraham, 2004). The use of a control or comparison group is important, as in RCTs, researchers introduce an intervention to the experimental group, and withhold the intervention in the control group, in order to observe the effect of this manipulation (Polit & Beck, 2016). Furthermore, the random assignment to groups involves placing a research participant in a given group (experimental or control group) using a procedure based on chance (Connelly & Woolston, 2016).

When designing RCTs, a researcher always faces some challenges that can compromise this goal, and place a “threat” to the validity on the intervention. Shadish, Cook and Campbell (2002), identified areas in which a threat to validity can emerge, such as temporal precedence, participant selection, and attrition. Temporal precedence refers to the fact that the first condition that needs to be met in order to establish a causal relationship between the treatment and the outcome involves temporal precedence, that is, the cause (intervention or treatment) needs to occur before the outcome behaviour.

In addition, participant selection is related to the fact that a random assignment of participants to the different conditions is always considered an essential ingredient of RCT. In fact, having prior differences between the experimental and control group with regard to several characteristics (such as age, gender, ethnicity, or other sociodemographic characteristic) can prevent the researcher from making valid interpretations of cause-effect relationships concerning the impact of the intervention. However, in most cases, due to reasons of convenience, a researcher chooses to recruit participants the experimental group in place A, and the control group in place B, without randomly allocating them to the experimental or control condition, which can lead to some preexisting differences between the two groups. When this happens, the conclusion that an intervention was effective is compromised.

Furthermore, attrition, another threat to the validity of RCT, and very common when conducting this research design, refers to a significant loss of participants over time (Nezu & Nezu, 2008). According to Kazdin (2003), a large number of individuals tend to drop out at an early stage of the intervention, due to a variety of reasons, such as change of city, death, or boredom. Therefore, before implementing the RCT, wherever possible, the researcher should try to predict the likely impact that interventions, treatments, and control conditions might have on attrition rates, and in case of losing to many participants, the researcher should be cautious when interpreting the effect of the intervention (Nezu & Nezu, 2008).

RCTs can provide the best evidence for psychosocial interventions. However, like other research designs, RCT have also some limitations. The most common limitation is that RCTs are expensive and time consuming, and in most cases require a follow-up (Smith, 2011).

### *Cross-sectional and correlational studies*

Cross-sectional and correlational studies refer to research that, unlike true or randomised experiments, does not involve the deliberate manipulation of variables (Howitt & Crammer, 2016). Cross-sectional studies constitute one of the most common forms of conducting non-experimental research. Cross-sectional studies are used to investigate associations between risk factors and the outcome of interest, or to find the prevalence of this outcome (Kesmodel, 2018). This understanding of the associations between risk factors and the outcome can be very useful for gaining a deeper knowledge of the phenomenon and for generating hypotheses for future research. In a cross-sectional study, data are collected from the population and the research attempts to obtain the maximum number of responses. Therefore, when designing a cross-sectional study, the researcher needs to think carefully what measures are relevant to include, in order to maintain optimal response levels. For instance, a very long survey may bother the participants and might increase the dropouts (Levin, 2006).

One of the main advantages of cross-sectional studies is that they are relatively inexpensive, and take relatively little time to conduct (Kesmodel, 2018). In addition, they can estimate the prevalence of a given outcome in a certain group, and the association between risk/protective factors and the outcome variable. Due to the knowledge in this association, cross-sectional studies can be very useful in generating hypotheses for future research, and for planning interventions. However, one of the main disadvantages of this research design is that it does not allow researchers to make causal inferences (Levin, 2006; Setia, 2016).

### **Conclusion**

Many of the areas explored in psychology are multifaceted. Mixed methods research (combining quantitative and qualitative methods in one study or across studies) is an innovative and increasingly popular way of addressing these complexities. Quantitative and qualitative research methods investigate and explore the different claims to knowledge and both methods are designed to address a specific type of research question. While the quantitative method provides an objective measure of reality, the qualitative method allows the researcher to explore and better understand the complexity of a phenomenon. The mixed-method approach provides the research team with a wider range of tools at their disposal in order to answer a question. However, despite its considerable strengths as an approach, mixed methods research can present challenges and requires that researchers need a solid understanding of multiple methods. Nonetheless, the author of this thesis believes that the



production and integration of different types of data and the combination of skill sets can generate insights into a research question, resulting in enriched understanding.

Today's research world is becoming increasingly inter-disciplinary, complex, and dynamic. Consequently, researchers need to complement one method with another. Furthermore, in this thesis, qualitative methods have been used in an effort to engage with and understand young individuals' experiences and perceptions of gambling, whilst recognising the importance of quantitative research in producing knowledge about factors that are more associated with youth problem gambling. This informed the development of the intervention that was carried out to prevent the initiation and expansion of problem gambling and its risk factors among young individuals. The next chapters will present the empirical studies that were conducted in an attempt to gain a deeper understanding of the phenomenon of youth problem gambling.

## **Chapter 5 – Study 1: Perceived gambling behaviours among adolescents and young adults: An exploratory study**

As it has been elucidated in previous chapters, the Internet can have an important role in the development of gambling practices among young people (Griffiths, 1999). Over the last 15 years, new forms of gambling have appeared including technologically advanced slot machines, video lottery terminals (VLTs), interactive television (i-TV), telephone wagering, mobile phone gambling, and gambling via social networking sites (Griffiths & Parke, 2010; King et al., 2010). These new forms of gambling have radically increased accessibility and availability (Messerlian et al., 2004; Froberg, 2006). Therefore, many children and adolescents are now growing up being exposed to various types of gambling in a completely different way compared to previous generations.

The empirical literature suggests that a large proportion of adolescents are gambling in spite of age prohibitions (e.g., Haroon & Derevensky, 2002; Volberg et al., 2010). For example, two regional studies that were carried out in Australia indicated that gambling is fairly established among Australian adolescents (Moore & Ohtsuka, 2000; Delfabbro, Lahn & Grabosky, 2005). This was also confirmed in a more recent longitudinal study of adolescents in South Australia (Delfabbro, King & Griffiths, 2014). Similarly, in UK, adolescent gambling is widespread particularly on slot machines due to the thousands of amusement arcades and family leisure centres throughout the country where children and adolescents can legally gamble (Griffiths, 2011).

As with video gaming, adolescent gamblers can experience gambling-related problems that often negatively impact their lives (Haroon & Derevensky 2002; Wickwire, Whelan, Meyers & Murray, 2007; Volberg, et al., 2010), including dysfunctional social relationships (Gerdner & Svensson 2003), psychological maladjustment (Delfabbro, Lahn & Grabosky, 2006b), and conduct problems (Barnes, Welte, Hoffman & Dintcheff, 2005), particularly among adolescent boys (Griffiths, 2011; Martins, Storr, Ialongo & Chilcoat, 2008).

In fact, it has been argued that youth are receptive to modern forms of gambling because of the apparent similarity between these games and other technology-based games with which they are familiar with (Delfabbro et al., 2009). Indeed, the MMORPGs use a ‘virtual economy’ where players try to gain as many points as possible (which have been referred as

a 'non-financial form' of gambling [Griffiths, 1991b]). This structural feature of online games has been conceptualized as a rewarding reinforcement mechanism where players attempt to gain points, credits, prizes, and/or money that may lead some adolescents to initiate traditional gambling behaviours (Delfabbro et al., 2009). Furthermore, some research suggests a relationship between gaming and gambling. For instance, an early study carried out by Gupta and Derevensky (1996) with school children revealed that high-frequency video game players reported a significantly higher level of gambling experience as compared to low frequency video game players. Also Wood, Gupta, Derevensky and Griffiths (2004) have found that regular adolescent gamblers were more likely to report videogame playing than less frequent ones. More recently, King, Ejova and Delfabbro (2012) found that videogame playing is a significant predictor of gambling cognitions and superstitious thoughts about gambling.

Due to the growing evidence suggesting that youth are at increasing risk for developing gambling problems (King et al., 2010), and given the widespread availability of legalized gambling venues which make more underage youth to engage in those activities (Messerlian et al., 2005), it has become important to explore young individuals' perceptions, beliefs, and experiences of gambling behaviours. In fact, according to Theory of Reasoned Action (Ajzen & Fishbein, 1980), it is thought that belief (i.e., an individual's subjective knowledge and the perceived costs and benefits of the behaviour) influences attitude (i.e., an individual's positive and negative feelings about a particular behaviour), that in turn shapes behavioural intention.

On the other hand, previous research revealed that young individuals' beliefs are an accurate predictor of their gambling behaviour (Moore & Ohtsuka, 1999). According to some empirical evidence (e.g. Derevensky, Gupta and Winters, 2003; Hume & Mort, 2011), youth define gambling in terms of fun and perceive themselves as invulnerable and do not readily acknowledge the potential adverse consequences of gambling. Previous research has also indicated that adolescents perceive gambling as exciting, daring and potentially addictive, and that it relieves boredom and improves their social networks (Griffiths, 2011; Skinner, Biscope, Murray & Korn, 2004). Beyond these perceptions associated with socialization among their peers, previous studies also suggest that youths' perception of parental involvement with gambling plays an important role in the initiation and maintenance of

gambling participation for youth (e.g. Felsher, Derevensky & Gupta, 2003; Wood & Griffiths, 2004).

In addition to socialization, research suggests that youth view gambling as an activity to win money (Wood & Griffiths, 2004) and have beliefs that it can be a lucrative activity (Delfrabbo, Lahn & Grabosky, 2006a) perhaps indicating that adolescents overestimate their chances of winning (Wood & Griffiths, 2002). In fact, with regard to the skills needed to gamble, adolescents tend to overestimate the importance of skill and they perceive that they can become a good gambler if they practise (Hardoon & Derevensky, 2002; Derevensky, Gupta & Della Cioppa, 1996).

Research has also emphasised that adolescents do not appear to distinguish between the concepts of probability, fate, luck and chance, and that young problem gamblers have more faith in their ability to manipulate chance and 'beat the system' (Froberg, 2006; Griffiths, 2011; Moore & Ohtsuka, 1999). More recently, Primi, Donati, Bellini, Busdraghi and Chiesi (2013) found that adolescent 'at-risk' gamblers and adolescent problem gamblers showed a more optimistic view of gambling's economic advantages compared to adolescent non-problem gamblers. Therefore, the findings of these studies showed that youth are likely to form beliefs about gambling, which are associated with the development of gambling related problems among this age group. Thus, exploring young people's beliefs and perceptions of the gambling activity assumes particular relevance.

In Portugal, little research has been conducted on gambling, and almost nothing published in peer reviewed journals. The few studies that have ever explored gambling behaviours using Portuguese samples suggest that the prevalence of gambling in youth is similar to those in other countries (Lopes, 2009). Considering the lack of empirical studies in the Portuguese context, the main goal of the current research was to explore perceptions about gambling behaviours in adolescents and young adults, in order to obtain a preliminary understanding of this phenomenon in this particular context. Given the exploratory aims of the proposed research, a qualitative methodology was viewed as most appropriate as it helps to draw patterns of meaning in a more detailed way than other self-report measures, such as questionnaires (Hayes, 1997). In addition, as it was already pointed out in Chapter 2, adolescents and young adults are highly vulnerable to gambling. However, there is a paucity of research examining adolescents and young adults with respect to gambling perceptions.

This issue is particularly important as development differences may contribute to differences in perceptions between two age groups. Furthermore, as far as we are aware, there have been no published studies exploring such variables within the Portuguese context.

Therefore, the present study aimed to explore youth perspectives on gambling behaviours in a Portuguese sample of adolescents and young adults. More specifically, the study aimed to explore the (i) role of gambling in adolescents and young adults' lives; (ii) adolescents' and young adults' general perceptions for gambling, (iii) their experiences and their knowledge about gambling and (iv) motivations. Unlike most other previous studies, this research aimed to examine adolescents (for whom underage gambling activities are illegal), and young adults' perceptions of gambling. Because of its exploratory nature, there were no specific hypotheses although it was expected that the findings of the present study would generate hypotheses for future research that would have the potential to facilitate the progress of appropriate public health responses.

## **Method**

### **Participants**

Forty-six participants aged between 13 and 26 years were recruited using convenience sampling. Participants were grouped according to their age. More specifically, participants younger than 18 years that attended high school were considered adolescents. Participants older than 18 years that had finished high school and attended other academic institutions were considered young adults. Eight focus groups were conducted, four with adolescents (N= 26) and the remaining three with young adults (N=20). For the adolescent group, the age ranged from 13 to 17 years old (M=16.07; SD=1.2). For the young adult group, the age ranged from 19 to 26 years old (M=21.07; SD=2.2) Focus groups size ranged from four to ten participants. Seven focus groups comprised mixed gender, and the remaining one was male-only. The majority of participants lived in the Lisbon area and one adolescent focus group lived in Covilhã, in the North of the country. All were in full-time education.

### *Participant recruitment*

The recruitment of the adolescents was facilitated by contact between the first author and two different schools located in Lisbon area. The initial contact comprised an invite for students to participate in focus group discussions about gambling. Following initial contact,

the schools themselves selected participants for the study randomly. One adolescent focus group was obtained via a family contact of the second author who asked if they could locate adolescents to participate in the study. Young adults were students recruited from a public university in Lisbon. For the first focus group, participants were recruited via informal contact between the second author and her students who attended university classes. The remaining students were recruited via snowball sampling using student contacts.

## **Materials and procedure**

### *Theoretical perspective*

Qualitative research is a suitable method for exploring subjective experiences and to elicit an in-depth understanding of participants' perspectives, which were seen as more useful in generating ideas. Our methods were underpinned by a critical realist position (Maxwell, 2012). Therefore, we accepted participants' accounts of their lives and their experiences as real, but also recognize that these accounts were inevitably grounded in participants' beliefs, and influenced by social processes, and context where individuals are placed (Bhaskar, 2002; Lakoff, 1987). An inductive approach was used in order to understand participants' perceptions, and meanings, rather than seeking their views biased by the evidence base or by pre-conceived analytical frames. Therefore, directed by this approach, during focus groups discussions, participants were encouraged to express themselves freely. Thus, the goal of this research was to ensure that the findings were embedded in the data, and not driven by researchers' theoretical interests, although in qualitative research, researchers can never entirely free themselves from their theoretical positions (Braun & Clark, 2006). Therefore, the data analysis should also be considered in light of individual researcher factors.

### *Data collection*

Semi-structured interviews with eight focus groups were conducted (i.e., four with the adolescents and four with young adults). In fact, semi-structured interviews offer structure, whilst also being flexible enough to allow for unanticipated ideas to emerge (Robson, 2002). Therefore, a single focus group discussion guide was developed to ensure that certain areas were covered and used in every focus group in order to facilitate the exploration about gambling, and to compare the responses between adolescents and young adults.

The questions of the interview guide were theoretically-based. Following Krueger and Casey's (2015) procedures, the group discussion guide began with more a general question that aimed to explore the role of gambling in their lives. This was followed by more specific questions concerning the specific goals of the current research (e.g., motivations underlying gambling, general perceptions). Participants were invited to discuss the questions among themselves and were asked to be as honest as possible as there were no right or wrong answers to any of the questions. In addition, care was taken to produce a warm and friendly atmosphere where students could talk honestly about gambling and their experiences. The focus group were conducted by the first and second authors. The focus group facilitators probed for clarification if required and used validation comments (e.g., "Thank you for that comment") throughout the research process. Furthermore, a verbal summary of the discussion was provided at the end of each focus group to ensure that the main points had been understood.

Seven focus group discussions took place in the participants' respective educational establishments after institutional permission of directors or tutors. The remaining focus group was carried out via a family member of the second author and did not require institutional permission. After explaining the goals of the study, teachers of both school students asked for the participants' informed consent along with permission from their parents. For one adolescent focus group, the goals were explained to a family member of the second author who explained it to other participants and asked for parental consent. Only those adolescents that had parentally approved informed consent were eligible to participate in the focus group. In the case of the young adults, informed consent forms were distributed immediately before the beginning of the focus group interview. All ethical procedures in addition to written consent (e.g., freedom to withdraw at any time, de-identification during transcription) were adhered to. The present research was granted permission by the research team's university Ethics Committee.

The length of each focus group was approximately one hour and was audio-recorded. At the end of the discussion, rewards were not offered for participants, but participants were thanked and debriefed. In the establishments where focus groups were conducted, the researcher promised to send a copy of the findings of the study. The audio-taped interviews were then transcribed verbatim.

### *Data analysis*

Interview transcripts were analysed by means of a thematic analysis, which is “method of identifying, analyzing, and reporting patterns (themes) within data” (Braun & Clark, 2006, p.79). Thematic analysis is a flexible method that can be used within different theoretical frameworks (Nowell et al., 2017) and it had been commonly used within a critical realist epistemological position (e.g., Buscemi, Cassidy, Kilbride & Reynolds, 2018; see also Harper, 2011). From a critical realist epistemological position, the analysis aimed to prioritise participants’ perspectives, and experiences. In addition, consistent with a critical realist epistemological position, a semantic analysis was performed, as it focused on the semantic content of the transcripts, as we were not looking for anything beyond that a participant has said. A semantic approach was also chosen as it allows to obtain an overall rich thematic description of the entire data set (where some depth and complexity is necessarily lost), rather than a more detailed description of one particular theme (Braun & Clark, 2006). This is particularly useful when investigating an under-researched area, such as the case of youth gambling in Portugal.

However, although a semantic approach was used, our analytical process involved not only a description, but also an interpretation of the data, in which we attempted to reflect about its meanings and implications (Patton, 2002). The data was analysed following the steps outlined by Braun and Clark (2006): (i) an initial reading of transcriptions to gain familiarity with them. At this stage, no formal coding was carried out, although any relevant material that helped to understand participants’ perceptions and views was highlighted. Following this initial process, these preliminary highlighted comments were sometimes used in order to define descriptive codes that were relatively close to the data; (ii) production of initial codes through a process of organising the entire data set into meaningful clusters and interpreting the meaning of such clusters when necessary; (iii) collating codes into potential themes; (iv) reviewing and refining themes for coherence; (v) create definitions and names for each theme, by determining what aspect of the data each theme captures, and then identify whether a theme contains sub-themes, and (vi) finalizing the report, by choosing relevant extracts that clearly illustrates the essence of the theme. Commonalities and differences amongst participants’ views were also noted.

A set of themes and sub-themes emerged. General themes emerged through the interpretative coding and sub-themes or more specific themes during the descriptive codes.



In order to ensure the quality of this qualitative analysis process, investigator triangulation was taken into account (Denzin, 1978), and within a critical realist epistemological approach, investigator triangulation refers to the participation of more than one researcher in the same study to provide multiple observations and conclusions (Carter et al., 2014; Madill et al., 2000). Furthermore, as critical realist approach considers that there is an independent reality, but the attempts to describe and explain this reality are fallible, and grounded on particular perspective and worldviews (Maxwell, 2012), it was expected that personal and cultural perspectives would inevitably impact the analysis. Thus, a critical reflection was used to understand how researcher factors as well as their cultural and professional assumptions may have influenced the analysis (Shaw, 2010).

### *Critical reflection*

The principal investigator (PI) (FC), female, Portuguese nationality, with a degree in Psychology, and a training in clinical Psychology, had a particular interest in youth gambling behaviour based on her previous clinical experience of working with adolescents. The second author (JA), female, Portuguese nationality, PhD in Psychology, and also with some experience in clinical work with children and adolescents, developed a special interest for the work with youths from minority backgrounds. The previous clinical experience with adolescents of both FC and JA was at times used to facilitate the focus group discussions. However, the PI was keen that her previous experiences and interests would not influence the analysis, although to some extent this is inevitable. Therefore, in order to make the findings data driven and not influenced by research bias, investigator triangulation was taken into account.

### **Results**

Results are described in terms of the major themes and sub-themes that emerged. In the following section, themes and sub-themes are discussed in more depth. The main themes will appear in bold, and the sub-themes will appear underlined. Direct quotes (where relevant) will appear in italic, and will be used to highlight the themes. Following the procedure used in other qualitative studies, preliminary interpretations will be made after the quotations. Furthermore, each quote had been given a coding reference related to (i) which of the two age groups each participant belongs, and (ii) the number that has been attributed

to each participant. For instance, a code of YA1 means that this participant was a young adult, with the attributed number 1.

### *Themes and sub-themes*

#### **Gambling activities**

Both adolescents and young adults stated that gambling was an activity they carried out during their leisure time. During the discussion, study participants reported the gambling activities that they participated in or that they were familiar with. Participants from both age groups reported online poker, and football bets. In addition, participants also emphasised that football bets were a popular activity among young individuals, and that there are guides to football betting on the Internet, to teach individuals how to bet and to make potential players more aware of football betting terms. Moreover, young adults also mentioned other gambling games, such as chess and cards. Furthermore, both adolescents and young adults reported that certain online games, the Massively Multiplayer Online Role-Playing Games (MMORPGs) could be considered as a gambling activity, because it allows players to win money. As two adolescents and one young adult said:

*“There are MMORPGs which in the end of a given number of tournaments, we can win money. So, I think this is a gambling game” (A1)*

*“One of the gambling games that I know is World of Warcraft... I know many people who play World of Warcraft and they receive money for [playing]” (A2)*

*“I know people that sell virtual currency won in the game for real money” (YA1)*

Therefore, all these narratives show some blurring between gaming and gambling and that for young people some online games, especially the MMORPGs can also be regarded as a gambling activity.

#### **Access to gambling by underage youth**

Throughout the focus group discussions, both adolescents and young adults mentioned that age restrictions did not stop underage youth from gambling. As some participants pointed out:

*“People under 18 play games for gamble, there is no control” (A3)*

*“It’s easy for underage youth to gamble online, I don’t know how...maybe faking the ID”*  
(A2)

*“I think that in online gambling and in offline gambling it is easy to overcome the legal barriers, for instance when I was in high school, people used to play online poker with real money”* (YA2)

Therefore, these participants’ accounts suggest that although there is an age limit of 18 years to gamble in Portugal (as in many other European countries), it seems relatively effortless for underage youth to engage in many forms of gambling, both offline and online. For these participants, there is not too much control of people who gamble, and one participant mentioned that one possible strategy for underage individuals overcome the legal barriers of gambling is faking their ID.

### **General perceptions for gambling**

An analysis of participants’ discourses revealed three sub-themes within this theme, more specifically money, gambling as an acceptable and fun activity, and gambling as a risky activity.

Money: Many adolescents associated gambling with money. As some adolescents pointed out:

*“When someone talks about gambling, I immediately think about people winning lots of money”* (A4)

*“I always related gambling with money, and because people now want to win more money, they gamble more”* (A5)

*“I think people now gamble less than other times because there is less money to gamble”*  
(A6)

Therefore, these statements suggest that for adolescents, gambling is an activity highly related with money, although money can be a facilitating factor which can encourage some individuals to gamble, whereas for others money can have a more inhibitory role, and can prevent individuals from engage in gambling.

Acceptable and fun activity: Both adolescents and young adults perceived gambling as an acceptable and fun activity.

*“If people play a game for money and don’t become addicted...it’s not bad” (A1)*

*“If we have luck I think it’s cool to gamble” (A7)*

*“It is fun when we are winning (YA3)*

These statements show that members of both age groups perceive gambling as an admissible and enjoyable activity, especially when they are winning, having luck, and if they do not become addicted.

Risky activity: Besides the perception of gambling as an acceptable and funny activity, for some young adults, gambling was perceived as a risky and hazardous activity.

*“Tempting, but not beneficial” (YA4)*

*“Positive reinforcement is manipulated” (YA5)*

*“People start to gamble, and they can win some money in the beginning, but in the end they have the risk to become addicted” (YA6)*

*“When someone talks about gambling, I think about some people that I know... people that go to the casino, and think they are very lucky when playing those games...they think that they can win money, but in the long term, this will not be possible, because the casino needs to have the profit...people can lose money...gambling is really dangerous (YA7)*

These accounts suggest that young adults seem to have a better understanding of what gambling is about, as they expressed that it is not plausible to win money in the long run, and that gambling has the risk to make individuals addicted.

### **Motivations**

Within this theme, two sub-themes have emerged, financial rewards, and social motivations.

Financial rewards: Both adolescents and young adults highlighted that financial rewards were one of the main motivations that make people want to gamble. As some participants reported:

*“On gambling the motivation is only winning money, that’s it” (A7)*

*“I think that one of the reasons why people gamble is because they want to win money quickly” (YA8)*

*“I think the main reason why people gamble is to win money, but there are some gambling games, in which you can win more money... for instance, I don't think you can win too much money on scratchcards, but sometimes in a casino, you can win 500 euros in one evening” (A8)*

*“In lottery, sometimes you can win lots of money, that's why people play lottery games... I know many people who play the EuroMillions because they are expecting to win the Jackpot...and indeed it's amazing the amount of money you can win for just playing it” (A9)*

Therefore, all these accounts emphasised winning money as the key reason for gambling. In this respect, one participant (YA8) stressed that gambling was a good way for people obtain money quickly. Moreover, a distinction between several gambling activities were made, in which lottery and casino games were seen as providing the best chance to win money, whereas scratchcards was viewed as offering less chances for it. In addition, it is important to note that these statements emphasised lottery as a gambling activity which allows people to win “lots of money”, which suggest that participants were more focused on the amount of money that could be won, and not on the real chances of winning it.

Social motivations: Besides financial motivations, adolescents also identified social motivations behind gambling behaviour. As one adolescent said:

*“When we play and we win, we gain social prestige in our social network” (A10)*

Therefore, this statement shows that for adolescents, gambling can be used as a chance to be more appealing, to be accepted, and to obtain more respect among their peers.

### **Family behaviour**

Within this theme, two sub-themes have emerged, that is, family approach towards gambling and parental gambling.

Family approach towards gambling: Participants' reports for this sub-theme encompassed a number of different elements that included gambling as an activity not supported by their

families, namely due to the lack of knowledge of online activities, and due to bad outcomes that gambling can bring. As two adolescents reported:

*“When we do online gambling, our family don’t like because they don’t understand very much about computers” (A7)*

*“My family don’t like because of the bad outcomes gambling can bring, such as addiction” (A8)*

However, besides these statements, some adolescents also reported that their families supported their gambling behaviour, as it is shown in these adolescents’ accounts:

*“If I play games outside the computer, my family like it even if it is gambling” (A9)*

*“I think my parents don’t mind if I gamble... I don’t think they see this as a problem” (A10)*

Therefore, these statements show that some parents and family members do not view gambling as a problematic activity, and perhaps they can reinforce this behaviour.

Parental gambling: Additionally, for both adolescents and young adults, parental gambling emerged in their accounts:

*“If parents are gamblers, maybe their children will be” (A10)*

*“I know parents that pay for their children gamble” (YA9)*

These accounts show that youth gambling may be facilitated by their parents’ behaviour. The last statement indicates that some family members provide gambling opportunities to the younger ones.

### **Consequences**

Throughout the focus group discussions, both adolescents and young adults mentioned that gambling had negative consequences. Participants’ accounts pointed out several negative consequences, such as brain damage, tiredness, depression, and poor academic performance. Besides these negative consequences, young adults also reported that financial consequences were another negative consequence derived from gambling behaviour. These consequences were clearly shown in the following statements:

*“One of the bad things that gambling can bring is the amount of money that people spend on it... sometimes, people spend so much on gambling, and then they have no money to pay their bills” (YA10)*

*“When I think about what happens in people’s lives after they start gambling... I think that gambling is mainly an illusion, sometimes people assume that gambling can be good for them, but this is not true... gambling cannot bring good outcomes. In the end, you will spend loads of money, and this will bring harmful effects to your life” (YA11)*

These statements highlight an awareness that individuals who engage in gambling can often face negative financial consequences, such as big losses, which will make them unable to meet more basic needs (such as paying their bills). The last statement emphasised that gambling is an illusion and people who start gambling should not expect that this will bring positive consequences for them.

Furthermore, besides these negative consequences of gambling, adolescents also reported that gambling can bring positive consequences as well, such as more entertainment and the possibility to win money.

*“There are people who have more entertainment and therefore are not so bored neither so addicted to TV” (A2)*

*“There are people who have a better life because of the money they win [on gambling]...they have big houses” (A11)*

*“One of the good things that gambling can bring is that people can win money... for instance, in gambling advertisements, it usually says winning is easy, some of them have some welcoming bonus...therefore, I don’t think it is very difficult to get money from gambling” (A12)*

It is important to note that only adolescents (and not young adults) reported positive consequences of gambling. This age group, in comparison with young adults, seems to believe that gambling can be a lucrative activity.

### **Gambling and information technology**

Within this theme, two sub-themes have emerged, which were respectively, videogame and simulated gambling as a gateway for gambling, and comparisons between gambling and gaming.

Videogame and simulated gambling as a gateway for gambling: During the focus group discussions, many participants agreed that videogames were commonly used by youth, and explained that playing videogames, and gambling games with virtual money were considered as a training for real gambling. In fact, three adolescents reported:

*“It depends of gaming...if someone starts to game and starts to win more and more, then he became confident about his skills and start to gamble” (A1)*

*“For instance, in online poker people begin gambling with virtual money and wins and then create the desire to win real money and then bets real money because they know they play well and can win more money”(A12)*

*“I used to play a videogame, Fable 2, which had a casino there, and I was good in playing this videogame. So, I started to play an online casino, similar to the one that was in that videogame, because I knew that I had the skills for playing it” (A13)*

These quotations are illustrative that for adolescents playing videogames and gambling games with virtual money can make them become inaccurately confident about their skills when playing gambling games, learn some principles of gambling, and induce the desire to play with real money.

Comparisons between gambling and gaming: Throughout the focus groups, participants made some comparisons between gambling and gaming. Both adolescents and young adults reported that these two activities shared similar characteristics, such as specific features of the games, namely competition, and that both of them triggered positive feelings, such as excitement and pleasure.

*“Pleasure, everything gives pleasure” (A2)*

*“Both gaming and gambling gives excitement, when I want to become more excited, I gamble for money” (YA12)*

*“When I feel bored, I think is a good idea to gamble or play some online games, because they give good feelings and moods, such as more adrenaline and excitement” (A11)*



These statements show that both gaming and gambling can be stimulating activities that may help individuals to feel less bored and generate positive feelings of excitement and adrenaline. However, the quote from participant YA12 suggest that although both activities can bring excitement, gambling is considered to bring more than gaming, and individuals may choose to gamble when they want to experience a feeling of greater enthusiasm. In addition, for the majority of adolescents, gambling and gaming shared other common elements, namely financial aspects:

*“Money is always present because frequently we have to pay for gaming” (A14)*

*“I think gaming and gambling share many things, and money is one of them... money is a common thing between gambling and gaming because in many online games, we need to pay for some items in the game, and we can also sell these items to our friends...in the end gaming and gambling are not so different” (A15)*

These statements show that adolescents reported that money is also a common element between these two activities, as in many online games, players need to pay for some items, and they can also sell these items to other players, and thus win some money. On the other hand, young adults also reported differences between gambling and gaming, as it can be seen in the following extracts:

*“In gaming, at the end we can learn from our mistakes” (YA11)*

*“Gambling is mainly luck...is different from gaming” (YA13)*

*“When we play poker for money, the only goal is to beat the other players, you don't get any other excitement” (YA14)*

*“[in gambling] we don't grow as a team” (YA15)*

These quotations illuminated the complex relationship between gaming and gambling: although they are two distinct activities, most adolescents reported that they share common elements, such as specific features of games, positive feelings, and financial aspects, as money is present both in gaming and gambling. However, although young adults reported that both activities triggered positive feelings, and mentioned other similar characteristics between these two activities, such as specific features of games, this age group (in contrast with adolescents) also emphasised some differences between gambling and gaming, as they stressed that in gaming there is the possibility of self-improvement, while gambling is more

a lonely activity where individuals only attempt to beat other players, and do not cultivate other skills, such as growing as a team.

## **Discussion**

The present study aimed to explore perceptions of gambling behaviours in Portuguese adolescents and young adults. Such an investigation is particularly relevant as there is a paucity of research within the field of youth gambling in the Portuguese context. Therefore, the results presented here are of substantial interest as the few studies that have begun to explore these phenomena in Portugal, have claimed that young individuals constitute a new focus of concern (Lopes, 2009), possibly due to the wide-scale sanctioned gambling via the Internet. According to Patton (2002), qualitative exploratory studies constitute a starting point for research within a field where very little is known, so a qualitative study was considered to be the best approach for this goal. Therefore, the findings provide an important first look on how gambling is viewed by Portuguese youth in general, and unlike most published studies, this research examines adolescent and young adult gamblers, particularly concerning perceptions and views towards gambling. This was particularly important in generating hypotheses for future research and to understand the differences in perceptions for young adults and adolescents, for who gambling activities are illegal.

The results of the present study indicate that gambling, in spite of being an illegal activity for underage youth, appears to play an important role in adolescents' lives. In fact, besides other gambling games, adolescents also emphasised that MMORPGs can be played as a gambling activity, allowing individuals to win money after playing in a number of tournaments. This finding is particularly worrying, as it suggests that the boundaries between gaming and gambling are becoming more unclear, which can create more difficulties for youth to distinguish between these two activities. In addition, such overlaps can also create problems for regulatory classifications, screening, diagnosis and treatment (King, Gainsbury, Delfabbro, Hing & Abarbanel, 2015).

Participants in this study also emphasized that individuals can gamble despite age prohibitions, suggesting that gambling opportunities for adolescents are growing. In addition, beyond playing MMORPGs (that can be played as a gambling activity), adolescents also talked about playing online poker. This finding is in line with previous studies which show that this age group engage in online poker (e.g. Griffiths & Parke, 2010;

Lambos et al., 2007), although this appears to be more the domain of young adults, given that they are legally allowed to gamble online.

With regard to the general perceptions about gambling, money and other positive aspects (e.g., being a 'cool' activity if they have luck), appear to be widespread among adolescents. However, young adults appeared to emphasize some of the more negative aspects about gambling and talked about potential tempting and manipulating characteristics, which were not mentioned by adolescents. These findings in the present study suggest that adolescents, in comparison with young adults have a more positive perception towards gambling, and associate it more with winning money. These data could perhaps be explained by the fact that adolescents – due to less mature self-insight resulting from their egocentricity and developmental immaturity – are relatively naive about gambling in the sense they believe that winning is easy (Moore & Ohtsuka, 1999) and therefore could win lots of money on these activities (e.g. Wood & Griffiths, 1998; Korn, Hurson & Reynolds, 2005), and are not so aware about the potential hazards and manipulating aspects of gambling (Zangeneh, Mann, McCready & Oseni, 2010).

With regard to motivations, adolescents talked about financial rewards and social prestige. A noteworthy aspect related to financial rewards was that for adolescents, lottery was emphasised as a gambling activity which allows people to win substantial amounts of money. This finding is in line with other research conducted on youths' perceptions about gambling (e.g., Wood & Griffiths, 2002), and suggest that adolescents are not aware about the real chances of winning, and again confirms the erroneous perception that this age group have about gambling as a lucrative activity. Conversely, young adults only reported financial rewards. This finding may be explained by the fact that adolescents view gambling as a socially attractive activity, that is, it enables adolescents to prove themselves in front of their peers, which is consistent with previous research (Skinner et al., 2004; Zangeneh et al., 2010). Furthermore, adolescents are also more susceptible to the influence of their peers in risky situations (Gardner & Steinberg, 2005), which may also elucidate why they use gambling as a mean to obtain more social prestige among their friends. With respect to family behaviour towards gambling, a relevant issue was that in both adolescents and young adults, the inter-generational behaviour was stressed. This finding is not surprising given that several authors have showed that it is usually parents who introduce gambling to their children (e.g., Griffiths & Wood, 2000; Fisher, 1999).

In relation to gambling consequences, adolescents talked about entertainment enhancement and a better life due to money being won, whereas young adults reported more about negative consequences, and emphasised that gambling is an illusion. This finding again showed how adolescents appear to be naive about gambling and tend to overestimate the profitability of gambling and the easiness of winning (Froberg, 2006; Delfabbro et al., 2006a).

Furthermore, an important theme that emerged in the data was gambling and information technology. In fact, adolescents reported that individuals become confident in starting their gambling behaviour because of their perceptions of self-efficacy and their skills achieved during the video gaming experience. Although care should be taken in generalizing these findings, these statements suggest that a risk factor for gambling is their greater familiarity with technology as noted by some researchers (e.g., Griffiths, 1995) that could lead to an over-estimation of the amount of skill in various gambling games. Although some participants emphasised the unpredictable nature of gambling (e.g., they talked about luck in gambling), many participants attributed gambling wins to a significant degree of gambling skill. Such beliefs may facilitate the development of a false sense of confidence that gamblers can exert control over the outcomes in much the same way that they were accustomed to doing when playing video games. These participants' reports suggested both a psychological and behavioural association between gaming and gambling, that has been shown in previous research (e.g. Wood et al., 2004; Griffiths, 1991b; Delfabbro et al., 2009; Gupta and Derevensky, 1996).

In addition, both adolescents and young adults reported that they consider that both activities triggered positive feelings, such as pleasure, adrenaline and excitement. These findings are consistent with previous research that found youth perceive gambling as something exciting and fun (Wood & Griffiths, 2002). Conversely, young adults – despite mentioning that both activities induce positive feelings, as well as other common aspects, such as specific features of the games – were more likely to emphasize the differences between gambling and gaming. This finding may be understood from socio-cognitive development, that is, young adults (due their maturity) can think in more complex ways than adolescents (Selman, 1980), and that adolescents' ability to judge and evaluate a given situation is less developed than adults (Steinberg, 2003).

Overall, the findings in this Portuguese sample are broadly in line with previous research carried out in other countries, such as those in Europe, Australia, and North America including general perceptions about gambling (e.g., Skinner et al., 2004), motivations for gambling (Wood & Griffiths, 2002) and the feelings that are triggered by this activity (Griffiths, 1991a; 2011). More specifically, these findings confirm other studies conducted in England and Belgium which found that one of the main motivations for gambling among youth were winning money and that gambling triggered positive feelings, such as more adrenaline and excitement (Wood & Griffiths, 2002; Zaman et al., 2014). The results of this study are also in line with research carried out in Denmark which showed that gambling was seen as a way to assert social standing and an opportunity to gain prestige by winning (Kristiansen, Reith & Trajberg, 2016). These findings also confirm other research conducted in Canada which showed that for youth, gambling has the main benefit of winning money and that gambling has negative (financial) consequences (Savard, Turcotte & Tremblay, 2018). Moreover, the findings in this Portuguese sample are also in agreement with other studies carried out in Australia showing that gaming and simulated gambling can be a gateway for gambling, and that technology can make gambling more accessible (Pitt, Thomas & Bestman, 2016).

However, some findings of the present study were unique, such as the perception that some online games, such as the MMORPGs could be considered as a gambling activity, because it allows players the chance to win money. Although some studies have emphasised that videogames and social media gambling could act as a learning environment, where people learn the rules of the game (Kim, Wohl, Gupta & Derevensky, 2016), to the present author's knowledge there are no other studies showing that youth considered some online games as a gambling activity.

Furthermore, as the present study interviewed adolescents and young adults and attempted to examine the differences between these two age groups, it found differences in perceptions between adolescents and young adults, in contrast with other studies conducted in other countries. In fact, although both adolescents and young adults reported both negative consequences for gambling, only adolescents reported positive consequences. In addition, although young adults reported that both gaming and gambling triggered positive feelings, and mentioned other similar characteristics between these two activities, this age group (in contrast with adolescents) also emphasised some differences between gambling and gaming

because they mentioned that in gaming there is the possibility of self-improvement, while gambling is more a lonely activity where individuals only attempt to beat other players, and do not cultivate other skills, such as growing as a team. These findings were unique in this Portuguese sample.

This study provided a preliminary understanding of Portuguese adolescents and young adults perspectives relating to gambling. The findings are of substantial interest to various stakeholders in Portugal (and arguably elsewhere) and may have important implications for youth gambling health guidelines, prevention and treatment strategies. Given the apparent differences demonstrated in the two age groups, effective prevention programs could be developed that take into account developmental issues and needs. The results appear to suggest that adolescents are particularly vulnerable to gambling. Therefore, a wide range of stakeholders (e.g., therapists, parents, school workers, teachers, etc.) should be made more aware about this potentially risky behaviour. Adolescents (and their parents and educators) are often given information about other adolescent risk behaviours (e.g., cigarette smoking, drug and alcohol abuse, and unsafe sexual practices), but gambling should also be a risky behaviour that such groups should be educated about. Preventive measures should be carried out among high school students aiming to enhance knowledge about gambling and their risks and to clarify some misconceptions (e.g., the ease in which the money is earned, the probabilities of winning and losing, etc.).

Despite some of the inherent strengths of the present study, several important limitations must be kept in mind in interpreting the results of this research. First of all, the exploratory nature of this research does not allow any definitive conclusions being drawn. Furthermore, the findings were based on self-report data (that are of course subject to many well known weaknesses such as the reliability of memory, social desirability and the honesty of the responses given). However, one of the strengths of this particular methodology is its ability to generate new types of hypotheses and suggestions for future research that are unlikely to be generated from other types of research method.

## **Conclusion**

This study was – to the present author’s knowledge – the first qualitative study (and arguably the first study) – to examine adolescents and young adults in the Portuguese context. More research is needed with these two age groups and longitudinal designs would be helpful, in

order to determine if excessive gambling during adolescence leads to problem gambling and other difficulties reported in empirical literature, such as aggression, delinquency and anti-social behaviours. This study generated important insights about the most popular activities engaged by adolescents and young adults, namely that some online games, such as the MMORPGs can be perceived as a gambling activity. In addition, this study stressed that many participants, mainly adolescents appear to be naive about gambling and tend to overestimate the profitability of gambling and the easiness of winning. Therefore, this finding suggest that cognitive distortions might be an important variable to consider in future quantitative studies of this thesis. However, both adolescents and young adults perceive gambling as an acceptable and fun activity, and both age groups also reported that gambling can trigger positive feelings, such as pleasure and adrenaline. This result suggests that individuals more vulnerable to boredom may be more prone to seek more excitement through gambling activities, which also stresses the relevance to explore the role of sensation seeking in youth problem gambling in future quantitative studies. Furthermore, this study showed that gambling is an activity carried out Portuguese youth.

In addition, after the conduction of this study, Internet gambling was legalized in Portugal, following a trend from other European countries, through the Act of the Parliament 64/2015 ([DL 64/2015]. Moreover, The Portuguese General Directorate for Intervention on Addictive Behaviours and Dependencies (SICAD) recognized gambling an emergent phenomenon and set in its goals the development of a national strategy for these new addictions, in spite the great lack of knowledge on this field (SICAD, 2013). This represents a great gap in research and a lack of ability to approach these issues in an accurate manner in the Portuguese context. Consequently, the present thesis decided to validate and assess the psychometric characteristics of the DSM-IV-J-MR, a widely used instrument to assess youth problem gambling, in an attempt to provide a gambling psychometric to the Portuguese psychological community. The next chapter will present the study concerned the validation of this scale.

## **Chapter 6 – Study 2: Validation of the Portuguese DSM-IV-MR-J**

### **Introduction**

As the previous chapters have elucidated, adolescents are highly vulnerable to gambling (Chambers & Potenza, 2003; Griffiths, 2011) and, at present, gambling is seen as an emergent area of interest both within the fields of adolescent risk behaviour and gambling studies. Despite age prohibitions in many countries all around the world to protect minors from gambling, most empirical research demonstrates that a large proportion of adolescents engage in gambling, with a rate of problem gambling significantly higher than that found in adults (Molinaro et al., 2014). Furthermore, the current generation of youth has grown up in an era where gambling opportunities are widespread and socially acceptable (Volberg et al., 2010; Gupta & Derevensky, 2000).

In addition, the development of technology has generated new forms of gambling via the Internet, mobile phone and interactive television (Griffiths & Parke, 2010). It has also been argued that youth are more receptive to modern forms of gambling than their predecessors because of the apparent similarity between these games and other familiar technology-based games (Delfabbro et al., 2009). As the previous chapter had demonstrated, videogame can act as a gateway for gambling, as adolescents who play videogames and gambling games with virtual money may become inaccurately confident about their skills for playing gambling games, which might encourage them to gamble with real money.

Therefore, given this widespread availability of gambling opportunities, which puts more young individuals at-risk of developing gambling-related problems, there is a growing need to assess problem gambling among adolescents and young adults using the most robust psychometric instruments. In the youth gambling field, one of the most widely used instruments to assess problem gambling among this age group has been the DSM-IV-MR-J (i.e., the juvenile multiple-response version of the DSM-IV criteria for pathological gambling; Fisher, 2000). This instrument has been administered in a significant number of countries (e.g., Great Britain, Canada, Iceland), and there are several studies conducted in different cultural contexts (e.g., Lithuania, Finland), which showed that its psychometric properties are acceptable. However, despite this increase in assessing youth problem gambling in many countries across the world, currently there is no instrument to assess problem gambling among this age group in Portugal.



At present, the Portuguese gambling market comprises lotteries (Lotaria Clássica, Lotaria Popular, Lotaria Instantânea, Totoloto, Totobola), which are owned by the State, as well as casino games, television quizzes, and Internet games (Lopes, 2013). Until recently, online gambling was legally prohibited, but the Government legalized online gambling in April 2015 [Act of the Parliament nº64/2015], in an attempt to generate new sources of income to finance the increasing budget deficits the country currently faces. According to the new Act, the Government will provide licenses, without any kind of exclusivity, to gambling companies that want to operate within Portugal [DL 64/2015].

Research in the gambling field is very scarce in Portugal and there is little published in peer-reviewed journals. However, in the last few years, some studies have been conducted with the aim of increasing the scientific knowledge of this phenomenon, but are only available in Portuguese. For instance, a study conducted by Lopes (2009) with a sample of 3,850 individuals aged 18-70 years found a problem gambling rate of 0.2% using the South Oaks Gambling Screen (SOGS). This study highlighted that gambling was prevalent among older-aged youth, although there was still a great knowledge gap about gambling among this age group and younger teenagers (Lopes, 2009). Another study conducted by Hubert (2015) found that 17% of online problem gamblers (as measured by the SOGS) had between 16 and 20 years.

Although Portugal has an age limit of 18 years to engage in any legal commercial gambling activity, recent news reports about the involvement of underage youth gambling, more specifically on the sports betting game *Placard*, have recently emerged (Spranger, 2016). In addition, as the previous chapter had revealed, underage youth engage in gambling, and hold the belief that gambling can be a lucrative activity (Calado, Alexandre & Griffiths, 2014), which emphasises the need for a psychometric instrument that assesses youth problem gambling in the Portuguese cultural context. Given that there is currently no Portuguese instrument specifically assessing problem gambling among young individuals, the goal of the present study was to adapt to the DSM-IV-MR-J for use in the Portuguese context.

Although there are some divergences in psychometrics, researchers had agreed in considering the reliability and validity for testing the psychometric properties of an

instrument (Salmond, 2008). Reliability refers to the extent to which an instrument produces a consistent result, whereas validity consists in the degree to which the instrument measures what it intends to measure (Blacker & Endicott, 2002).

For examining reliability, a classical approach consists in calculating the internal consistency (Lohr, 2002), and for assessing validity measuring criterion and construct validity have been recommended (Cronbach & Meehl, 1955; Souza, Alexandre & Guirardello, 2017).

The present study, following a similar procedure to that used in the validation of other versions of this scale (e.g., Skokauskas, Burba & Freedman, 2009), and validations of other gambling (e.g., Tolchard & Delfabbro, 2013) and gaming instruments (e.g., Pontes & Griffiths, 2016), assessed the internal consistency, criterion and construct validity.

Criterion validity refers to the extent that a measure is related to some external criterion (Kimberlin & Winterstein, 2008) Typically, there is no “gold standard” criterion for which to assess criterion validity (Lohr, 2002), and criterion variables were chosen from the gambling literature, and also from previous validations of this scale and other gambling instruments. Normally, a method used to assess criterion validity is to examine whether gambling classifications covary with indicators of gambling intensity, such as gambling frequency, and the amount of money spent on gambling. Therefore, these factors were chosen as criterion variables. In addition, delinquency, depression, anxiety, stress and self-esteem were also chosen. These later variables were used because they were found to be associated with problem gambling (Ste-Marie, Gupta & Derevensky, 2006; Sheela, Choo, Goh & Tan, 2015), and used in previous validations of gambling instruments (Tolchard & Delfabbro, 2013), in order to determine if problem gambling constitutes an evidence of broader problems of psychosocial adjustment. Moreover, theoretically it has been argued that delinquency should be positively correlated with problem gambling, as problem gamblers are likely to engage in delinquent behaviours, and gambling problem is likely to be part of a general problem behaviour (Cheung, 2014).

Construct validity is the degree to which a group of variables accurately represents the construct to be measured (Cronbach & Meehl, 1955). For testing the construct validity, a common approach used by researchers is to perform a Confirmatory Factor Analysis (CFA) in order to verify how well the items of a scale represents a particular construct, and thus to test its measurement model (Hair, Black., Babin, Anderson & Tatham, 2009).

Therefore, this study had a number of hypotheses. Firstly, based on the findings from the original validation of the English version of the DSM-IV-MR-J, it was postulated that the measure would have an acceptable internal consistency. Secondly, it was expected that confirmatory factor analysis would reveal a similar factor structure when compared with the original version of the DSM-IV-MR-J and other validations of this scale (e.g., Lithuanian version). Furthermore, it was expected that problem gambling will show positive correlations with delinquency, stress, depression, and anxiety, and a negative correlation with self-esteem; and problem and at-risk gamblers would be more likely to gamble frequently and to spend greater amounts of money.

## **Method**

### ***Participants***

The participants comprised 753 adolescents and young adults (65.5% males, 34.5% females; mean age= 18.9 years,  $SD= 2.6$ ) attending high schools and first years of college in Portugal. Although the sample was not representative of all Portuguese youth, an effort to collect data from several regions of the country was made (i.e., Lisbon, Oporto and Alentejo). In addition, data were collected from adolescents (i) with and without gambling experience attending regular high schools, (ii) attending vocational schools where gambling was thought to be more likely, and (iii) in one youth detention center where gambling was thought to be highly likely. This oversampling procedure has already been used in validations of other gambling instruments (e.g., Hayer, 2014) and had the main aim of creating a higher variance of gambling in the sample in order to better analyze the psychometric properties of the scale. Due to the fact that adolescent problem gambling is a low prevalence phenomenon among the general population, the authors tried to oversample individuals from risk segments with possible gambling experiences to understand the most important items in the factorial structure of this instrument in a new cultural context. This sampling procedure is described in further detail (in Figure 1).

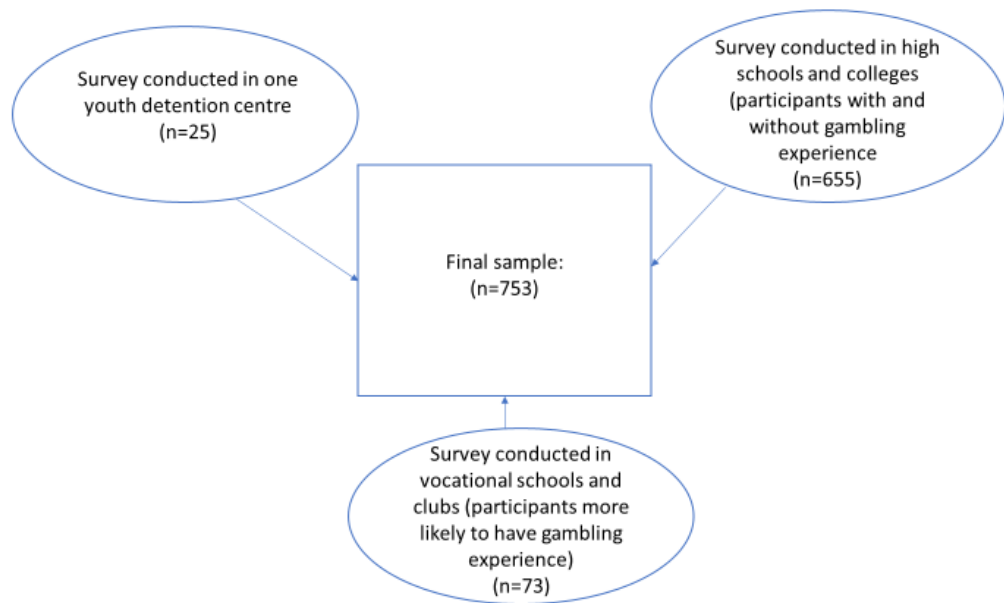


Figure 1 – Sampling procedure employed in the present study

### ***Measures***

#### *Sociodemographics, gambling frequency and money spent on gambling:*

Demographic data were collected on age and gender. Participants were also asked to indicate how often they had gambled during the past year from 1 (“never”) to 6 (“everyday”), as well as the money they had spent on any gambling activity during the previous year from 1 (“had never bet money on gambling”) to 5 (“had spent up to 1000 euros”).

#### *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 adolescent problem gambling among those who had 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, escape, chasing, lies and deception, illegal activities, and family and school disruption. The response categories comprise 1 = “never”, 2 = “once or twice”, 3 = “sometimes” and 4 = “often”. Scoring of criteria 1: often = 1 point, criteria 2–6: sometimes and often = 1 point, and criteria 7–9: once or twice, sometimes and often = 1 point. Total score (range 0–9) was calculated by summing up the scores of all 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 DSM-IV-MR-J instrument has been shown to be reliable and valid among young individuals. In the original version of the DSM-IV-MR-J, the Cronbach's alpha value was 0.75 (Fisher, 2000).

### *Psychosocial measures*

A range of psychosocial measures were also administered in order to assess criterion validity, and included: the Portuguese version of Depression Anxiety and Stress Scale–21 (DASS-21) (Pais-Ribeiro, Honrado & Leal, 2004), a 21-item scale comprising three 7-item subscales rated on a 4-point scale (i.e., 0 = “Did not apply to me at all” to 3 = “Applied to me very much”, or “most of the time”) to assess symptomatology of depression, stress, and anxiety, with Cronbach' alphas of 0.89 (Depression), 0.84 (Anxiety), and 0.88 (Stress) in the present study; The Portuguese version of the Rosenberg Self Esteem Scale (Pechorro, Marôco, Poiares & Vieira, 2011), a 10-item scale with items scored 1= “Strongly agree” to 4= “Strongly Disagree”, with a Cronbach's alpha of 0.89 in the present study; and the Portuguese version of the Adapted Self-Report Delinquency Scale (ASRDS) (Pechorro Vieira, Marôco, Barroso & Gonçalves, 2015), a 35-item scale that assesses self-reported delinquent and antisocial behaviours in youths, rated on a 3-point scale (i.e., 1= “Never” to 3= “Often”), with a Cronbach's alpha of 0.89 in the present study.

### *Procedure*

Translation and back translation of the DSM-IV-MR-J was performed using the following steps (Beaton, Bombardier, Guillemin & Ferraz, 2000): (i) Initial translations from the English language version to the target language (i.e., Portuguese) by the first and second authors, Portuguese native speakers; (ii) synthesis of the translations to resolve discrepancies between both translators; (iii) backward translations of the new target language to English by another translator fluent in Portuguese, who worked independently of stage one; and (iv) review of translations to reach consensus and produce the final version.

For recruiting adolescents, an information letter explaining the purpose of the present study was sent to the headmaster of four high schools, two vocational schools, one youth club, and one youth detention center. 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, an information letter was sent to three public universities in Portugal by the authors. As with

adolescents, only participants who provided their full informed consent participated in this research.

Students 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.

### *Analytic strategy and statistical analyses*

Statistical analysis comprised (i) descriptive analysis for ascertaining the prevalence of problem gambling and the most frequent gambling activities; (ii) assessment of internal reliability using Cronbach's alpha coefficient; (iii) assessment of the criterion validity of the DSM-IV-MR-J by examining its correlation with gambling frequency, amount of money spent on gambling, and the psychosocial measures of depression, anxiety, stress, self-esteem, and delinquency; and (iv) assessment of the construct validity of the DSM-IV-J-MR by means of a confirmatory factor analysis (CFA). All statistical analyses were performed using Mplus 7.2 and IBM SPSS Statistics 22.

## **Results**

### *Descriptive statistics*

A total of 43.2% of participants reported they had gambled less than once a month, 9.1% reported they had gambled once a month, and 14.4% reported they had gambled at least once per week. Based on the DSM-IV-MR-J, 3.5% of participants were categorized as problem gamblers, with a further 9% classified as at-risk gamblers, 53.5% as social gamblers, and 33.3% as non-gamblers. The most frequent gambling activities reported by participants were sports betting (14.9%), scratchcards (14.9%) and lottery games (13.6%). When questioned about online gambling, the most reported gambling games were sports betting (10.6%) and playing the 'free play'/'demo' mode on internet gambling sites (7.8%).

### *Internal reliability*

The reliability of the DSM-IV-MR-J as assessed by the Cronbach's alpha was 0.72 and could not be improved upon deletion of any item. A score of 0.70 or greater is generally considered to be acceptable (Blacker & Endicott, 2002), especially in scales of this size.

### *Criterion validity*

Criterion validity is a comparison of the measure with external validators that are likely to be associated with problem gambling. The DSM-IV-MR-J showed significant correlations with all measures used (see Table 1). More specifically, problem gambling positively correlated with depression, anxiety, stress, and delinquency, and negatively correlated with self-esteem.

Table 1: Relationship between DSM-IV-MR-J and other psychosocial measures

	DSM-IV-MR-J
	r (Spearman)
Self-Report Delinquency	0.39**
Depression	0.20**
Anxiety	0.21**
Stress	0.23**
Self-esteem	-0.13**

\* $p < 0.05$ ; \*\* $p < 0.01$ ; NS=Not Significant

In addition, another way in which criterion validity can be assessed is to examine differences between problem, at-risk, and non-problem gamblers with respect to behaviours related to gambling difficulties but which are not included in DSM-IV-MR-J, such as the frequency of gambling, and the largest amount of money ever gambled in the past 12 months. Therefore, as observed in Table 2 (using chi-square tests), participants who scored as problem and at-risk gamblers were more likely to had gambled more frequently ( $p < 0.0001$ ).

Table 2: DSM-IV-MR-J according to gambling frequency

		DSM-IV-MR-J scores			
		No problem gambling	At-risk gambling	Problem gambling	
Gambling Frequency	Never	N	247	0	0
		% of Total	33.2%	0%	0%
	Less than once per month	N	302	21	0
		% of Total	40.6%	2.8%	0%
	Once per month	N	49	14	4
		% of Total	6.6%	1.9%	0.5%
	Once per week	N	44	10	6
		% of Total	5.9%	1.3%	0.8%
	More than once per week	N	9	22	16
		% of Total	1.2%	3%	2.2%

Table 3 indicates that individuals who scored as problem and at-risk gamblers were more likely to spend a larger amount of money in gambling ( $p < 0.0001$ ).

Table 3: DSM-IV-MR-J scores according to the amount of money spent on gambling

		DSM-IV-MR-J scores			
		No problem gambling	At-risk gambling	Problem gambling	
Amount of money spent on gambling	Never bet money on gambling	N	258	2	0
		% of Total	34.5%	0.3%	0%
	Between less than 1 euro and 10 euros	N	290	22	1
		% of Total	38.8%	2.9%	0.1%
	Between 10 and 100 euros	N	98	17	10
		% of Total	13.1%	2.3%	1.3%
	Between 100 and 1000 euros	N	7	27	15
		% of Total	0.9%	3.6%	2%

### *Construct validity*

Finally, a confirmatory factor analysis (CFA) was performed on the nine items of the instrument to test the previously established one-factor solution of the DSM-IV-MR-J



(Fisher, 2000), through categorical weighted least squares confirmatory factor analysis implemented in Mplus software (Muthén & Muthén, 2004). Conventional fit indices, independent of the sample size, were used to examine the goodness of fit of the model under analysis: root mean square error of approximation (RMSEA), the comparative fit index (CFI) and the Tucker-Lewis index (TLI) (Vandenberg, 2006).

The results indicated that a single-factor model adequately represents the structure of the DSM-IV-MR-J. More specifically, the comparative fit index (CFI) and the Tucker-Lewis index (TLI) were .95 and .93, respectively, and the root mean square error of approximation (RMSEA) was .05, indicating a good fit (Brown, 2015). In addition, factor loadings were all significant ( $p < .001$ ), ranging from .623 to .855 (see Table 4).

Table 4: Standardized factor loadings of the Portuguese DSM-IV-MR-J items

Item	Factor loading
1. In the past year, how often have you found yourself thinking about gambling or planning to gamble	0.647
2. During the course of the past year, have you needed to gamble with more and more money to get the amount of excitement you want?	0.722
3. In the past year, have you ever spent much more than you planned to on gambling?	0.623
4. In the past year, have you felt bad or fed up when trying to cut down or stop gambling?	0.724
5. In the past year, how often have you gambled to help you to escape from problems or when you are feeling bad?	0.752
6. In the past year, after losing money gambling, have you returned another day to try and win back money you lost?	0.730
7. In the past year, has your gambling ever led to: lies to your family?	0.850
8. In the past year, have you ever taken money from the following without permission to spend on gambling: school diner or fare	0.781

	money? Money from your family? Money from outside the family?	
9.	In the past year, has your gambling ever led to arguments with family/friends or others, or missing school?	0.847

## Discussion

The aim of the present study was to validate the Portuguese version of DSM-IV-MR-J and test its psychometric properties. In fact, this study is the first in Portugal to use a youth problem gambling instrument and to provide a prevalence rate of gambling and problem gambling among Portuguese youth. In Portugal, some concerns have been raised about the availability of legal gambling opportunities, especially since the legalization of online gambling in 2015, which may be associated with the prevalence of youth disordered gambling found in the present study. Therefore, it seems crucial to validate instruments to assess gambling-related problems among this age group in Portugal.

Internal consistency reliability of the Portuguese version of the DSM-IV-MR-J was acceptable, especially given the size of this instrument. In fact, the Cronbach's alpha coefficient in the present study (0.72) was very similar to the 0.75 found by Fisher (2000) in the development of the original DSM-IV-MR-J. Moreover, the Cronbach's alpha did not increase upon deletion of any item, and thus provides evidence for a solid internal consistency of the scale.

In addition, construct validation was conducted by means of a CFA. The results of the CFA provided support for the previously established unidimensionality of this instrument as the model fitted the data adequately. Moreover, it should be noted that all items of the DSM-IV-MR-J were statistically significant and relatively high (above the conventional threshold of 0.5), which lends further support to the construct validity of the Portuguese version of the DSM-IV-MR-J, and that all items can be interpreted as symptoms and/or consequences of problem gambling.

In addition, the Portuguese version of the DSM-IV-MR-J showed a statistically significant correlation with other relevant psychosocial variables, which have been found to be

positively associated with problem gambling in the empirical literature, such as delinquency, depression, anxiety and stress (Ste-Marie et al., 2006; Sheela, Choo, Goh & Tan, 2015). Moreover, the DSM-IV-MR-J showed a significant negative correlation with self-esteem, which was in the expected direction and also in line with previous validations of other gambling instruments (e.g., Tolchard & Delfabbro, 2013) and with other studies (Delfabbro et al., 2006b). Although the significant correlations were modest, they appear to lend support to the view that youth problem gamblers may show some clinically significant problems, due to the fact that they occurred in the expected direction. Furthermore, adolescents classified as problem and at-risk gamblers based on DSM-IV-MR-J scores, were significantly different from social gamblers in other aspects. More specifically, problem gamblers and those at-risk gambled more often, and they were significantly more likely than social gamblers to spend higher amounts of money on gambling. These findings are also in line with previous studies of the psychometric properties of the DSM-IV-MR-J in other cultural contexts (e.g., Skokauskas, Burba, & Freedman, 2009; Castren, Grainger, Lahti, Alho & Salonen, 2015).

It is also worth noting that the present study also had some limitations, which should be kept in mind when interpreting the findings. Firstly, a limitation of our study was that classification accuracy of the Portuguese DSM-IV-MR-J was not checked. However, as there are no other instruments to assess youth problem gambling available in the Portuguese language, it was not possible to conduct this analysis. Thus, further investigation of the classification accuracy of the Portuguese version of the DSM-IV-MR-J is needed using a parallel assessment with another instrument. Secondly, the present study exclusively utilized self-report data, which are prone to various well-known biases, such as social desirability and memory recall biases. Furthermore, the sample size was modest and not nationally representative of all Portuguese youth. However, the study did recruit from different segments of young individuals and in different regions of the country, which is an essential procedure for validating a scale in a new cultural context.

## **Conclusion**

The present research provided an important contribution to the study of the psychometric properties of a widely used instrument to assess problem gambling among young individuals in a different country and cultural context. In addition, the present study showed that problem gambling appears to be an issue for some Portuguese youth. It is hoped that the validation

of the DSM-IV-MR-J in the present study will encourage future research concerning youth gambling in Portugal, and will contribute for raising awareness of this phenomenon among Portuguese researchers, clinicians, schools, gaming industry, policymakers, and politicians. This study filled an important gap in the gambling literature, which was the lack of youth gambling instruments in the Portuguese context. The next study that will be presented in the following chapter will also fill other relevant gaps, namely to test a model composed by variables that had received less empirical attention in the literature, such as attachment, as it was pointed out in Chapter 3. As Chapter 5 had elucidated that some youth perceive gambling as a lucrative activity, cognitive distortions were also considered to be an important variable to be included in this model. Therefore, the model that will be tested in Chapter 7 will be composed by a set of individual and family variables in order to examine the predictive power of a set of variables on youth problem gambling.

## **Chapter 7 – Study 3: How coping styles, cognitive distortions, and attachment predict problem gambling among adolescents and young adults**

### **Introduction**

Gambling is an activity that occurs in almost all cultures and across all age periods (Griffiths, 1995). However, the current generation of youth represents a vulnerable age group, given they have grown up in an era where gambling opportunities are widespread (Gupta & Derevensky, 2000). While for most adolescents, gambling is an enjoyable and harmless activity, for a small minority, gambling can become problematic with severe negative consequences (Calado, Alexandre, & Griffiths, 2017a). Therefore, there is a need to study the risk factors underlying youth problem gambling to provide a more comprehensive description of this phenomenon and its onset. In addition, knowledge about risk factors is critical to identify the signs of youth problem gambling, which can be used to improve assessment tools and develop effective preventive initiatives.

Researchers have devoted substantial attention to adolescent gambling and its associated risk factors. Problem gambling is a multifaceted rather than unitary phenomenon (Griffiths, 2011), and consequently, a biopsychosocial approach is needed to the study of this behaviour, as many factors may come into play in various ways and at different levels that contribute to the acquisition, development, and maintenance of gambling-related problems. These factors can be conceptualized using an ecological model (Bronfenbrenner & Morris, 1998), which addresses individual risk factors, as well as interpersonal and community factors that create the conditions for the development of youth gambling problems (Shead et al., 2010).

At the individual level, as it was already pointed out in Chapter 3, most research has consistently found that gender is a risk factor for adolescent gambling problems. In fact, gambling is much more common among males than females (Kristiansen & Jensen, 2014), and males are more vulnerable to develop gambling-related problems (Bastiani et al., 2013; Dodig, 2013; Olason et al., 2011). In addition, at the individual level, some empirical research has examined cognitive distortions (e.g., Ariyabuddhiphongs, 2013; Griffiths, 1994; Tang & Wu, 2012). According to some research, adolescent problem gamblers have erroneous beliefs about the independence of random gambling events and tend to

overestimate their chances of winning (Delfabbro et al., 2006a; Froberg, 2006; Turner et al., 2008).

Moreover, coping styles, which can be conceptualized as the way in which individuals deal with life circumstances, and regarded as a function of personality and experience (Sheard et al., 2010), are also an important risk factor for the acquisition and maintenance of youth gambling problems. Such coping styles have been categorized into those intended to directly act on the stressor (i.e., task-oriented or problem-focused coping) and those intended to regulate emotional states associated with or resulting from stressful life events (i.e., emotion-oriented coping; Endler & Parker, 1990; Folkman & Lazarus, 1985). For instance, a study conducted by Gupta et al. (2004) reported that adolescents who gamble excessively exhibit coping styles that are more emotion-based. Bergevin et al. (2006) also found that students aged between 11 and 20 years with gambling-related problems used less task-focused coping and more avoidance focused coping strategies.

Some research also places importance on attitudes in predicting adolescents' gambling (e.g., Jackson, Dowling, Thomas, Bond, & Patton, 2008; Moore & Ohtsuka, 1999). In an Australian sample of 505 adolescents, Delfabbro and Thrupp (2003) found that more frequent gambling was associated with more pro-gambling attitudes. Similarly, a study carried out by Wood and Griffiths (2004) with 1,195 adolescents aged between 11 and 15 years showed that attitudes were an accurate predictor of adolescent gambling behaviour when playing the National Lottery and scratchcards. Furthermore, a qualitative study conducted by Calado, Alexandre, and Griffiths (2014) demonstrated that adolescents displayed a positive attitude toward gambling behaviour, and that gambling was associated with positive outcomes (e.g., more entertainment and a better life due to the money won).

It has also been shown that adolescent gambling behaviours are associated with numerous family characteristics, which can be conceptualized as family composition and parent-adolescent relationship characteristics (McComb & Sabiston, 2010). In fact, previous research has found that a low-quality attachment to parents or other attachment figures have an influence in the initiation of other adolescent risky behaviours, such as drug use and delinquent behaviours (e.g., Kuntsche & Kuendig, 2006; Miller et al., 2009). Although not widely studied by gambling researchers, there was some preliminary evidence that attachment plays an important role in adolescent gambling behaviours (Magoon & Ingersoll,

2006), which highlights the need for further research on this specific variable. This study examined 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 specific family variables in this behaviour (McComb & Sabiston, 2010).

In addition to attachment, some researchers have also noted that family composition, such as living with parents, might serve as a factor that might protect adolescents from engaging in this risky behaviour (Hayer & Griffiths, 2015). On the other hand, other empirical studies have reported that family configuration is not associated with adolescent gambling behaviour (e.g., Langhinrichsen-Rohling et al., 2004). In fact, little empirical attention has been given to the relationship between family sociodemographic characteristics and adolescent gambling behaviours. This is despite the fact that they appear to be important variables in studying the context of gambling behaviour because ecological models of health behaviour recognize family demographic characteristics as determinants of health conduct (Flay & Petraitis, 1994).

Although there is a growing body of literature on risk and protective factors, there is still a lack of consensus regarding the relative weight of each factor in contributing to problem gambling among youth (Shead et al., 2010). In fact, it is still unclear which variables (biological, cognitive, and family) play a more significant influence in the development of youth problematic gambling. Further research is needed to clarify the complex functional relationships between specific variables and to incorporate the individual and family predictors into a comprehensive and testable etiological model. Consequently, this study tested a model in which biological, cognitive, and family variables are integrated, weighting the contribution of each factor, and provided further insights into the mechanisms of these variables, by examining how these variables can interact and influence each other in the development of youth problematic gambling behaviour.

Two sets of analysis were conducted. In the first set of analyses, the predictive power of a set of variables on gambling was examined (including gender along with cognitive, personality, and family factors), weighing the specific contribution of each predictor. This is in line with the biopsychosocial approach for the study of gambling, which postulates that it results from the interaction between individual and interpersonal factors. Therefore, the present study attempted to overcome previous research that mainly examined these

predictors separately. In addition, this study overcomes the lack of research concerning family variables, namely the role of attachment to parents or other attachment figures in the emergence of youth gambling-related problems. It was hypothesized that biological, cognitive, and family variables would show different weights in predicting problem gambling among young individuals. The model hypothesized comprised the following. First, the starting model examined gender, and it was predicted that male gender would show a significant positive effect on youth problem gambling. Second, the individual predictors of cognitive distortions, attitudes, and coping were added to the model. It was predicted that these variables would show a significant association with youth problem gambling.

Finally, the family variables of attachment and family structure were added to the model, and based on previous literature, it was predicted that attachment to parents would show a significant influence on youth problem gambling, whereas family structure would not have a significant predictive effect on this behaviour. Based on this first set of analyses, a new model was hypothesized examining how individual and family variables influence each other in predicting youth problem gambling. The second set of analyses tested the hypothesized model, to provide further insights on the relationship between different types of variables that have a predictive role in the emergence of youth problem gambling.

## **Method**

### ***Participants and procedure***

The participants comprised 988 adolescents and young adults (59.2% males, 40.8% females; mean age=19.8 years, SD=2.0) attending high schools and the first year of college in the Nottinghamshire area of the UK. The data were collected using standard questionnaires, completed on a voluntary basis in the school or college.

### ***Measures***

*Sociodemographic information and gambling frequency:* Sociodemographic data were collected on age, gender, and family structure (participants had to indicate with who they lived, i.e., if they lived with both birth parents, in a single-parent family, or with other family members). Participants were also asked to indicate how often they had gambled during the past year from 1 (“never”) to 6 (“everyday”).



*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. The original validation of this scale revealed good levels of construct validity. 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". However, although each item has four response options, it receives a dichotomous scoring of 0 or 1 depending on the response choice (for instance, in the item 1, if an individual chooses the option "often", he/she will receive a score of 1, but if he chooses any of the other options, he/she will receive a score of 0). 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. Cronbach's alpha for the instrument in the present study was 0.82.

*Gambling related cognitions scale (GRCS)*: The 23-item GRCS was developed by Raylu and Oei (2004) to assess gambling-related erroneous cognitions. It comprises five sub-scales answered on a 7-point Likert scale, each one assessing a different type of cognitive distortion: *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). This scale has been extensively used, and its original validation demonstrated satisfactory psychometric properties. Higher scores on the GRCS indicate higher levels of irrational belief. Cronbach's alpha for the instrument in this study was 0.94.

*Brief Coping Inventory*: The 'brief COPE' developed by Carver (1997) is a short form of the original COPE inventory developed by Carver, Scheier and Weintraub (1989) and assesses different coping styles. This instrument comprises 14 sub-scales, each one measuring a different coping style: active coping, planning, positive reframing, acceptance, humour, religion, using emotional support, using instrumental support, self-distraction, denial, venting, substance use, behavioural disengagement and self-blame. The original validation

of this scale conducted by Carver (1997) reported adequate psychometric properties, and replicated the factor structure found in the longer version of this instrument. For the present study (as used previously by Reinecke [2009]), the scores of the active coping and planning subscales were combined to form a single index for problem-focused coping, whereas the scores of the self-distraction and the denial subscales were combined to form an index of emotion-focused coping. The items of the problem-focused coping describe strategies that comprise problem solving (e.g., “I concentrate my efforts on doing something about the situation I’m in”), and the items for the emotion-focused coping describe strategies that are directed to the regulation of emotions caused by the stressor (e.g., “I turn to work or other activities to turn my mind off things”). Participants were instructed to respond how often they reacted in the respective way when facing a problem on a Likert scale from 0 (Never) to 3 (Frequently). Cronbach’s alphas for the subscales in the present study was 0.86 for the problem-focused subscale and 0.72 for the emotion-focused subscale.

*Attitudes Towards Gambling Scale (ATGS):* The ATGS-8 is an instrument that was developed for the 2010 British Gambling Prevalence Survey by Wardle et al. (2011) to assess individuals’ attitudes towards gambling. Previous validations of this scale with English samples confirmed its good concurrent validity. The scale comprises 8 items with responses given on a 5-point Likert scale. Higher scores indicate more positive attitudes towards gambling. Cronbach’s alpha for the instrument in the present study was 0.75.

*Adolescent Attachment Questionnaire (AAQ):* The AAQ developed by West, Rose, Spreng, Sheldon-Keller and Adam (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 original validation of this scale demonstrated satisfactory psychometric properties. 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 is related 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’s concept that secure attachment bonds are characterized 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). In this instrument, 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. The total scale showed a Cronbach's alpha of 0.88.

### ***First set of analyses***

#### *Statistical analysis (1)*

For the first set of analyses, descriptive statistics were performed to report the gambling habits, and gambling activities most played by participants. To identify the predictive factors for at-risk and problem gambling, a series of hierarchical logistic regressions were conducted using gender, cognitive distortions, attitudes, coping, attachment and family structure as independent variables. In accordance with Potenza et al. (2011), the dependent variable in this logistic regression was the combination of at-risk and problem gambling, and was compared against non-problem gamblers (social and non-problem gamblers). Multicollinearity diagnostics using tolerance and variance inflation factor (VIF) revealed no multicollinearity among the predictors in the model.

### ***Ethics***

Parental permission to participate was given for those students aged under 18 years and informed consent from all participants was obtained. 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 research team's university ethics committee provided approval for the study.

## **Results (Part 1)**

### ***Descriptive analysis of gambling habits and activities***

The results indicated that 79.4% of students had gambled during the past year. The most frequent gambling activities reported by participants were sports betting (15.4% of respondents reported they gambled this activity often), scratchcards (14.7%), and instant win games (10.7%). When questioned about online gambling, the most frequent gambling

activities were sports betting (24.8%), gambling in social networking sites (7.2%), and blackjack (5.7%).

On the basis of the DSM-IV-MR-J criteria (Fisher, 2000), 20.4% of the participants were classed as non-gamblers, 64.6% as social gamblers, 8.8% as at-risk gamblers, and 6.2% as problem gamblers.

### ***Model for predicting youth problematic gambling***

In the first regression analysis, the starting point was a model in which gender was the only predictor of the dependent variable (Model 1; see Table 1). This model classified 85.1% of respondents. In a second step, the cognitive distortions were added to the model (Model 2). Comparing Model 1 and Model 2, the chi-square difference was significant, and justified the introduction of this variable. Model 2 correctly classified 86.9% of the respondents. In Model 3 attitudes were added. Comparing Model 2 and Model 3, the chi-square difference was not significant. Finally, the remaining variables were individually added in subsequent steps to the model, and in each step the chi-square significance was verified. Results indicated that the percentage of correctly classified respondents grew from 85.1 to 88.2 (see Table 1). In the final model the predictors were gender, cognitive distortions, attitudes, coping, attachment and family structure (Model 6).

The specific weight of each predictor is reported in Table 2. In addition, cognitive distortions showed a positive significant relationship with problematic gambling. Emotion-focused coping showed a significant positive relationship with problematic gambling, whereas problem-focused coping exhibited a negative significant relationship. Attitudes, attachment and family structure did not show a significant relationship with problematic gambling.

Table 1. Hierarchical logistic regression analysis with problematic gambling behaviour (problem gambling/at-risk gambling) as the dependent variable (N=988)

<b>Model</b>	<b>-2log</b>	<b>Correct classification</b>	<b>Model comparison</b>	<b>Δ -2log</b>	<b>P</b>
Model 1: Gender	765.554	85.1%		-	-
Model 2: Model 1+ Cognitive distortions	591.336	86.9%	Model 2-Model 1	174.218	<0.001
Model 3: Model 2 + Attitudes	590.808	86.9%	Model 3-Model 2	0.528	0.468
Model 4: Model 3 + Coping	544.081	87.9%	Model 4-Model 3	46.728	<0.001
Model 5: Model 4 + Attachment	543.995	87.9%	Model 5-Model 4	0.085	0.770
Model 6: Model 5 + Household	539.369	88.2%	Model 6-Model 5	4.626	0.201

Table 2. Regression coefficients of logistic regression with problematic gambling behaviour (problem gambling/at-risk gambling) as the dependent variable (N=988)

<b>Predictors</b>	<b>B</b>	<b>SE</b>	<b>Wald</b>	<b>Df</b>	<b>P</b>	<b>OR</b>
Gender	-1.37	0.28	24.16	1	<0.001	0.26
Cognitive distortions	1.18	0.13	89.1	1	<0.001	3.26
Attitudes	0	0.02	0.00	1	0.986	1
Problem-focused coping	-0.12	0.04	7.645	1	<0.01	0.89
Emotion-focused coping	0.24	0.04	35.39	1	<0.001	1.27
Attachment	0.05	0.16	0.09	1	0.764	1.05
Living with father	0.19	0.47	0.17	1	0.69	1.21

Living with mother	-0.58	0.31	3.5	1	0.06	0.56
Living with other family members	-0.32	0.30	1.12	1	0.29	0.73

***Second set of analyses***

The second set of analyses attempted to provide further insights in the relationship between the variables examined. The first set of analyses demonstrated that the individual factors of gender, cognitive distortions, and coping had a significant predictive effect on youth problematic gambling (problem and at-risk gambling). The family predictors of attachment and family structure did not show a significant predictive effect on youth problematic gambling. These findings suggest that family variables do not have a direct impact in the emergence and maintenance of gambling behaviour among young individuals, and contradict previous research on youth risky behaviours showing that a low level of attachment to parents or other attachment figures has a significant direct effect on adolescents' alcohol consumption (Kuntsche & Kueding, 2006), substance use (Bahr, Hoffman & Yang, 2005; Kopak, Chen, Haas & Gillmore, 2012), and deviant behaviour (Miller et al., 2009).

In addition, lower levels of attachment have been associated with more avoidant coping strategies (Seiffge-Krenke & Beyers, 2005), which showed a significant influence on problem gambling in the first set of analyses. In fact, some authors have argued that attachment theory should be an important base for understanding the origin of coping strategies (e.g., Howard & Medway, 2004; Seiffge-Krenke, 2011). Adolescents securely attached to parents or to other attachment figures may develop a more positive self-image in the long term, may be able to better manage stressful experiences, and develop more appropriate coping styles, such as problem-focused coping (Blomgren, Svahn, Åström & Rönnlund, 2016).

Consequently, the second set of analysis tested a model to see if coping strategies could mediate the relationship between attachment and gambling behaviour, and therefore advance knowledge on the influence of specific variables in youth problem gambling. In order to further understand how these variables can impact each other, the three attachment

dimensions of angry distress, availability, and goal corrected partnership, comprising the three subscales of the Adolescent Attachment Questionnaire are considered. Therefore, based on the analysis above and previous literature showing a positive relationship between attachment and more healthy coping strategies, it was hypothesised that: (i) attachment dimensions would not have a significant direct effect on youth problem gambling; (ii) the negative attachment dimension of angry distress would have a significant indirect effect on youth problem gambling, through emotion-focused coping style and problem-focused coping style; and (iii) the positive attachment dimensions of availability and goal corrected partnership would have a significant indirect effect on youth problem gambling, through emotion-focused and problem-focused coping style.

### *Statistical analysis (2)*

In the second set of analyses, structural equation modelling (SEM) was used to assess the structural relationships between the predictor, mediator, and outcome variable. Taking into account that the outcome variable assessed by the DSM-IV-MR-J is a dichotomous variable, the WLSMV estimator implemented in Mplus was used (Muthen & Muthen, 2015). The two-step approach to SEM recommended by Anderson and Gerbing (1988) was used by testing the measurement model in the first step and then the structural model in the second step. Conventional fit indices, independent of the sample size, were used to examine the goodness of fit of the model under analysis: root mean square error of approximation (RMSEA), the comparative fit index (CFI) and the Tucker-Lewis index (TLI) (Vandenberg, 2006).

### **Results (Part 2)**

The means, standard deviations, and correlations between all the variables that will be included in the model are outlined in Table 3.

Table 3. Mean, SD, and correlations between all the attachment dimensions, copying styles and problem gambling

	M	SD	1	2	3	4	5	6
<b>1. Angry distress</b>	1.90	0.93	–	0.526**	0.385**	-0.091**	0.205**	0.057
<b>2. Availability</b>	2.10	0.92	0.526**	–	0.616**	-0.205**	0.093**	0.025
<b>3. Goal corrected partnership</b>	1.81	0.75	0.385**	0.616**	–	-0.244**	-0.006	0.041
<b>4. Problem-focused coping</b>	7.44	2.92	-0.091**	-0.205**	-0.244**	–	0.049	-0.149**
<b>5. Emotion-focused coping</b>	4.34	2.86	0.205**	0.093**	-0.006	0.049	–	0.202**
<b>6. Problem gambling</b>	0.72	1.55	0.057	0.025	0.041	-0.149**	0.202**	–

\*\* Correlation significant at the  $p < 0.01$  level

### *SEM with latent constructs*

The criteria for a very good model fit for these goodness-of-fit indices were defined by CFI  $\geq 0.95$ ; TLI  $\geq 0.95$  (Hu & Bentler, 1999), and RMSEA  $< 0.06$  for binary or ordered categorical variables (Yu & Muthen, 2002). Therefore, in the first step, the measurement model showed a very good model fit: CFI=0.968; TLI= 0.963; RMSEA=0.031.

In the second step, the structural model was tested. In order to examine mediation, bootstrapping procedures were conducted to determine the indirect effect (Preacher & Hayes, 2004). The bootstrapping procedure has advantages over Baron and Kenny's (1986) traditional approach and Sobel's (1982) test because it does not assume normality of the sampling distribution of the indirect effects, and it has higher power while maintaining adequate control over Type I error rate (MacKinnon, Lockwood, Hoffman, West & Shets, 2002; Preacher & Hayes, 2008). The bootstrap estimates were based on 1,000 bootstrap samples. An indirect effect was considered to be significant if its 95% Bias Corrected and Accelerated (BCa) bootstrap CIs from 1,000 bootstrap samples exclude zero (Fritz, Taylor, & MacKinnon, 2012). The full structural model again showed a very good model fit: CFI=0.969; TLI= 0.965; RMSEA=0.030.



The direct path from attachment dimensions to problem gambling was non-significant. As noted above, the attachment dimensions of availability and goal corrected partnership were reversed, so higher scores on these dimensions reveal low levels of availability and goal corrected partnership respectively. The direct path from emotion-focused coping to problem gambling was positively significant and the direct path from problem-focused coping was negatively significant (see Table 4). Therefore, the first hypothesis was fully supported.

In addition, results relating to the second hypothesis indicated that the total effect from the attachment dimension of angry distress to problem gambling was significant ( $b=0.35$ ;  $SE=0.12$ ;  $p<0.05$ ). The results also showed that the total indirect effect was also significant ( $b=0.12$ , 95% BCa CI= 0.03; 0.19). Examining the indirect effect, the results indicated that the specific indirect effect from angry distress to problem gambling through emotion-focused coping was significant ( $b=0.13$ , 95% BCa CI=0.06; 0.20). However, as noted in Table 4, the direct effect from angry distress to problem gambling was not significant ( $b=0.24$ ;  $SE=0.15$ ;  $p=0.11$ ). Therefore, these results indicate that emotion-focused coping fully mediated the relationship between angry distress and problem gambling. Moreover, the results indicate that the specific indirect effect from angry distress to problem gambling via problem-focused coping was not significant ( $b=-0.01$ , 95% BCa CI= -0.06; 0.02). Consequently, the second hypothesis was partially confirmed (see Figure 1 for the significant indirect path from angry distress to problem gambling).

Results for the third hypothesis indicated that the total effect from availability to problem gambling was not significant ( $b=-0.197$ ;  $SE=0.19$ ;  $p=0.31$ ). The total indirect effect was not significant either ( $b=0.03$ , 95% BCa CI= -0.05; 0.16). With regard to the attachment dimension of goal corrected partnership, the total effect from this dimension to problem gambling was non-significant ( $b=0.07$ ;  $SE=0.14$ ;  $p=0.60$ ). In addition, the total indirect effect from goal corrected partnership to problem gambling, via the two coping styles was not significant either ( $b= -0.04$ ; 95% BCa CI= -0.14; 0.04). Therefore, these results suggest that there is no mediation of coping styles in the relationship between the attachment dimensions of availability and goal corrected partnership and problem gambling. This model accounted for a total of 22% of the variance in problem gambling, 14.6% of the variance in emotion-focused coping, and 4.3% in the variance of problem-focused coping.

Table 4. Direct paths to all dependent variables in the study (unstandardized regression coefficients)

Direct paths to problem gambling		B	SE	P
Angry	→ Problem gambling	0.24	0.15	0.11
Availability	→ Problem gambling	-0.22	0.27	0.41
Goal correct partnership	→ Problem gambling	0.11	0.199	0.58
Emotion-focused coping	→ Problem gambling	<b>0.92</b>	<b>0.24</b>	<b>&lt;0.001</b>
Problem-focused coping	→ Problem gambling	<b>-0.23</b>	<b>0.06</b>	<b>&lt;0.001</b>
Direct paths to emotion-focused coping				
Angry	→ Emotion-focused coping	<b>0.14</b>	<b>0.06</b>	<b>&lt;0.05</b>
Availability	→ Emotion-focused coping	-0.00	0.08	0.97
Goal corrected partnership	→ Emotion-focused coping	-0.07	0.05	0.20
Direct paths to problem-focused coping				
Angry	→ Problem-focused coping	0.05	0.11	0.62
Availability	→ Problem-focused coping	-0.12	0.24	0.62
Goal corrected partnership	→ Problem focused-coping	-0.12	0.20	0.56

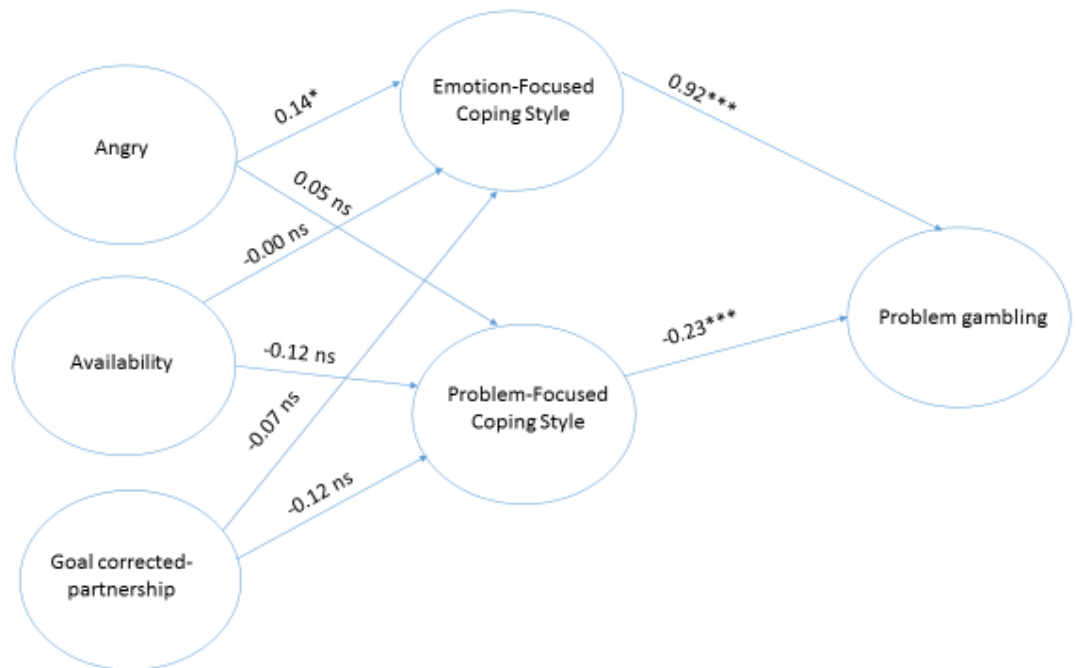


Figure 1: Indirect effects from the three attachment dimensions to problem gambling

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## **Discussion**

The present study explored the effect of individual and family predictors upon problem gambling, and examined the relationship between some individual and family variables in the prediction of problem gambling among a student sample. The first set of analyses showed that a model composed of individual and family factors together adequately explained youth problematic gambling. The second set of analyses demonstrated that attachment dimensions do not have a significant direct effect on problem gambling among young individuals, and that the attachment dimension of angry distress exerted a significant indirect influence on youth problem gambling.

The findings of the first set of analyses are in line with other research (e.g., Griffiths, 2011), which asserts that gambling is a multidimensional (rather than a unitary) phenomenon, and therefore many factors may come into play in the acquisition, development and maintenance of gambling-related problems. Within this integrated perspective, the most significant variables for predicting youth problem gambling were male gender, cognitive distortions, and emotion-focused coping. These findings are also in line with previous research showing that problematic gambling behaviour is more prevalent among males (e.g., Bastiani et al., 2011; Griffiths, 2011, Skokauskas & Satkeviciute, 2007), associated with erroneous beliefs of randomness (e.g., Delfabbro et al., 2006a; Griffiths, 1994) and with emotion-focused coping (e.g., Bergevin et al., 2006). However, in the present study attitudes did not show a significant predictive effect on youth problematic gambling, contradicting previous research highlighting the impact of this variable in predicting gambling-related problems among young individuals. Therefore, more research into the effect of attitudes on youth gambling is needed among diverse samples, in order to understand the meaning of gambling-related attitudes in different cultural contexts and its influence in the emergence of this behaviour.

The first set of analyses also showed that the family predictors of attachment to parents or other attachment figures, and family structure did not show a significant effect on youth problem gambling. These findings confirm other studies showing that family structure does not have a significant impact on youth problem gambling (e.g., Langhinrichsen-Rohling et al., 2004), but contradicts other studies showing that attachment has a significant effect on other adolescent risky behaviours (e.g., Bahr, Hoffman & Yang, 2005). Consequently, these findings suggest that attachment to parents or other attachment figures may have an indirect association on youth problematic gambling via other individual variables. As previous

research has demonstrated that attachment has an influence on coping strategies (Seiffge-Krenke & Beyers, 2005), and that a primary function of interpersonal attachment is the regulation of emotions (McNally, Palfai, Levine & Moore, 2003), the second set of analyses examined if coping styles mediated the relationship between attachment to parents and problem gambling.

In order to better understand the complex relationships between these variables, the second set of analyses examined the three dimensions of attachment (angry distress, availability, and goal corrected partnership). The findings indicated that none of these dimensions had a significant direct effect on problem gambling. However, the attachment dimension of angry distress exerted a significant indirect effect on problem gambling via emotion-focused coping, and which fully mediated the relationship between angry distress and problem gambling. Problem-focused coping did not exert any mediation in the relationship between angry distress and problem gambling. In addition, the other attachment dimensions of availability and goal corrected partnership did not exert any significant indirect effect on youth problem gambling via any coping style. Therefore, these results suggest that the attachment dimension of angry distress, characterized by feelings of anger towards attachment figures when attachment needs are frustrated (West et al., 1998), has a significant association with with the emotion-focused coping, characterized by strategies of regulating emotions caused by the stressor. This, in turn, will exert an influence in the development of gambling-related problems among young individuals. Although there was some preliminary evidence that attachment plays a role in adolescent gambling behaviours (Magoon & Ingersoll, 2006), these findings extend the previous gambling literature by examining how different attachment dimensions can exert an effect on youth problem gambling via coping styles, and by showing that the attachment dimension of angry distress indirectly influenced this behaviour via an emotion-focused coping style.

The findings of the present study have some important implications for clinical practice and prevention. In fact, it seems that a low quality relationship with parents or other attachment figures may lead children and adolescents to learn less suitable strategies to deal with their life difficulties, such as using gambling in order to escape from their problems (Wood & Griffiths, 2007). Therefore, in a clinical context with young problem gamblers, therapists should assess the quality of the parent-child relationship, namely potential feelings of anger that adolescents might feel towards their parents when their needs are unfulfilled, and must

include parents or other attachment figures in the therapeutic process. In addition, during preventive initiatives, parents should also be trained about their abilities and aptitudes that could foster the development of a positive relationship with their children.

Furthermore, during gambling prevention initiatives, more effective coping strategies to deal with life difficulties and everyday challenges should be taught. More specifically, students should be educated that is more adaptive to use task-oriented or problem-focused coping strategies, which are intended to directly act on the stressor, and that emotion-focused coping strategies should be used within situations in which there is no control, such as the loss of a loved one. However, in these situations where emotion-focused coping may be more adaptive to use, students should be educated to use healthier strategies to try to reduce the negative emotional responses associated with stress such as embarrassment, fear, anxiety, depression, excitement, and frustration. This may include practising some meditation and mindfulness, and emotional disclosure, which involves expressing negative emotions by writing about the events which occasioned such emotions.

Although this study has some strengths, such as a relatively large sample size and the examination of previously unexplored relationships between attachment dimensions, coping styles, and problem gambling, it has also some limitations. These should be kept in mind when interpreting the findings. Most importantly, the present study exclusively utilized self-report data, which are prone to various well known biases, such as social desirability and memory recall biases. Secondly, the study was conducted among a student sample recruited in England, and therefore generalizability to other populations is limited. Thirdly, this study used a cross-sectional design, and thus possible causal relationships between variables cannot be inferred.

## **Conclusion**

Despite these limitations, the present study, as far as the authors are aware, is the first to examine the mediation effect of coping styles in the relationship between attachment and problem gambling. This confirms that the indirect effects of family variables are important in estimating the complex social forces that may influence adolescent decisions to gamble. However, there is a need for replication of these results in longitudinal designs. Taking into account that youth problem gambling has several negative consequences, longitudinal studies, as well as investigations carried out in other contexts, could be of great utility in

minimizing these outcomes. Moreover, future studies should be conducted in other countries in different contexts in order to extend the present findings to other youth populations. Therefore, to respond to this need for conducting more gambling research in different cultural contexts, the study that will be presented in the following chapter will test a model to predict problem gambling in two different cultural contexts, Portugal and England. As the qualitative study presented in Chapter 5 indicated that both adolescents and young adults reported that gambling can trigger positive feelings, such as pleasure and adrenaline, and that young individuals use gambling as a way to get more excitement when they feel more bored, sensation seeking was thus considered to be a relevant variable to be included in the model that will be tested in Chapter 8.

## **Chapter 8 – Study 4: Gambling among adolescents and emerging adults: A cross-cultural study between Portuguese and English youth**

### **Introduction**

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 more generally (King et al., 2010). As Chapter 2 illustrated, 0.2-12.3% of youth meet the criteria for problem gambling, notwithstanding differences among assessment instruments, cut-offs, and timeframes (Calado, Alexandre & Griffiths 2017a). 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 biopsychosocial model that incorporates individual, family, and macro-level 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 (Diskin & 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, Derevensky and Ellenbogen (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 likely 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 & 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 & Nigro, 2015). Considering young individuals, 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 (Joukador, Maccallum & Blaszczynski, 2003; Wood & Griffiths, 2004) and also display a more optimistic thinking about gambling as a way for generating income (Splevins, Mireskandari, Clayton & Blaszczynski, 2010). Furthermore, interpersonal and financial consequences of gambling have been predicted by a poorer understanding of chance and probability, and by having more superstitious beliefs (Ricijas, Hundric & Huic, 2016).

In addition to individual factors, youth gambling behaviours are associated with numerous family characteristics (Hayer & Griffiths, 2015). As it was explained in Chapter 3, according to McComb and Sabiston (2010), the family influences on adolescent gambling behaviour can be conceptualized 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 & Ingersoll, 2006), although the mechanisms of the effect on this variable in youth problem gambling needs further exploration.

In fact, it has been suggested that sensation seeking has a negative relationship with attachment security to mothers and fathers (Serracino, Presaghi, Degni & Innamorati, 2011; Curcio, Mak & George, 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, Teichman & Rahav, 1992). In contrast, insecurely attached adolescents may be more likely to develop a personality trait characterized 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, that could compromise their healthy development (Curcio et al., 2017). However, the association between attachment and sensation seeking has also received limited attention in the empirical literature. As it was previously mentioned, there is a lack of research that explored the relationship between attachment and youth gambling behaviour, and thus, the present study examines the effect of attachment to parents or other attachment figures in youth problem gambling. As there is some evidence that there is an association between sensation seeking and attachment, and as the previous chapter had demonstrated that attachment plays an indirect influence on youth problem gambling, the present study 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 (Molinario 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 individuals from other cultural backgrounds (Kun et al., 2012).

In addition, individuals from different cultural backgrounds are exposed to distinct life circumstances and receive unique cultural values and belief systems, that could influence the development of different gambling cognitions (Tang & Oei 2011). For instance, Papineau (2005) postulated that Chinese individuals perceive fate as something unavoidable, and gambling might be interpreted according to Chinese traditions. Consequently, the outcome of a game is used to extrapolate individuals'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 United Kingdom, found that the Chinese exhibited significantly less probabilistic thinking, and displayed higher levels of risk taking in gambling.

Culture has also been recognized as a variable that can have an important influence in the development of an individual's personality traits (Schmitt, Realo, Voracek & Allik, 2008; Triandis & 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 sensation seeking trait on behavioural intentions (Lu, Chi & Lu, 2017). These findings highlight the need to examine the effect of this variable in different cultural contexts.

Furthermore, Rothbaum, Weisz, Pott, Miyake and Morelli (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 is very different in Japan and United States. 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 minimize 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 United States, responsiveness has more to do with meeting children's need to assert their personal desires and, wherever possible, respecting children's autonomous efforts to satisfying 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 & 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 association between attachment and 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 this author's 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 & 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 1,137 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 who they lived, i.e., if they lived with both birth parents, in a single-parent family, or with other members, such as partners, friends, flatmates), and parents' qualifications. Participants were also asked to indicate how often they had gambled during the past year from 1 ("never") to 6 ("everyday").

*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. The original validation of this instrument revealed adequate psychometric properties. 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". 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 Portuguese version of this scale that was validated in Chapter 6 (Calado, Alexandre & Griffiths, 2016) for the Portuguese sample. The 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. The original validation of this instrument revealed a satisfactory criterion validity and an acceptable reliability. 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. For the English sample, the Cronbach's alpha for the total scale was 0.94 and for the Portuguese sample it was 0.96. For each sub-scale of the GRCS, the Cronbach's alpha for the English sample ranged from 0.77 to 0.88, and for the Portuguese sample, it ranged from 0.74 to 0.86 (see below).

*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 original validation of this instrument revealed satisfactory psychometric properties. 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's concept that secure attachment bonds are characterized 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. The Cronbach's alpha of the scale for English sample was 0.88, whereas for the Portuguese sample it was 0.83. For each sub-scale of the AAQ, the Cronbach's alpha for the English sample ranged from 0.81 to 0.86, and for the Portuguese

sample, it ranged from 0.68 to 0.76 (see below). In fact, among the Portuguese sample, the Cronbach's alpha for one sub-scale was below than 0.70, but most researchers argue that values under 0.70, but close to 0.60 are satisfactory (e.g., Streiner, 2003). In addition, the reliability obtained for this sub-scale was also very similar to the value obtained by Ribeiro and Sousa in the original validation of this scale to Portuguese (Ribeiro & Sousa, 2002).

*Brief Sensation Seeking Scale (BSSS)*: This instrument was developed by Hoyle, Stephenson, Palmgreen, Lorch and Donohew (2002) and assessed sensation seeking. Psychometric analysis of the original version of this instrument revealed suitable item characteristics and an adequate internal consistency. This scale 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. The 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 summarizes demographics and descriptive statistics for Portuguese and English participants.

Table 1. Demographics background of participants

	Portuguese youth		English youth		Chi-Square
<b>Gender</b>	N	%	N	%	
Male	256	46.4%	338	57.8%	14.79**
Female	296	53.6%	247	42.2%	
<b>Age</b>					
< 18 years	260	47.1%	129	22.1%	79.18**
>= 18 years	292	52.9%	456	77.9%	
<b>Household</b>					
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%	
<b>Qualification of parents</b>					
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%	
<b>Gambling Frequency</b>					
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%

\*  $p < .05$ . \*\* $p < .01$

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 individuals, and less with their parents, and that their parents 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.



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

<b>Portuguese youth</b>				<b>English youth</b>			
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

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 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, standard deviations and Cronbach's alpha for each predictor is presented in Table 3. Significant differences were found between the two groups in relation to sensation seeking, gambling expectancies, interpretative bias, and availability.

Table 3. Mean, standard deviation, and Cronbach's alpha of each predictor across the two samples

	Portuguese youth	English Youth	Portuguese youth	English Youth
Variable	Mean (SD)	Mean (SD)	A	A
Sensation seeking	2.65 (1.03)	2.99 (0.90)***	0.88	0.93
Gambling expectancies	1.97 (1.22)	2.42 (1.28)***	0.83	0.82
Illusion of control	1.72 (1.07)	1.64 (0.97)	0.74	0.77
Predictive control	2.23 (1.36)	2.26 (1.26)	0.85	0.82
Inability to stop gambling	1.54 (1.02)	1.48 (0.93)	0.86	0.88
Interpretative Bias	2.02 (1.31)	2.28 (1.34)**	0.80	0.85
Angry distress	1.98 (0.88)	1.90 (0.92)	0.68	0.82
Availability	2.29 (0.92)	2.09 (0.89)***	0.74	0.81
Goal-corrected partnership	1.85 (0.79)	1.81 (0.76)	0.76	0.86

Significant different at \*\*p < .01. \*\*\*p < .001

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%, and as it can be seen this difference was statistically significant. The percentage of problem gambling and at-risk gambling were both higher among the English sample.

Table 4: Gambling groups by country (%)

	Portuguese Youth	English Youth	Chi-Square
Problem gamblers	2.6%	4.8%	4.04*
At-risk gamblers	6.4%	8.9%	2.61 <i>ns</i>
Social gamblers	50%	59.9%	11.54**
Non gamblers	41%	26.4%	26***

*ns*=non-significant \*  $p < .05$ . \*\* $p < .01$  \*\*\* $p < .001$

#### *Determining the fit of the proposed model*

Before testing the model on SEM, multicollinearity diagnostics using tolerance and variance inflation factor (VIF) were conducted in both samples, and revealed no multicollinearity among the predictors in the 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 hypothesized model of youth problem gambling in each country. The bootstrapping technique was used to test the indirect effects (see Preacher & Hayes, 2008; Shrout & 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 & Kenny 1986) or the Sobel (Sobel 1982) test (Fairchild & McQuillin 2010; MacKinnon et al., 2002; Preacher & Hayes 2008; Shrout & 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 (Muthen & Muthen, 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 & Muthen, 2002) 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 & Lewis, 1973), The guidelines for evaluating the fit between the target model and the observed data were: (i) RMSEA values of less than .06 reliably indicated good model fit for binary or ordered categorical variables (Yu & Muthen, 2002); and (ii) the criteria of Browne and Cudeck (1993) that a value greater than .90 as indicating good model fit and .80 to .90 as indicating acceptable model fit, as the model to be tested in this study was a complex one, composed by ten latent variables. The criteria of Hu and Bentler (1999) that CFI and TLI values greater than .95 are indicative of a good model fit has been criticized as being too stringent, especially when dealing with more complex models and increasing the probability of rejection (Marsh, Hau & Wen, 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 hypothesized model (see Figure 1), sensation seeking mediates the relationship between the three attachment dimensions and youth problem gambling in both samples.

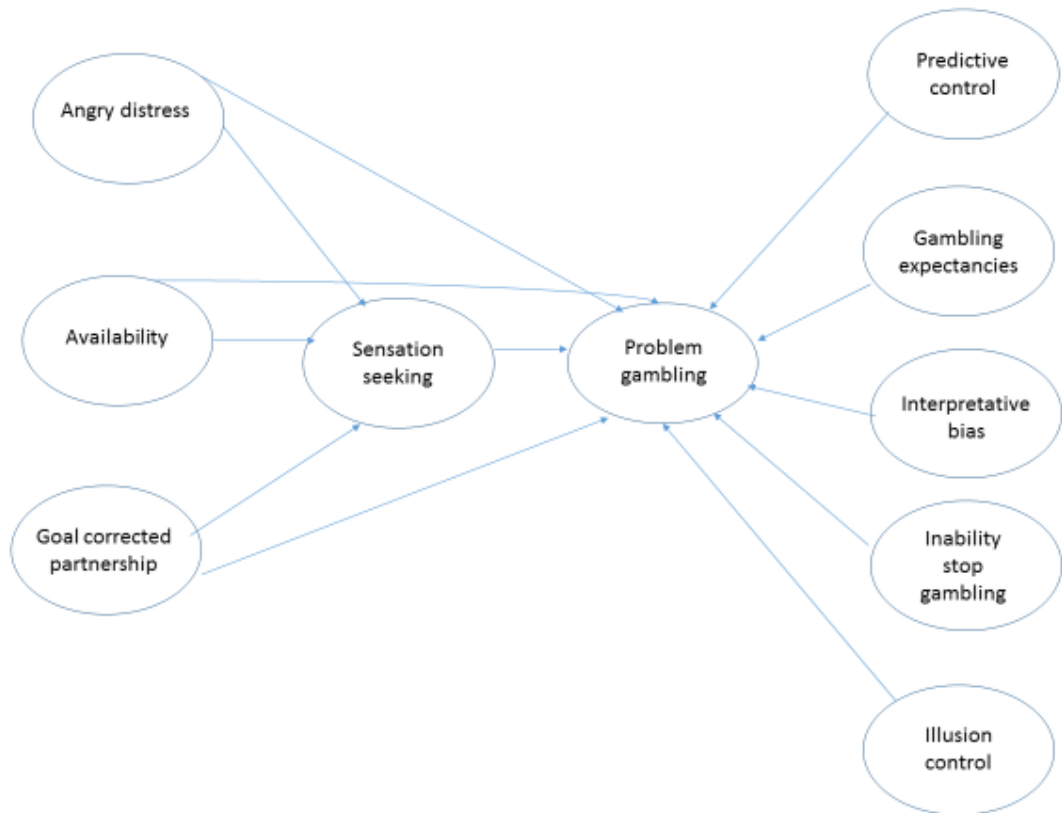


Figure 1: Model tested in both samples

In the Portuguese sample, the hypothesized 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 leads 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, leads to higher levels of sensation seeking (because the items of this attachment dimension were reversed), which in turn increases the probability to engage in 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. Among the Portuguese sample, this model accounted for 81.8% of the variance in problem gambling, and 8.1% in the variance of sensation seeking.

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 leads to higher levels of sensation seeking, which will in turn, increases 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, leads 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. Among the English sample, this model accounted for 67.7% of the variance in problem gambling, and 8% in the variance of sensation seeking.

Table 5. Direct paths to all dependent variables in the study

		<b>B</b>	<b>SE</b>	<b>p</b>
<b>Portuguese youth</b>				
<b>Direct paths to problem gambling</b>				
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 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
<b>Direct paths to sensation seeking</b>				
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
<b>English youth</b>				
<b>Direct paths to problem gambling</b>				
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
<b>Direct paths to sensation seeking</b>					
Angry	→	Sensation seeking	1.34	0.51	p < 0.01
Availability	→	Sensation seeking	-3.10	1.30	p < 0.05
Goal corrected partnership	→	Sensation seeking	2.07	1.00	p < 0.05

## 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 by 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 rate of problem gambling and at-risk gambling were higher among the English sample. This finding may be related to the fact that the English participants were older than the Portuguese, 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 & Griffiths, 2016). In addition, the English gambling landscape is characterized 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, 2008b).

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, Delfabbro, Kaptsis & Zwaans, 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 “normalize” gambling behaviours, and which might change social understandings of the role of gambling among young individuals. 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, characterized 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 to problem gambling via sensation seeking. This finding suggests that attachment to parents or other figures do 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 conceptualized 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, characterized 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 the likelihood of scoring higher on 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 characterized 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 sport. 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 as 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.

## **Conclusion**

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 the statistical significant 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.

Furthermore, as this study revealed that sensation seeking had a significant predictive effect on problem gambling in both samples, it suggested the importance of targeting this variable when designing youth gambling interventions. The next chapter will present a youth

gambling prevention program, in which sensation seeking was incorporated in its content, by including elements that can make the intervention more exciting and appealing to youth who are at risk to engage in gambling, and by helping them to develop self-regulatory skills to delay immediate gratification.

## **Chapter 9 – Study 5: The efficacy of a gambling prevention program among high school students**

### **Introduction**

Although gambling is often conceptualized as an adult activity, research has consistently shown that problem gambling is an emergent public health issue among adolescents and emerging adults (Calado, Alexandre & Griffiths, 2017a), and is part of a broader constellation of other risk behaviours (antisocial, risk-taking, delinquent behaviours) at this developmental stage – particularly for males. Youth problem gambling can bring about severe negative consequences both in the short-term and in the long-term, such as mental health concerns (e.g., mood disorders, anxiety disorders), and behavioural problems (e.g., Kourgiantakis, Stark, Lobo, & Tepperman, 2016).

In addition, a growing body of research suggests that individuals with gambling-related problems start gambling in adolescent years (Carbonneau et al., 2015; Burge et al., 2006). Furthermore, due to limited developed cognitive ability, adolescents are more susceptible to gambling activities (Oh, Ong & Loo, 2017), which can lead to higher rates of problem gambling in comparison with adults. Therefore, the development of preventive initiatives that target this age group assumes particular importance. However, scientific knowledge of preventive initiatives and its empirical evaluation are still scarce, and in the areas of public health, prevention is recognised to be as crucial as treatment in reducing harm (Dickson-Gillespie, Ruge, Rosenthal & Fong, 2008).

In terms of prevention frameworks, the literature has identified three types of prevention initiatives for this particular problem: primary, secondary and tertiary (see Kourgiantakis et al., 2016). The former includes activities targeted to youth populations who not gamble to prevent gambling problems from arising in the first place, with the goal of increasing awareness of the risks involved and consequences associated with problem gambling behaviours. Some data suggests that 80% of youth are included in this group (Messerlian et al., 2005). Secondary prevention is designed to develop initiatives for children at-risk, in order to reduce the likelihood of developing severe problem gambling behaviours. Finally, tertiary prevention target adolescents that already show signs and symptoms of disordered gambling and mainly includes treatment programs (Kourgiantakis et al., 2016). A large body

of evidence in the field of general youth prevention programs for social and behavioural problems have found that primary prevention efforts have the dual benefits of enhancing competencies as well as in reducing internalizing and externalizing problems (Durlak & Wells, 1997; Greenberg et al, 2003). In addition, among preventive gambling initiatives, primary prevention programs provide a low-cost tool to target individuals who may not yet have engaged in the behaviour, but who are in an age group which is particularly susceptible for the development of problem gambling (Williams, Wood & Currie, 2010). In fact, the majority of prevention programs are classified in primary prevention programs, and most of them are considered to be within the category of school-based prevention programs (Huic, Kranzelic, Hundric & Ricijas, 2017). School-based programs are the most frequent prevention initiatives, and constitute a relevant part of an overall prevention strategy as they provide an intervention to an age group who is vulnerable and can prevent an escalation of problem behaviours into adulthood (Williams et al., 2010; Oh et al., 2017).

In order to achieve success utilizing preventive initiatives, risk and protective factors related to gambling are essential components in designing prevention programs. St.-Pierre and Derevensky (2016) classified the school-based gambling-specific prevention programs into two broad categories: (i) psychoeducational prevention programs and (ii) comprehensive psychoeducational and skills training prevention programs. Both types of preventive initiatives aim to increase the accurate knowledge of gambling odds, and to improve maladaptive gambling related cognitions and misconceptions. In fact, it has been found that lack of gambling knowledge can contribute to the development of problem gambling (Blaszczynski & Nower, 2002), and many studies have shown that adolescent problem gamblers have erroneous beliefs about the independence of random gambling events and tend to overestimate their chances of winning (Delfabbro et al., 2006a; Froberg, 2006). Moreover, previous studies have found that problematic gambling behavior can be decreased with cognitive behavioral therapy (CBT) (Fortune & Goodie, 2012). Therefore, some prevention programs attempt to address this lack of knowledge and gambling-related misconceptions.

For instance, Williams and Connolly (2006) examined the influence of increasing statistical and mathematical knowledge through classes focusing on gambling probabilities to reduce gambling participation among university students. A post-6-month evaluation showed that,

after the intervention, students' knowledge in gambling odds and resistance towards gambling fallacies increased. However, this improved knowledge was not associated with observable changes in actual gambling behaviour. Donati, Primi and Chiesi (2014) conducted a school-based prevention program among Italian high school students that targeted gambling-related knowledge and misconceptions, economic perception of gambling, and superstitious thinking. The results showed an improvement in correct knowledge about gambling and reduced misconceptions, perception of gambling's profitability, and superstitious thinking. After the intervention, some behavioural changes were also reported (e.g., decrease in the percentage of gamblers and At-Risk/Problem gamblers).

More recently, Canale et al (2016) in a web-based gambling intervention among high-school students that focused on irrational gambling-related cognitions and misunderstandings related to randomness, found that the program was effective in decreasing gambling problems, but had no effect on gambling frequency and gambling expenditure.

Furthermore, Walther, Hanewinkel and Morgenstern (2013) conducted a prevention program for sixth and seventh grade students, that focused on gambling fallacies, signs of pathological gambling, and gambling features. The results showed that the program increased gambling knowledge and decreased problem gambling attitude. However, the program had no significant influence on lifetime gambling.

Therefore, the effectiveness of school-based prevention programs based on unique determinants of behaviour have been found to show positive results in increasing gambling knowledge and modifying gambling misconceptions. However, the impact on actual gambling behaviour has yet to be established. This suggests that there is a lack of transference of knowledge towards behavioural change in gambling prevention initiatives.

On the other hand, the second group of prevention programs, (i.e., comprehensive psychoeducational and skills training prevention programs), incorporate not only youth problem gambling risk and protective factors, but also more general risk and protective factors associated with adolescent risk behaviour, such as social-emotional and coping skills, problem-solving, decision-making and refusal skills, impulsivity, and sensation seeking. In fact, many studies have found that these variables can also play an influence in the

development of problem gambling among youth (Barnes, Welte, Hoffman & Dintcheff, 1999; Nower et al., 2004; Calado, Alexandre & Griffiths, 2017b).

In the literature, some programs have targeted variables associated with more general risk behaviours. For instance, Todorita and Lupu (2013) utilized an experimental design, in which children aged between 12-13 years were randomly assigned to three groups: a control group; an information group, in which children received information about gambling and gaming, and learned about gambling-related misconceptions; and a rational emotive education (REE) group, in which children learned how to enhance their emotional strength by making them aware of the irrational beliefs causing emotional distress and replacing them with rational and more adaptive beliefs. The results showed that the information group obtained more correct answers in questions related to misconceptions, illusion of control, attitudes, and cognitive errors. The authors concluded that using specific primary prevention tools for changing erroneous conceptions about games was more efficient than only using REE. This suggests the need to incorporate both gambling specific-related variables, and interpersonal and intrapersonal skills in prevention initiatives, and to focus on specific personality characteristics that can facilitate the development of these skills.

Williams et al. (2010) developed a school-based preventive program (the “Stacked Deck”) comprising five lessons that target gambling history, problem gambling, gambling fallacies, decision-making, and problem-solving skills. The findings of this study showed that students aged between 14 and 20 years improved their knowledge about gambling, gained better resistance to erroneous cognitions, but also improved problem-solving abilities and decision-making skills. Furthermore, after the intervention, participants reported significantly more negative attitudes toward gambling and showed a decline in problem gambling frequency. Similarly, Huic et al (2017) developed another school-based gambling prevention program with Croatian adolescents, aged 14-17 years, which focused on cognitive distortions, knowledge of the nature of random events, as well as on other skills (such as problem-solving skills, refusal and self-efficacy). The results of the program showed a significant decrease in risk factors, more specifically a better knowledge about gambling and less gambling-related cognitive distortions. However, effects on problem-solving skills, refusal skills, and self-efficacy were not found. Therefore, these findings suggest that it is still unclear if preventive initiatives can improve skills and other characteristics more associated with general risky



behaviours, and whether targeting these skills has the potential to protect young people from developing gambling-related problems.

The effectiveness of preventive initiatives that have focused on both types have not been well established and only a few studies have used this approach. However, broader and multidimensional approaches might be more important in order to ensure program effectiveness. Some prevention programs have focused on generic skills, such as problem-solving skills, coping strategies, and self-efficacy (e.g., Williams et al., 2010) that have the potential to foster a healthy development among youth and prevent their engagement in problem gambling behaviour. However, to the present authors' knowledge, no gambling prevention program has been developed that has incorporated modules concerning sensation seeking, a generic factor also associated with more general adolescent risky behaviour (e.g., Martins, Storr, Alexandre, & Chilcoat, 2008; Stautz & Cooper, 2013). In fact, it has been found that sensation seeking prevents self-regulation and self-control, and higher sensation seekers tend to undervalue the dangers associated with risky behaviours (Hoyle et al., 2002). In addition, sensation seeking reaches a peak during adolescence, in which higher inclinations to seek excitement and relatively immature capacities for self-control, make adolescents more vulnerable to engage in risky behaviour (Steinberg et al., 2008).

Furthermore, some research has suggested that adolescents when presented with risky behaviours that have both probable rewards and potential costs may be more sensitive than adults in underestimating the costs and overestimating the rewards (Ernst et al., 2005). This highlights the need to target sensation seeking when designing youth interventions, in order to address novelty-seeking and to foster youth self-regulatory competence, through making the intervention more interactive, exciting and appealing – for increasing participant's motivation and enhance their learning – but also through planning activities, in which adolescents are instructed about situations in which sensation seekers tend to respond in a significantly more risky manner and evaluate less the long-term consequences of their behaviour (Donohew et al, 2000).

In fact, interventions focusing on sensation seeking have produced effects in the reduction of other risky behaviours in adolescents. For instance, Conrod et al. (2011) found that an intervention that targeted sensation seeking conducted among secondary students was effective in reducing problem drinking symptoms. Similarly, Zimmerman et al. (2007)

examined the effect of a television campaign aimed at increasing safer sexual behaviour. The campaign utilized a sensation seeking targeting approach, in which creative messages that focused on high-sensation-seeking behaviour were used. The authors found that participants exposed to the campaign reported more increases in condom use, in comparison with the control group. Therefore, these promising results on other risky behaviours stresses the importance of utilizing a sensation seeking targeting approach (Palmgreen & Donohew, 2010) for designing youth gambling prevention initiatives.

Moreover, the literature has emphasized the need to conduct more follow-up studies (National Research Council, 1999; Kourgiantakis et al., 2016), in order to assess long-term (positive) effects and to monitor whether problem gambling develops during youths' developmental life span. Additionally, there are a few studies that have tested the long-term stability of the preventive initiatives (e.g., Capitanucci, Smaniotto & Biganzoli, 2010; Ferland, Ladouceur & Vitaro, 2005).

In addition, the style of delivery assumes particular relevance when designing preventive initiatives for young people. Research has emphasised that youth tend to respond well in programs that are interactive and engaging (Korn et al., 2006; Oh et al., 2017). Other studies highlighted the benefits of using multi-media learning to enhance the learning and retention of knowledge among youths (Ferland, Ladouceur & Vitaro, 2002); Lavoie & Ladouceur, 2004). Moreover, interactive sessions that encourage engagement and discussions are more successful in changing performance among youth (Davis, Thompson-O'Brien, Freemantle et al., 1999). Korn et al. (2006) who developed a program comprising interactive games, in which students learned about time and money management, general risk perception, decision-making, and the concept of randomness, showed that participants enjoyed the program's interactivity, and reported gaining knowledge and awareness about gambling. Furthermore, prevention programs delivered by specialized staff have been found to more effective than the ones conducted by untrained teachers (e.g., Donati et al., 2014; Todirita & Lupu 2013), which highlights the importance of training prevention program providers and developing preventive initiatives with a solid theoretical foundation.

To summarize, school-based programs constitute an important component of an overall problem gambling prevention strategy. However, there is a lack of published research on the design, development and evaluation of original prevention programs, based on a solid

theoretical evidence (St-Pierre and Derevensky, 2016). To date, very few preventive initiatives have been evaluated. In addition, some of the prevention programs that have been evaluated have obtained reliable improvements in gambling knowledge, knowledge about problem gambling, and a decrease in gambling fallacies, but most of these programs have not shown any actual behavioural change. However, improvements in gambling knowledge, misconceptions, and attitudes constitute relevant outcomes in a prevention program, but are of limited importance if they are not accompanied by behavioural change. Moreover, there are few prevention programs that have incorporated both problem gambling risk and protective factors, as well as general risk and protective factors for adolescent risk behaviour. Although some prevention programs have focused on generic variables, to the present authors' knowledge there are no youth gambling prevention programs that have targeted sensation seeking, and that have evaluated this variable. Furthermore, there are few prevention programs that have conducted a follow-up.

Consequently, based on existing empirical evidence, the main goal of the present study was to evaluate a new youth gambling prevention program that was developed in Portugal following the theoretical principles of prevention and based on CBT models for reducing problematic gambling behaviour, and by adopting a sensation seeking targeting approach when designing preventive initiatives for youth risky behaviours. The specificity of this intervention consisted of (i) increasing correct knowledge and reducing gambling-related misconceptions, (ii) decreasing gambling behaviour, (iii) producing a change in factors associated with adolescent risky behaviours in general, such as reducing the levels of sensation seeking, and promoting a more optimal level of experiencing intense, novel and arousing stimuli. The intervention attempted to help students to improve their decision-making skills, when faced with situations that might encourage sensation seekers to respond in a riskier manner and consider only their immediate gratification, which might promote their engagement in more unsafe and dangerous behaviours.

The aim was to evaluate the program's short-term effects, but also the long-term effects by conducting a follow-up after the intervention. Therefore, in line with the aforementioned goal, and with the specific characteristics of this intervention, it will be hypothesised that (i) compared to the control group, the students that will receive the intervention will report at post-test, more correct knowledge about gambling, and a reduction in gambling-related misconceptions, lower rates of problematic gambling, gambling frequency, amount of

money spent, total hours spent on gambling per week, more realistic attitudes towards gambling, and lower levels of sensation seeking, and (ii) these changes will remain stable after a six-week follow-up.

## **Method**

### ***Participants***

The present sample comprised 111 high-school students (65 females, 46 males; mean age=17.64 years; SD=1.62) enrolled in a professional school in Lisbon (Portugal). Written informed consent was requested from students (and their parents in the case that students were minors), and they were assured that the data provided would be handled confidentially. This study was conducted during normal school time.

### ***Measures***

*Demographics and gambling behaviour:* Demographic questions collected information about age and gender. Participants were also asked to indicate how often they had gambled during the past two months (from 1 “Never” to 7 “Everyday”), how many hours they gambled during the week, and the most amount of money they have ever spent on gambling from 1 (“Never bet money on gambling”) and 5 (“Between €100 and €1000”).

*Questionnaire of Misconceptions and Knowledge About Gambling* (Ferland et al., 2002): This instrument consists of two sections – knowledge about gambling, and gambling-related misconceptions. The scales comprise 16 items using a 4 Likert point scale ranging from 1 (totally disagree) to 4 (totally agree). Nine items assess knowledge of gambling (yielding a maximum score of 36) and seven items assess misconceptions of gambling (yielding a maximum score of 28). The following are examples of items targeting knowledge and misconceptions respectively: “Buying lottery tickets is a type of gambling” and “When I’m betting, I must know the tricks and strategies if I want to win”. This scale has already been used in many studies, and previous analysis has always demonstrated a two-factor structure. The first factor corresponds to knowledge about gambling, and the second factor corresponds to misconceptions about gambling (Ferland et al., 2002; Ladouceur, Ferland & Vitaro, 2004). For the present study, the scale was translated and back translated to the Portuguese language. The reliability was considered adequate (knowledge about gambling:  $\alpha=0.70$  at

pre-test;  $\alpha=0.76$  at post-test;  $\alpha=0.71$  at follow-up; gambling related misconceptions:  $\alpha=0.62$  at pre-test;  $\alpha=0.76$  at post-test,  $\alpha=0.75$  at follow-up).

*DSM-IV-Multiple Response-Juvenile* (DSM-IV-J-MR, Fisher 2000). This instrument assesses youth problem gambling. It comprises nine questions, which were developed for adolescents and modelled on the DSM-IV criteria for pathological gambling (e.g., “How often have you found yourself thinking about gambling or planning to gamble”; “After losing money gambling, have you returned another day to try and win back money you lost?”). 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 higher is indicative of problem gambling. The DSM-IVMR-J has good construct validity in terms of its ability to reliably distinguish between social and pathological gamblers (Fisher 2000). This scale was previously validated in Portuguese samples (Calado, Alexandre & Griffiths, 2016) and showed adequate psychometric properties. For the present study, the reliability of this scale was considered satisfactory ( $\alpha=0.77$  at pre-test;  $\alpha=0.66$  at post-test;  $\alpha=0.71$  at follow-up). Due to the relative brevity of the intervention and the relative shortness of time between the pre-test, post-test, and follow-up, when completing the DSM-IV-J-MR, participants were asked to refer to the past two months (and not to the last 12 months, which is the normal timeframe of this scale) to investigate changes in problem gambling behaviour.

*Attitudes Towards Gambling Scale* (ATGS8, Wardle et al., 2011). The ATGS8 is an instrument that was developed for the 2010 British Gambling Prevalence Survey to assess attitudes towards gambling for people aged 16 years and older (e.g., “People should have the right to gamble whenever they want”; “Gambling should be discouraged”). The scale comprises eight items with responses given on a 5-point Likert scale. Higher scores indicate more positive attitudes towards gambling. Previous validations of this scale confirmed its one-dimensional structure, and good concurrent validity (Canale, Vieno, Pastore, Ghisi & Griffiths, 2016). For the present study, the instrument was translated and back translated to the Portuguese language. In the present study, the reliability of this scale was considered satisfactory ( $\alpha=0.76$  at pre-test,  $\alpha=0.76$  at post-test,  $\alpha=0.66$  at follow-up).

*Brief Sensation Seeking Scale* (BSSS, Hoyle et al., 2002): This instrument assesses sensation seeking, and comprises eight items (e.g., “I would like to explore strange places”; “I like wild parties”). The items are responded to on a 5-point Likert-type scale ranging from 1

(strongly disagree) to 5 (strongly agree). Higher scores indicate higher levels of sensation seeking. This instrument has been extensively used with adolescents and emerging adults. Moreover, this scale has already been previously validated with Portuguese samples (Chitas, 2010) demonstrating adequate psychometric properties. For the present study, the Portuguese version validated by Chitas (2010) was administered, and its reliability was considered adequate ( $\alpha=0.84$  at pre-test,  $\alpha=0.77$  at post-test,  $\alpha=0.76$  at follow-up).

### ***Procedure and design***

In order to evaluate the efficacy of the intervention and to evaluate changes in the variables considered in the present study over time as a function of the treatment condition, an experimental design was conducted with two groups (experimental vs. control) and two measurements (pre-test and post-test sessions). For the present study, six classes participated, which were randomly assigned to the experimental and control groups. Random assignment of classrooms to each condition was accomplished by using a random number table.

The experimental group completed the measures described above one week before the intervention (pre-test), at the end of the last session of the program (post-test), and six weeks after the intervention has ended (follow-up). The control group was administered the pre-test and post-test questionnaires (within the same week of the experimental group), but did not receive the intervention. While the experimental group received the intervention, the control group continued with the normal school activity. Pre- and post-intervention as well as follow-up assessments were collected in the classroom via pen and paper.

Informed written consent for participation was obtained from both parents and children. All participants were informed about the nature of the study, and research objectives of the data, with assurances that non-participation would not lead to negative consequences. It was also explained that responses to the questionnaires were anonymous and confidential. Only the respondents' birthday, mother's first name, and the last two digits of their telephone number were required to match pre-test questionnaires to post-test and follow-up surveys. The structure of the program was given ethical approval by the research team's university ethics committee.

### ***The intervention***

The intervention comprised a primary prevention program, and was designed by the first author with constructive input from the remaining authors. The intervention was delivered by the third and fourth authors, who had received intensive training concerning youth gambling and school prevention. The trainers had received regular supervision from the first author. Each trainer stayed in the same class throughout the whole intervention to avoid contamination across conditions and to develop continuity in the relationships between trainers and students. The nature and content of the intervention was derived from the previous literature about youth gambling, more specifically variables that are known to contribute to the initiation of gambling behaviour, and for the development of gambling-related problems among this age group. The specificity of the intervention comprised didactic units to increase correct knowledge and reduce gambling-related misconceptions, but also to target on other factors associated with adolescent risky behaviours in general (e.g., reducing the levels of sensation seeking, and helping adolescents to practice other abilities during the intervention, such as helping students to improve their decision-making skills when faced with situations that might encourage more risky responses).

A variety of methods and techniques to deliver the activities to the students were used, including: (a) icebreaking and warm-up activities to make the students feel comfortable with the facilitator of the program and enhance group cohesiveness; (b) quizzes in order to facilitate previously learned content; (c) interactive methods such as live discussions, and real-life situations in which students could practice newly learned skills; (d) encouragement of critical thinking, especially to promote more insight when deciding to engage in a risky behaviour, and to reduce the levels of sensation seeking; (e) team learning – in pairs, threes, small groups; (f) examples from life-real situations; (g) positive atmosphere building so that students could feel comfortable in discussing topics related to training activities. These techniques were also used to increase students' engagement in the program.

The program comprised five didactic units, each consisting of one session, that were delivered in class during normal school time. The intervention was delivered on a weekly basis and each session lasted approximately one hour. The program started in the first week of December 2016, then had a small break (for Christmas) and restarted again in the first week of January 2017. The first session of the program started with an icebreaking activity in order to create a positive atmosphere in the class and for the students to feel safe. The

other sessions each started with an interactive quiz which summarized and recapped the content delivered in the previous sessions. Detailed explanations of each didactic unit are outlined in Table 1.

Table 1: Detailed description of the prevention program

<b>Session</b>	<b>Didactic unit</b>	<b>Description</b>
Session 1	("Gaming or Gambling"?)	This session began with an icebreaking activity to introduce the program, and make the students feel comfortable with the facilitator. The students were then asked to form teams, and to work in groups. Then, an activity was carried out in order to help students distinguish between gambling and gaming. Each team was presented with images of videogames and gambling activities, and were asked to indicate which of them were gambling. Each team had to compete with each other in order to give the most correct answers. After the presentation of these images, the concept of gambling was introduced, and students were made aware that gambling involves betting money or something of material value on an event with an uncertain outcome, and that humans are unable to control.
Session 2	Cognitive distortions and gambling-related misconceptions	This session began with a quiz to recap the main concepts that were covered in the previous session. Then, one student, who was randomly selected in the class, was asked to play roulette, and to show the group the winning number. The other students in the class were asked to form teams, each one comprising four or five members. Secondly, the same student was asked to play roulette again, and to show the group the winning number again. After the second play, each team (based on the outcome of the first two bets) was asked to make their own bets and write their bets on a sheet. Then, the facilitator gave the sheet to the roulette player, who was asked to read aloud the bet of each team, and to again play roulette to see if the number which each team had bet would come up in any of the plays. This activity was followed by a discussion, in which the concept of independent random events was introduced, and it was explained that it was not possible to predict any gambling outcome based on previous plays.
Session 3	Attitudes towards gambling and money	This session began with a quiz. The quiz in this session was longer, as this was the first session after the Christmas break, and it aimed to recap the content of the two previous sessions. After the quiz, the students were shown a picture of a young male gambler who



		<p>went to Las Vegas. After looking at the picture, students were given a short description about the young man. They were told that he was a Portuguese man who used to gamble in his spare time, and that he said that gambling is a very exciting activity. The students were then asked to work in groups again, and to write down on a sheet their opinions, thoughts, and feelings about people who gamble, and if they thought that individuals who gambled had specific characteristics that individuals who did not gamble did not have. After each team wrote their thoughts and opinions, the facilitator collected the sheets, and read loud what each team had written. This activity was followed by a brief discussion, in which the thoughts that students had about gambling. It was noted that there were some stereotypes and labels regarding gamblers, such as being categorized as cool, or having certain traits, but there were gamblers across all ages, and from many social and cultural backgrounds, and it could be a bias to have a stereotype towards people who gamble. After this activity, the students were shown another picture of the same young man, and they were told that he had won 500 euros in one evening in the casino. Then, the students were asked the following questions “Do you think that it is nice to win 500 euros in one evening? Do you think that people who win too much money in a very short period are happier? Do you think that there are other things in life that can make people happy?” After these questions, the students were given a second sheet, in which they were instructed to write about how the day of a happy person. This activity was followed by a final discussion, in which it was concluded that there are important things in life besides money, and that sometimes people who gamble want to win money in a very easy way, but most of the time this will not happen (because it is not possible to predict the gambling outcomes). At the end of the session, students were given a questionnaire about attitudes towards gambling to reflect on their own personal attitudes, and they were told that they were free to share their responses with the rest of the class, if they felt comfortable in doing so.</p>
Session 4	Sensation seeking	<p>This session began with a quiz to recap the concepts that were covered in the previous session. After the quiz, the students formed teams, comprising three or four members, and each team had to rank activities that were presented on a PowerPoint slide in terms of the level of sensation seeking that each activity provokes, on a scale from 1 (the activity does not provoke any</p>

		<p>sensation seeking) to 5 (the activity provokes a high level of sensation seeking and excitement). The activities shown were bungee jumping, taking a trip with no pre-planned routes or timetables, climbing Mount Everest, driving under the influence of alcohol, sleeping in, walking in a dark street where there are no people, going out with people that they have just met, talking on a mobile phone, skipping school, smoking cigarettes, buying a lottery ticket, gambling on bingo, and gambling at an online casino. While each team was ranking each activity, the facilitator wrote the ranks of each team on a sheet, and in the end of this activity, the students were told which activities had the highest score. Then, the students were asked to fill in a sheet for the activities that had the highest score for excitement, adrenaline, and sensation seeking, as well as the three gambling activities. On this sheet, the students had to write down the stimuli, thoughts, feelings, short-term consequences, long-term consequences, and final decision for engaging in this activity. This activity was followed by a dynamic discussion, in which it was explained that there are some activities that cause some high levels of adrenaline, and excitement, but that these feelings were short-lived. In addition, it was discussed that in life when we take a decision if we engage in a specific activity, we need to think about both long-term and short-term consequences. Finally, the facilitator gave the students another sheet, which outlined the steps that people need to take in order to make mature and mindful decisions about engaging in an activity or behaviour.</p>
Session 5	Problem gambling	<p>This session began with a quiz in order to briefly recap the concepts that were covered in the previous session. The students were then shown a video of the actor Ben Affleck (known for his gambling addiction) in front of a poker table, and facing another gambling loss. After the video, the students were presented with a newspaper headline which informed them that the gambling behaviours of this actor had affected his marriage with the actress Jennifer Garner. This article added that the couple travelled to Las Vegas, and that Ben bet thousands of dollars, and although Jennifer was very upset with his behaviours, he claims that he could not stop his behaviour. According to this source, Ben mentioned that he felt bad or fed up when trying to cut down his gambling behaviour, and that the actor had been accused of fraud because he had tried card-counting to win playing blackjack. After the video and the newspaper headline, the students were told that the</p>

		<p>actor was known for his gambling addiction, and then they were asked what aspects mentioned in the video and in the newspaper article that indicated the actor had developed a gambling addiction. This activity was followed by a discussion, in which students were shown in a PowerPoint slide the criteria of problem gambling according to DSM. During this activity, it was explained that for someone being considered a problem gambler, they must show at least four of the criteria. After this, the students were asked to work again in groups, and each group was given a document that showed cases of adolescents with problem gambling behaviour. These cases were taken and adapted from Griffiths (1995). The students were asked to identify the signs and criteria of problem gambling that were present in each of the cases. At the end of this session, the students were given tips about responsible gambling, and were provided contacts concerning relevant institutions that provided support for problem gambling in Portugal.</p>
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#### *Data analysis and analytic strategy*

In the first step, all variables were examined for skewness and kurtosis at pre-test, post-test, and follow-up assessments. The variable “amount of hours gambled in the week” was found to be skewed in pre-test, post-test, and follow-up, and a logarithmic transformation was used to normalize the distributions (Tabachnick & Fidell, 2007). In a second step, the baseline equivalence between the experimental and control groups was tested with independent sample t-tests for continuous variables and with chi-square tests for categorical variables. Then, the short-term efficacy of the intervention was analysed by conducting a mixed 2 x 2 ANOVA with *time* (pre-test and post-test) as within-factor and *group* (experimental and control) as between-factor for each dependent variable. As a fourth step, the short-term effects on the basis of problem gambling severity were assessed. Inside the experimental group, a mixed 2 x 2 ANOVA was conducted with *time* (pre-test and post-test) as within-factor and *problem gambling severity* (non-problem and at-risk/problem) as between-factor for each dependent variable for which significant interaction effects were found in the previous analysis step. Subsequently, the long-term efficacy was analysed by considering results from the experimental group. More specifically, paired sample t-tests were used to compare post-test and follow-up scores for the dependent variables for which the intervention was found to be effective at post-test. Finally, using McNemar tests, we compared the percentage distribution of At-Risk/Problem gamblers respectively found from

post-test to follow-up in the experimental group. In line with previous gambling prevention initiatives (e.g., Donati et al, 2014), in the present study, problem gambling severity was categorized as the combination of at-risk and problem gambling, and therefore individuals who obtained a score of 2 or higher in the DSM-IV-J-MR instrument were considered to belong to the problem gambling group and were compared against non-problem gamblers (those who obtained a score of 0 or 1).

## Results

### *Baseline equivalence evaluation*

As a first step, the equivalence was tested between the experimental and the control group for socio-demographic data, for the variables considered in the intervention, and for problem gambling behaviour. These analyses were conducted with the students of the experimental group who took part in the pre-test, attended the full intervention, and completed the post-test (n=56), and with the participants from the control group who completed the pre-test and post-test measures (n=55). No significant differences were found between the two groups with regard to socio-demographic variables, gambling frequency, amount of money spent gambling, total hours spent gambling per week, attitudes towards gambling, correct knowledge and misconceptions about gambling, sensation seeking, and problem gambling behaviour as assessed at the pre-test session (see Table 2).

Table 2. Baseline equivalence evaluation between the experimental group (n=56) and the control group (n=55)

	Experimental group		Control group		T	p value
	Mean	SD	Mean	SD		
Age	17.55	1.60	17.73	1.66	-0.56	n.s. <sup>a</sup>
Gambling frequency	2.57	1.82	2.11	1.52	1.45	n.s.
Amount of money spent	2.34	1.25	1.95	1.16	1.72	n.s.
Total hours	0.16	0.27	0.12	0.22	1.03	n.s.
Attitudes	24.02	3.64	23.76	4.47	0.33	n.s.
Knowledge	21.38	2.95	21.89	3.41	-0.85	n.s.
Misconceptions	17.16	2.31	16.25	3.03	1.77	n.s.
Sensation seeking	3.47	0.79	3.45	0.85	0.12	n.s.

	N (M)	N(F)	N (M)	N (F)	Chi-square	<i>p</i> value
Gender	24	32	22	33	0.09	n.s.
	N(NPGs)	N(ARPGs)	N(NPGs)	N(ARPGs) <sup>b</sup>		
Problem gambling behaviour	44	12	50	5	3.25	n.s.

<sup>a</sup> Non-significant (n.s.)

<sup>b</sup> Non-problem gamblers (NPGs) versus at-risk/problem gamblers (ARPGs). Non-problem gamblers (NPGs) were categorized as having a score of 0 or 1 and at-risk/problem gamblers (ARPGs) as having a score of 2 or higher in the DSM-IV-J-MR instrument.

### *Short-term efficacy evaluation*

Short-term intervention effects were tested performing a mixed 2 x 2 ANOVA with *time* (pre- and post-test) as within-factor and *group* (experimental vs. control group) as between-factor. The analyses were performed on each of the following dependent variables: gambling frequency, amount of money spent, total hours spent gambling per week, correct knowledge about gambling, misconceptions about gambling, attitudes towards gambling, and sensation seeking. The main effect of interest was the *group x time* interaction.

Significant interactions were found for total hours spent gambling per week [ $F(1,109) = 4.8$ ,  $p < .05$ ,  $\eta^2 = 0.04$ ], knowledge [ $F(1,109) = 48.91$ ,  $p < .001$ ,  $\eta^2 = .31$ ], gambling-related misconceptions [ $F(1,109) = 59.55$ ,  $p < .001$ ,  $\eta^2 = .35$ ], and attitudes [ $F(1,109) = 14.91$ ,  $p < .001$ ,  $\eta^2 = .12$ ]. Interactions were non-significant for gambling frequency [ $F(1,109) = 3.37$ ,  $p = .07$ ], amount of money spent gambling [ $F(1,109) = 0.69$ ,  $p = .41$ ], and sensation seeking [ $F(1,109) = 2.89$ ,  $p = .09$ ].

Post-hoc *t*-tests were conducted for those variables for which significant interactions were found. The post-hoc *t*-tests showed the interaction effects to be due to significant changes from pre-test to post-test in the experimental group but not in the control group. More specifically, in the experimental group there was a significant improvement in correct knowledge about gambling and a significant reduction of gambling-related misconceptions, attitudes towards gambling, and total hours spent on gambling per week (see Table 3).

Table 3. Mean scores compared with paired-samples *t*-test (and related effect sizes) for the experimental group (n=56) and the control group (n=55) at pre- and post-test for the variables with significant interaction

	Pre-test		Post-test		<i>t</i>	d
	M	SD	M	SD		
<i>Knowledge about gambling</i>						
Experimental group	21.38	2.95	26.21	3.52	-8.82***	1.18
Control group	22.07	3.41	22.56	3.67	-1.72 (n.s.)	–
<i>Misconceptions</i>						
Experimental group	17.16	2.31	12.45	2.86	9.56***	1.28
Control group	16.25	3.03	15.93	3.01	1.18 (n.s.)	–
<i>Attitudes</i>						
Experimental group	24.02	3.65	21.21	4.08	4.11***	0.55
Control group	23.76	4.47	23.93	4.17	-0.48 (n.s.)	–
<i>Total Hours</i>						
Experimental group	0.16	0.27	0.08	0.17	2.43*	0.32
Control group	0.12	0.22	0.12	0.19	0.09(n.s.)	–

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

n.s. non-significant

#### *Short-term efficacy evaluation based on problem gambling severity*

In order to verify if the aforementioned short-term effects were obtained by all students in the experimental group regardless of their problem gambling severity status, students without gambling problems (classed as non-problem gamblers), and students with gambling problems (classed as at-risk/problem gamblers) were separately analysed inside the experimental group. Therefore, a mixed ANOVA with *time* (pre-test and post-test) as within-factor and *problem gambling severity* (non-problem and at-risk/problem) as between-factor was performed on each dependent variable for which the interactions were found to be significant (more specifically, knowledge about gambling, misconceptions, attitudes, and total hours). No significant interactions were found for attitudes [ $F(1,54)=.23$ ,  $p=.63$ ]; correct knowledge about gambling [ $F(1,54)=.39$ ,  $p=.54$ ], and misconceptions [ $F(1,54)=.02$ ,

$p=.90$ ]. However, a significant interaction was found for total hours spent gambling per week [ $F(1,54)=24.71, p<.001, \eta^2=.31$ ]. This suggests that for this specific variable, a different pattern of change between pre-test and post-test occurred in the two types of gamblers. However, the main effect of time was significant for knowledge [ $F(1,54)=38.49, p<.001, \eta^2=.42$ ], misconceptions [ $F(1,54)=61.53, p<.001, \eta^2=.53$ ], attitudes [ $F(1,54)=9.43, p<.05, \eta^2=.15$ ], and total hours spent gambling per week [ $F(1,54)=27.31, p<.001, \eta^2=.34$ ], which suggests that a significant change had occurred from pre-test to post-test in all these variables.

Post-hoc  $t$ -tests showed that significantly higher levels of correct knowledge about gambling occurred from pre-test to post-test in both types of gamblers. In addition, gambling-related misconceptions significantly improved from pre-test and to post-test in both types of gamblers. However, a significant decrease in attitudes towards gambling from pre- to post-test only occurred among non-problem gamblers, suggesting that the intervention was unsatisfactory in reducing attitudes towards gambling among the problem gambling group (see Table 4).

Table 4. Mean scores compared with paired-samples  $t$ -test (and related effect sizes) for non-problem gamblers ( $n=44$ ) and at-risk/problem gamblers ( $n=12$ ) in the experimental group

	Pre-test		Post-test		$t$	$d$
	M	SD	M	SD		
<i>Total Hours</i>						
Non-problem gamblers	0.06	0.14	0.05	0.13	0.34 (n.s.)	–
At-risk/problem gamblers	0.54	0.28	0.19	0.23	3.74*	1.08
<i>Knowledge about gambling</i>						
Non-problem gamblers	22.34	3.01	26.23	3.03	-6.64***	1
At-risk/problem gamblers	21.42	3.12	26.17	5.10	-2.97*	0.86
<i>Misconceptions</i>						
Non-problem gamblers	17	2.44	12.32	2.67	8.74***	1.32

At-risk/problem gamblers	17.75	1.71	12.92	3.55	3.87**	1.12
<hr/>						
Attitudes						
Non-problem gamblers	23.77	3.78	20.80	4.28	3.69**	0.56
At-risk/problem gamblers	24.92	3.06	22.75	2.86	1.79 (n.s.)	–

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ;  
n.s. non-significant

### *Long-term efficacy evaluation*

In order to evaluate the long-term efficacy of the intervention, paired sample t-tests were conducted for the post-test and follow-up-test scores of the variables for which the intervention was found to be effective in the short-term (knowledge about gambling, misconceptions, attitudes, and total hours spent gambling per week). A total of 39 participants completed the post-test and the follow-up sessions. The results of the *t*-test showed no significant differences between the post-test and follow-up scores, suggesting the permanence of the intervention effects over some time for correct knowledge about gambling, misconceptions about gambling, attitudes towards gambling, and total hours spent gambling per week (see Table 5).

### *Problem gambling behaviour*

To verify that the intervention had the desired effect on adolescent self-reported problematic gambling, changes in the percentage of at-risk/problem gamblers inside the experimental group from pre-test to follow-up were evaluated using a McNemar's test. The percentage of at-risk/problem gamblers decreased from 21.4% in pre-test to 8.9% in post-test. The exact McNemar's test determined that this difference was statistically significant ( $p < .05$ ). Then, it was calculated if the percentage of at-risk/problem gamblers from post-test to follow-up changed. The total number of participants that took part in both the post-test and follow-up was 39 participants. The percentage of at-risk/problem gamblers from post-test to follow-up did not change, because the percentage of at-risk/problem gamblers was 7.7% in both time periods.

Table 5. Mean scores compared with paired-samples t-test for the training group (n=39) at post-test and follow-up.



	Post-test		Follow-up		<i>t</i>
	M	SD	M	SD	
<i>Knowledge about gambling</i>	26.49	3.10	25.59	3.22	1.64 (n.s.)
<i>Misconceptions</i>	12.46	2.71	12.74	2.93	-0.68 (n.s.)
<i>Attitudes</i>	21.08	3.59	20.87	3.69	0.64 (n.s.)
<i>Total hours</i>	0.07	0.17	0.09	0.17	-0.92 (n.s.)

n.s. non-significant

## Discussion

To the authors' knowledge, the present study is the first gambling prevention program conducted in Portugal. At the same time, the intervention attempted to overcome some of the limitations of previous international programs, such as the lack of follow-up, and the lack of assessment of behavioural change. In addition, the program attempted to incorporate both unique and common determinant approaches into the prevention program due to the benefits of both approaches, and to fill a gap in the gambling prevention literature, because very few studies have included both components (i.e., gambling knowledge and general factors in the program design, and evaluation).

Overall, the findings demonstrated that the intervention produced the desired effect on knowledge about gambling, gambling-related misconceptions, attitudes towards gambling, and total hours spent gambling per week. More specifically, students who had received the intervention enhanced their knowledge about gambling, and reduced their gambling-related misconceptions, attitudes towards gambling, and the total hours spent gambling per week, whereas the students from the control group did not show a significant change on these variables from pre-test to post-test. The results obtained in the experimental group were in line with previous preventive initiatives found in the literature (e.g., Donati et al., 2014; Taylor & Hillyard 2009; Ferland et al., 2002). Nevertheless, the intervention did not show any effect on gambling frequency, amount of money spent gambling, which confirm other prevention programs (Williams et al., 2010; Huic et al., 2017).

The results obtained for the amount of money spent and gambling frequency may be explained by the fact that very few students reported that they spent the highest amounts of money on gambling in the survey (between €100 and €1000); and only relatively few students reported gambling at the highest frequencies. In addition, the results obtained for sensation seeking may be related to the fact that effects on personality characteristics and intrapersonal skills were unlikely to occur during the time of the evaluation of this program (post-test and follow-up). In fact, research suggests that sensation seeking is unlikely to be reduced via interventions (Zuckerman, 2007), but this does not imply that sensation seeking should not be incorporated into interventions aimed at reducing risky behaviour during adolescence. In fact, it is possible to change how sensation seeking is expressed, minimizing unhealthy expressions (Arnett, 1995). Studies have demonstrated that personality-targeted interventions, especially sensation seeking, produce long-term effects in the reduction of other risky behaviours in adolescents, including alcohol use (Conrod et al., 2011), marijuana use (Palmgreen et al., 2001), and promoting safer sexual practices (Zimmerman et al., 2007). In fact, a growing body of research has documented that interventions designed to address the needs for novelty and sensation seeking considerably enhance the ability to capture the attention of individuals likely to engage in health-risky behaviours, as well as their motivation to change their behaviour (Donohew et al., 2000; Lorch et al., 1994).

The short-term changes on correct knowledge concerning gambling, and gambling-related misconceptions were found in both problem- and non-problem gambling adolescents. However, the intervention only reduced the total hours spent on gambling per week among the problem gambling group. This finding may be explained by the fact that the problem gambling group reported gambling more hours per week in comparison with the non-problem gambling group. Moreover, the intervention only reduced the attitudes towards gambling among the non-problem gambling group. This result may be explained by the self-perception theory (Bem, 1967), which postulates that individuals typically conjecture about the attitudes they have based on their own behaviour, without any previous disagreeable feelings. Therefore, problem gamblers would likely show more resistance to change their attitudes because they are in consonance with their behaviour. On the other hand, the Integrated Behavior Model (Montaño & Kasprzyk, 2008) postulates that attitudes and subjective norms regarding a behaviour are based on social acceptance of family members, friends or significant others. Moreover, some research has found that the development of

more positive attitudes towards gambling is associated with gambling approval by close others, which in turn is associated with more gambling involvement (e.g., Hanss, Mentzoni, Delfabbro, Myrseth & Pallesen, 2014; Orford, Griffiths, Wardle, Sproston & Erens, 2009). Therefore, future interventions should explore the relationships that adolescents have with significant others who gamble (e.g., friends and family), the outcomes of their gambling behaviour, beliefs about whether significant others think that adolescents will engage in this behaviour, and focus on peer resistance/refusal skills.

Regarding long-term-efficacy, the results showed that post-test mean scores of the variables for which the intervention was found to be effective in the short-term, did not differ significantly from the follow-up ones, indicating stability of the effects over a period of six weeks for participants who have attended the training program. This represents an important finding, because it indicates that the content of this program was suitable for the target population and delivered in a manner that allowed for some retention of the material.

Furthermore, in relation to the effects on problem gambling behaviour, the findings showed that among students from the experimental group, there was a significant reduction in the percentage of at-risk/problem gamblers from pre-test to follow-up. This finding appears to satisfy one of the main goals of a preventive program, that is, to prevent vulnerable individuals, such as adolescent gamblers, from the development of severe gambling problems (Dickson-Gillispie et al. 2008). In fact, this result is of particular relevance, because among previous prevention programs that have conducted a behavioural efficacy evaluation, only Williams et al. (2010), Donati et al. (2014) and Canale et al (2016) have reported positive results. In the present study, the effect on behavioural efficacy only occurred in relation to problem gambling behaviour and not in gambling frequency (although this was very close to achieving statistical significance), which confirms findings from previous gambling prevention programs (e.g., Canale et al, 2016). One possible explanation for this is that students with the most symptoms of problem gambling may profit more from prevention initiatives (William et al, 2010).

Despite these encouraging findings, the present intervention study is not without its limitations. Firstly, the follow-up was conducted only six weeks after the end of the intervention, which prevented a longer-term evaluation of the results. However, due to school constraints, and the impending exams period, it was not possible to conduct a longer

follow-up after the end of the intervention. Therefore, future intervention studies should attempt to conduct longer follow-up periods in order to draw more solid conclusions concerning the effects obtained in the intervention. In addition, both the experimental and the control group had modest sample sizes, and not all students were present during the follow-up, which made the sample size even smaller. However, power analysis revealed that this sample size was adequate to obtain effect sizes, and the sample size obtained was similar to other previously published prevention programs (e.g., Todirita & Lupu, 2013). Furthermore, the information obtained concerning the behaviour of the adolescents was based on self-reports, which might have led to some measurement errors and/or biases. Therefore, further research with larger sample sizes and more objective measures of gambling and gambling-related variables, such as the Iowa Gambling Task, and the Gambler Fallacy Task (Primi & Chiesi, 2011) could be utilised.

The findings of this study have potential important implications. Firstly, the present study provides support for the integration of interventions aimed at promoting more responsible gambling within high-school curricula. Adolescence is characterized by an increase in risky behaviours, and by a limited developed cognitive ability, which makes this age group more vulnerable to gambling hazards (Oh et al., 2017). In fact, this program was effective in improving correct knowledge about gambling and in improving gambling-related misconceptions, and early evidence suggests that correcting irrational gambling-related cognitions can lead to behavioural change (Delfabbro, 2004). Consequently, brief school-based prevention programs, easy to disseminate for large group of students that teach students about independence of random events in gambling games, and illusion of control features, may be recommended.

## **Conclusion**

In conclusion, the results of this study provide an important contribution to the emergent body of literature concerning youth gambling prevention programs, by presenting an original program designed and evaluated in Portugal. Overall the results attested the short and long-term effectiveness of an integrated intervention in increasing correct knowledge of gambling, and in reducing gambling related misconceptions both among non-problem and at-risk/problem gamblers, and also demonstrated some changes in problem gambling behaviour. School-based gambling prevention initiatives are still limited in the literature,

and the present study reinforces the need for developing more interventions and provides important suggestions for future programs to improve its content and subsequent effects.

This intervention consisted in the last empirical study of this thesis. The next chapter, will summarize the main findings, reflect about some limitations of the studies presented, and discuss possible implications of the findings obtained.

## Chapter 10 - General discussion

Youth problem gambling represents a serious public health issue and concern. The current generation of youth have spent their entire lives in an environment where gambling is widespread, socially acceptable, and easily accessible in spite of age prohibitions. In addition, with the emergence of Internet gambling, gambling activities had become even more available to this age group. Although the incidence of severe gambling problems amongst young individuals remains relatively small, there are significant consequences to the individual, their families, and society. Therefore, there is an urgent need to conduct more research on youth problem gambling in order to control for the social costs associated with it.

The present thesis aimed to further understand this phenomenon especially in the Portuguese context, by exploring the perceptions of Portuguese youth about gambling, perform a validation of a widely used gambling instrument, the DSM-IV-MR-J to the Portuguese language, examine the relationship between gambling behaviour and other variables less explored in the gambling literature, such as attachment, and design a school intervention based on the findings of the previous studies aimed to enhance the correct knowledge about gambling, correct gambling-related misconceptions, and reduce gambling behaviour. The unique contribution to knowledge of this thesis was to provide an instrument to assess youth problem gambling in the Portuguese psychological community, to examine how family and individual variables interacted with each other for the prediction of youth problem gambling in two samples from two different cultural contexts, Portugal and England, incorporate in the intervention new techniques and elements, adapt them to the Portuguese context, and evaluate its efficacy by assessing short-term, and more long-term effects.

The first empirical study of this thesis (Chapter 5) comprised a qualitative exploratory study, and examined the general perceptions, thoughts, motivations, and the role of gambling among a sample of Portuguese adolescents and young adults. For this study, 46 Portuguese adolescents and young adults aged between 13 and 26 years were recruited, and eight focus group were conducted. A single focus group guide was developed, and the data was analysed using thematic analysis. The findings of this study showed that the gambling games reported

both by adolescents and young adults were online poker and football bets. In addition, a noteworthy finding of this study was that both adolescents and young adults stated that the Massively Multiplayer Online Role Playing Games (MMORPGs) could be played as a gambling activity. During the analysis of these focus group discussions, an important theme that emerged was general perceptions towards gambling. For both adolescents and young adults, gambling was perceived as an acceptable and funny activity. However, adolescents also associated gambling with money, whereas young adults also perceived gambling as a risky activity, and showed to have a better understanding of what gambling is about, as they expressed that it is not plausible to win money in the long run, and that gambling has the risk to make individuals addicted. Concerning the motivations for gambling, young adults mentioned financial rewards, whereas for adolescents in addition to financial motivations, social rewards, such as social prestige also emerged. Another theme that emerged in the analysis was the outcomes of gambling. For adolescents, gambling had positive outcomes, such as more entertainment and a better life due to the money won. For adolescents, gambling was viewed as a lucrative activity. On the other hand, young adults emphasised that gambling was mainly an illusion, and stated that people who start gambling should not expect that this will bring good consequences for them.

Furthermore, adolescents perceived gambling and gaming as two similar activities, as both of them trigger positive feelings, and allow individuals to win money. For young adults, although they reported some common elements between these two activities, such as specific characteristics of the games, and also mentioned that both activities trigger positive feelings, they also stated that gaming and gambling were distinct, as gambling was mainly luck and a more lonely activity, and gaming allowed the possibility of self-improvement. During the focus group discussions, participants mentioned that underage youth had access to gambling. Therefore, the findings of this first study demonstrated that adolescents were relatively naive about gambling in the sense they believed that winning was easy, and were not so aware about the potential hazards of gambling. Moreover, the results of this study also suggested that some online games can be played as a gambling activity.

The second empirical study (Chapter 6) assessed the psychometric properties of the DSM-IV-MR-J and validated it for use in the Portuguese language, among a sample of 753 Portuguese high school and first-year college students. This data was collected from different regions of the country, and from different groups of youth. More specifically, the data were

from adolescents and emerging adults attending regular high-schools and colleges, who may or may not have gambling experience; from adolescents attending vocational schools where gambling experience was considered to be more likely; and from adolescents living in one youth detention centre, where the gambling experience was considered to be highly likely. This oversample procedure was also used in other validations of previous gambling instruments (e.g., Hayes, 2014) and was utilised to gain a higher variance of gambling experience in the sample in order to better examine the psychometric properties of the scale. The findings replicated the one-factor structure of this scale found in previous studies (e.g., Fisher, 2000; Castrén et al., 2015), and showed evidence of criterion validity, as well an adequate reliability. Based on these findings, the Portuguese DSMIV-MR-J appears to be a valid and reliable instrument, and provides a much needed psychometric tool for the development of more research on youth gambling in Portugal.

Chapters 7 and 8 developed theoretical models comprising individual and family variables, in order to further the understanding of youth problematic gambling, and extend the existing literature on this field. The empirical study in Chapter 7 examined the associations between attachment (a variable less explored in the gambling literature) and problem gambling, and tested an integrative and innovative model associating problem gambling with parental attachment, and evaluating the mediating effects of coping strategies. For this study, a total of 988 English adolescents and emerging adults were recruited to participate. The results indicated that individuals that scored high on the attachment dimension of angry distress were more likely to present high levels of emotion-focused coping, which in turn was positively associated with problem gambling. These findings suggest that some family variables can have a more indirect relationship with youth gambling behaviour, and provided some insights on how some factors might influence or interact each other for predicting youth gambling behaviour.

The empirical study in Chapter 8, comprised a cross-cultural study in which a model was tested in two samples from two different countries (Portugal and England). This model examined the potential mediating role of sensation seeking in the relationship between attachment and problem gambling. For this study, a total of 1,137 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. The findings demonstrated that English youth showed a higher prevalence of



problem gambling. This result may be explained by the fact that in England, the legal age for some gambling activities (e.g., scratchcards and lotteries) is 16 years, whereas in Portugal the legal age to engage in any gambling activity is 18 years. However, in spite of these differences, in both samples, sensation seeking showed a positive relationship with problem gambling, and mediated the relationship between attachment and problem gambling. This finding assumes particular relevance, because it confirms that attachment has a more indirect association with youth problem gambling, and again advances the knowledge about how the quality of attachment to parents or other parental figures can be an influential variable on adolescent gambling participation.

The final empirical study in Chapter 9, comprised a primary prevention program that was designed based on the findings obtained in some of the previous studies of this thesis. In fact, because Study 1 (in Chapter 5) showed, adolescents viewed gambling and gaming as two similar activities, and Study 4 (in Chapter 8) demonstrated that sensation seeking showed a positive and significant association with the development of youth problem gambling, the intervention that was developed attempted to help students distinguish between gambling and gaming, and to address the needs of novelty, excitement, and sensation seeking. In this intervention, a variety of methods was used to increase the students' motivation and the retention of material, such as icebreaking activities, quizzes, and team learning.

For this study, a pre- and post-test design was performed with 111 Portuguese high-school students randomly assigned to two groups (experimental and control). The study evaluated the efficacy of this integrative intervention to prevent youth problem gambling based on a multidimensional set of factors including gambling-related knowledge, misconceptions, attitudes, gambling frequency, amount of money spent, total hours spent gambling per week, and sensation seeking. The findings demonstrated that the intervention was effective in improving the correct knowledge about gambling, reducing gambling-related misconceptions, decreasing positive attitudes towards gambling, and in reducing the total hours spent on gambling per week. The intervention was not effective in reducing the gambling frequency during the past two months, the amount of money spent on gambling, and the levels of sensation seeking. Subsequent analysis revealed that the intervention improved the correct knowledge about gambling and reduced the gambling misconceptions among the two groups of gamblers, non-problematic gamblers and at-risk/problem gamblers.

However, the intervention only produced a change among the non-problematic group of gamblers on the variables of attitudes, and the total hours spent on gambling per week only changed among the at-risk/problem gamblers group. In addition, the findings showed that the intervention was also effective in reducing the number of at-risk/problem gamblers during the study period. Furthermore, final analysis demonstrated that the changes in these variables for which the intervention was found to be effective in the short-term (knowledge about gambling, misconceptions, attitudes, total hours spent gambling per week, and number of problematic gamblers) were also stable after a six-week follow-up. In conclusion, this study attempted to provide important contributions to the field of youth gambling prevention, which is still in its infancy, and highlights the need for conducting more preventive initiatives.

### ***Methodology***

In this research, mixed methods were used. In fact, in the first empirical study of this thesis, focus groups were used to collect data. According to some authors, focus group discussions constitute a relatively quick and inexpensive way of collecting data (Beyea & Nicholl, 2000). In addition, focus groups provide a useful tool to explore data, and generates in-depth discussions from its participants. The main advantages of focus group are the fact that this type of methodology is particularly suited for situations where the researcher wants to obtain insights about motivations and into sources of complex behaviours. This technique also provides detailed information about a phenomenon in a relatively short amount of time and at a low cost (Bertrand, Brown & Ward, 1992).

In addition, one of the main strengths of this technique lies in the interaction between participants that emerges during the discussion. In fact, it has been widely recognized that the group synergy can promote more openness between its members and facilitate the production of a wide range of positions and inspire participants to remember forgotten ideas or unthinking concepts (Kitzinger & Barbour, 2001). The main disadvantages of using focus group is that the presence of other individuals may constrain participants, preventing them giving an opinion, influencing the way a judgment is articulated, and pushing participants to provide more socially desirable responses. Moreover, the speed of interactions can sometimes prevent participants going through every topic in detail, especially if there are too many issues to discuss. In fact, the interaction that arises during a focus group discussion

often emerges from the association of ideas, which can provoke a constant change of topics (Acocella, 2012).

Furthermore, the process of analysing the data can be enormously demanding and time consuming, which abandons the idea that focus group constitute a relatively quick tool to analyse a phenomenon. However, it enables to generate much more in-depth data, that would not be possible to be generated by means of quantitative methods, such as questionnaires or surveys (Mansell, Bennett, Northway, Mead & Moseley, 2004). Therefore, it can be concluded that focus group is apparently a simple methodology, but it can be very challenging and requires a long process of preparation. However, although focus group can be a very time consuming method for analysis, the interaction that emerges during the discussion provides a unique opportunity for participants explore their ideas, and the richness of the data collected makes this technique a very rewarding experience.

In this study, thematic analysis was used to analyse the data. Thematic analysis is a widely used qualitative method in the psychology field. Thematic analysis “is a method for identifying, analysing and reporting patterns (themes) within data” (Braun & Clarke, 2006, p.79). Overall, it provides a very flexible tool for qualitative analysis, and it can be used with different research questions and with different types of data. Moreover, this method of analysis offers a structured method for identifying key themes within a dataset (Boyatzis, 1998). In addition to these advantages, thematic analysis can also generate unexpected insights, and its results are relatively accessible for the general public. However, thematic analysis has also been criticized for being too flexible, as it can be used across a range of epistemologies, which can lead to inconsistency and a lack of coherence when developing themes (Holloway & Todres, 2003). Nevertheless, consistency can be achieved by making explicit which is the epistemological position adopted by the researcher (Nowell et al., 2017).

In addition to this qualitative study (in Chapter 5), in the following chapters, self-report surveys were used. These methods are very common in psychological research and have a number of advantages over other methods: surveys can reduce researcher bias, are anonymous, and can achieve a large number of participants in a relatively short period of time (Frankfort-Nachmias & Nachmias, 1996). In addition, they are considered to be more cost-effective as they do not require professional training for administration. The

disadvantages of surveys include the use of simple questions that do not allow an in-depth examination of the complexities of the phenomenon under study, and a relatively low response rate. However, despite of these limitations, self-report methods questionnaires can be useful in providing an overall picture of a given phenomenon, by giving information about the inter-correlations among variables, which can be particularly relevant for generating important insights and derive hypothesis (Spector, 1994).

The mixing of quantitative with qualitative methods can also be considered a very challenging endeavour. In fact, some issues have been raised regarding the differences between these two methodologies in terms of epistemology (how we know what we know). For instance, quantitative researchers hold positions that are more consistent with positivist philosophy, which postulates that knowledge is demonstrated through its direct correspondence with observed events (Madill et al., 2000). Positivists believe in universal laws, and follow the methods used in natural sciences by testing theories and hypothesis, and claim for distance between researcher and the phenomenon studied, so biases can be avoided. Therefore, positivists search for objectivity and state that findings should be generalizable to all situations and contexts.

The methods of investigation emphasise objectivity, which can be demonstrated by the use of statistical analysis. For positivists, maximizing objectivity is associated with the production of reliable findings and knowledge (Brink, 1991). On the other hand, qualitative researchers hold positions that are more consistent with the interpretivist and constructionist paradigms (Johnson & Onwuegbuzie, 2004). Qualitative researchers argue that reality is socially constructed through proactive and purposive interaction with the world. They also challenge the notion of a universal knowledge, and defend that all truths are socially conditioned. Therefore, qualitative researchers also reject the notions of objectivity, as there is no objective 'extra-worldly or extra-social point of view' (Schmidt, 2001; p.138), and claim that the researcher and the phenomenon under study cannot be separated. For this research, the methodology used was concerned with interpretation, multiplicity, context, and depth.

In spite these differences of paradigms, a growing number of researchers have pointed out the importance of integrating quantitative and qualitative methods. In fact, by using both forms of data, researchers can simultaneously gain a deeper and thoughtful understanding of

a given phenomenon and generalize results from a sample to a population (Hanson et al., 2005). In addition, the paradigm that provides the best foundation for mixed methods research is the pragmatism (Tashakkori & Teddlie, 2003), which postulates that the researcher should choose the method and procedures that work best for answering the research question. A mixed method approach recognizes that both qualitative and quantitative approaches are useful, and attempts to minimize the weaknesses of a method and maximizes the strengths of other method in a single study or across studies (Johnson & Onwuegbuzie, 2004).

According to Punch (1998), mixed methods may be used to (a) further understand a research problem by converging numeric trends from quantitative data and by having a more in-depth knowledge about individuals' perceptions in a particular context from qualitative data; (b) identify important variables of a research phenomenon that may be measured subsequently through the use of existing instruments or by the development of new ones; (c) obtain statistical and quantitative data from a sample the population and use them to identify individuals who may expand on the results through qualitative data and results; and (d) convey the needs of individuals or groups of individuals who are marginalized or underrepresented. In the present thesis, the reasons that inspired the use of mixed methods are featured in points (a) and (b).

This thesis attempted to gain a deeper understanding of the phenomenon of youth gambling by exploring young individuals' perceptions of this behaviour, and also to estimate the prevalence of youth gambling, as well its relationship with other related variables in the samples used. Furthermore, the first qualitative exploratory study also identified relevant variables and generated further insights for future studies. In fact, the first study demonstrated which gambling games appeared to be more popular among youth, and also highlighted that youth (mainly adolescents) appeared to be prone to the development of gambling-related cognitive distortions, and thus suggested the importance of including this variable in subsequent quantitative studies. Moreover, the first study also showed that both adolescents and young adults use gambling as a method to obtain more excitement, especially when they feel more bored, which suggested the relevance of including sensation seeking in the model tested in Chapter 8.

### *Limitations and future research*

Throughout the present thesis, a number of limitations and avenues for future research emerged. This section briefly highlights a number of those, in addition to the ones presented in each of the empirical chapters. In fact, Chapters 7 and 8 presented cross-sectional research and therefore it only offered insights about the associations between the assessed variables, not about causal relationships. Therefore, longitudinal designs are encouraged in order to clarify the direction of relationship among the variables. This may shed light on which variables contribute to the development of youth problem gambling. In addition, it is recommended that longitudinal studies are conducted with a larger cohort of adolescents to track their gambling behaviour over time in order to understand if youth problem gambling is a transitory phenomenon or not. The implementation of longitudinal investigations are needed for obtaining a more accurate picture of the nature and foundations of developmental change (Magnusson & Stattin, 2006).

The studies in Chapters 7 and 8 showed that family variables (such as attachment to parents or other parental figures) do not show a direct association with youth problem gambling, and have a more indirect relationship with this behaviour, via coping strategies and sensation seeking. This highlights the importance of including family variables in future research on youth gambling behaviour. Therefore, future studies should continue to examine the role of attachment (a variable not very explored in the youth gambling literature, as this thesis had highlighted), but also investigate whether other family variables that also received less empirical attention, are correlated with adolescent gambling behaviour, such as family beliefs about money (McComb & Sabiston, 2010). In fact, the association between the role of family members' modelling behaviours and adolescent behaviour is widely recognized in the health behaviour literature and it has been included as a significant variable in theoretical models (Dickson, Derevensky & Gupta, 2002; Flay & Petraitis 1994). Therefore, it is recommended that future studies test a model in which family beliefs about money are related with youth problem gambling, and if attitudes towards gambling mediate this relationship.

The findings of these two studies (Chapter 7 and 8) showed that both sensation seeking and emotion focused-coping mediated the relationship between attachment and problem gambling. These findings can be explained by the Jacob's General Theory of Addictions, which was explained in Chapter 1, and which can be considered a plausible explanation for

the development of gambling addiction among adolescents. According to Jacobs (1989), an addiction can be defined by a dependent state acquired over time by a predisposed person in an attempt to relieve a chronic stress condition.

A physiological condition of either being chronically hyper-aroused or hypo-aroused is believed to be stress-inducing. A person with a hypertensive arousal state would likely find more relief in gambling. In both these examples, gambling serves to regulate and "normalize" physiological resting states. In fact, adolescent problem gamblers showed evidence of greater emotional distress, reported greater levels of physiological dissociation, and emotional predispositions, and therefore have a deliberate need to escape (Jacobs, 1989). Therefore, gambling severity was empirically found to be caused by the need to escape, or dissociate, which is fueled by aversive physiological and emotional states. Consequently, gambling, according to the model and Jacobs' theory, is a solution, or coping response, albeit a negative one, to aversive life conditions, which helps to explain the findings obtained in Chapter 7. More specifically, Jacobs views addictive behaviors as a form of self-treatment, considering they permit escape from a chronic stress condition. Gambling is conceptualized as the activity that provides the lacking stimulation, bringing upon dissociative states, and escape from emotional pain.

Support for this theory was provided by Martinez-Pina et al. (1991) who found that pathological adult gamblers reported feelings of inferiority and rejection in their childhood, and developed unhealthy patterns of attachment that led to experiencing dissociative states and higher levels of depression, which in turn led to gambling involvement. Individuals suffering from either of these extreme arousal levels are motivated to seek activities that correct the altered resting state with the goal of obtaining a more comfortable homeostatic state.

Support for this comes from other researchers who propose that gambling is engaged in to relieve depressive and hypomanic tendencies, anxiety, and low self-esteem. On the other hand, it remains plausible that a person with a hypotensive physiological arousal level may find relief in a stimulating and exciting activity such as gambling, temporarily eliminating their boredom and possible depression. It follows that such individuals would likely have a greater propensity for risk-taking and sensation-seeking than the norm, and therefore this explains the findings obtained in Chapter 8. Therefore, convergent evidence reveals that

excitement and escape from daily stressors were the primary motivations for gambling, providing support for Jacobs' theory (Kuley & Jacobs, 1988, Gupta & Derevensky, 1998).

Therefore, it can be concluded that, as gamblers have a physiological condition of either being chronically hyper-aroused or hypo-aroused, which is believed to be stress-inducing, and used an emotion-focused coping strategy in order to escape from these dissociative states, it can be hypothesised that sensation seeking represents a sub-set of emotion-focused behaviours for people that are hypo-aroused and need to eliminate their boredom that are experiencing.

Based on these two studies, and taking into account Jacon's General Theory of Addictions (1989), it would be useful to test a model in which both emotion-focused and sensation seeking could act as mediators in the relationship between attachment and problem gambling.

The intervention study (Chapter 9) did not examine students' perceptions and understanding of the program, or their opinions about what aspects of the program were useful. Therefore, it is recommended that qualitative techniques are used to obtain a more in-depth insight about the findings of the intervention, as it has been done in other intervention studies (e.g., Elander, Pittam, Lusher, Fox & Payne, 2010). Consequently, future gambling prevention initiatives should conduct focus group with participants that took part in the intervention in order to explore their perspectives and responses not captured by the post-test measures, and further clarify whether the intervention changed individuals' understanding about gambling, what they considered to be most helpful, and how the intervention could be improved.

Furthermore, there is a growing body of evidence which suggests that school-based prevention programs are more beneficial when they involve parents and teachers (Greenberg et al., 2003). Therefore, in order to increase the success of the intervention, future prevention efforts should provide training to parents and teachers, in which they should be instructed about the dangers and risk of gambling, and how to recognize the signs of problem gambling among teens. Moreover, parents could also be trained on other variables associated with more positive youth development, such as positive parenting techniques (Vitaro & Tremblay, 1994; Gershoff, Lansford, Sexton, Davis-Kean & Sameroff, 2012). In addition, it is advisable that the evaluation of the program also include parents and teachers' ratings of adolescent behaviour.



In terms of the variables that worked in the intervention, some evidence suggests that addressing positive youth development constructs can result in reductions of adolescent risky behaviours (Catalano et al., 2004). Among these constructs, some recent research has highlighted that mindfulness-based interventions can be very useful in improving adjustment among youth by enhancing their self-regulatory skills (Zoogman, Goldberg, Hoyt & Miller, 2015), and also in reducing substance use (Witkiewitz & Bowen, 2010; Skanavi, Laqueille & Aubin, 2011). Therefore, future gambling preventive initiatives could also incorporate mindfulness-based techniques in order to teach alternative responses to emotional discomfort, and to act less impulsively.

### ***Implications***

The studies presented in this thesis have made important contributions to the knowledge in the field of youth gambling, because they have tested novel models to further our understanding of this behaviour, and it examined the impact of an innovative prevention program in youth gambling behaviour. The studies conducted assume particular relevance particularly for the Portuguese context, where there is a lack of research on this field, and where the gambling landscape has recently changed with the legalization of online gambling in April 2015 (Decreto/Lei no 64/2015). This new act of the Parliament has placed Portugal similarly to other European countries, and leads to the recent recognition of gambling as an emergent public health issue by the Portuguese General Directorate of Addictions and Behaviours (SICAD, 2013).

The first empirical study of this thesis (Chapter 5) demonstrated that adolescents are relatively naive about the potential hazards of gambling, and cannot critically evaluate the mechanism of this activity. Thus, advertising for gambling products should contain accurate information about the gambling odds and the real chances of winning, as well as a warning statement that points out the risks associated with problematic gambling behaviour. Moreover, gambling advertisements should not be allowed to be shown on television during times when adolescents are more likely to be watching, especially in England where gambling advertisements actually take place. Additionally, in both England and Portugal, gambling advertisements should be banned from places where adolescents are more likely to be, such as shopping malls and on (and around) public transport.

The studies presented in Chapters 6 and 8 showed that Portuguese adolescents and young adults engaged in some form of gambling behaviours. Similarly, the studies presented in Chapters 7 and 8 showed that English youth also participated in gambling activities. Therefore, it is recommended that researchers pay greater attention to the development of gambling habits among young people in Portugal, England, and elsewhere. Thus, specific interventions, such as limiting access to gambling opportunities to young individuals (especially underage youth), and monitoring their activities deserves further consideration.

Moreover, Chapters 6, 7, and 8 showed that sports betting constituted one of the most played types of gambling reported by youth. In fact, it has been suggested that the rise in sports betting among young individuals is partly due to their belief that having knowledge of the sport will result in accurate predictions of the sport event (Gupta & Derevensky, 1998). Therefore, adolescents and emerging adults should be better educated about this particular form of gambling. In addition, gambling providers and regulators should develop more socially responsible advertisements for these gambling games. This can be achieved by displaying information about how the game works, and the real probabilities of winning, and by removing some youth-oriented features from the game, such as celebrity promoters, which have been shown to be appealing for youth (Monaghan, Derevensky, & Sklar, 2008).

Furthermore, findings in Chapters 6, 7, and 8 also demonstrated that some youth reported gambling online via free or practice sites or on social networking sites. This finding is particularly worrying, because nowadays young individuals are exposed to a growing number of opportunities to practice gambling without having necessarily to spend money, and therefore are being introduced to this activity very early in their lives. In addition, research suggests that individuals who have opportunities to engage in free-play sessions will bet significantly more than those who do not (Bednarz, Delfabbro, & King, 2013). Therefore, it is advised that these types of gambling activity should be regulated and monitored, and that free or practice games in these online sites should be prohibited from containing advertisements and direct links to online gambling websites.

Chapters 7 and 8 demonstrated that attachment to parents or other figures have an indirect relationship with problem gambling, via coping and sensation seeking respectively. More specifically, chapter 7 revealed that the attachment dimension of angry distress (related to anger towards attachment figures when attachment needs are frustrated) showed a significant

positive association with emotion-focused coping style, which in turn show a significant positive association with problem gambling; and chapter 8 revealed that young individuals who score higher on the attachment dimension of angry distress and lower on the attachment dimension of goal corrected partnership (related to the development of feelings of empathy and partnership with their attachment figure, and according to Bowlby constitutes the attachment dimension that indicates that a complete attachment bond has been formed) were more likely to present high levels of sensation seeking, which in turn was positively associated with problem gambling. These results have implications for both interventions and clinical practices. Therefore, it is recommended that interventions should be delivered to parents to recognise the attachment needs of their children, and also to foster their skills related to the core components of a complete attachment bond, such as parental sensitivity, partnership and mutuality, dyadic affect regulation, and parental reflective function (Moretti & Obsuth, 2009). In addition, during psychotherapeutic interventions with adolescent problem gamblers, parents or other primary attachment figures should be involved. For instance, parents should be advised that as children mature and enter in adolescent years, they should adjust their supervisory practices for this developmental period, and they should be instructed to accept and view conflict as a normative part of relationships, and particularly during adolescence, where individuals regularly communicate attachment needs (Markiewicz, Lawford, Doyle & Haggart, 2006), as well as to develop skills for negotiating conflict while still maintaining a good level of connection.

Furthermore, as study 8 have shown that the attachment dimension of availability had a positive relationship with sensation seeking, during the psychotherapeutic process, parents could be advised that in some moments, and for some specific situations, parents should not demonstrate too much availability to their kids for they do not perceive their surrounding environments and some circumstances as completely open and secure to explore. Parents should be instructed that for the development of solid patterns of attachment, as Bowlby (1982) has suggested, it is not enough that the attachment figure is perceived as available, but above all s/he needs to be perceived as willing to act responsively, dealing effectively with attachment related distress. Policymakers should also encourage the development of more “family friendly” policies which can promote more work life balance that facilitate parents spending more time with their kids, which in turn, facilitates the development of healthier patterns of attachment.

The study in Chapter 7 also demonstrated that adolescents and emerging adults who display emotion-focused coping, characterized by the use of strategies directed to regulate the negative emotions caused by the stressor (instead of using strategies directed to problem-solving) will be more likely to exhibit gambling problems. Therefore, during gambling prevention and psychotherapeutic initiatives, adolescents and emerging adults should be instructed about more adaptive coping strategies to deal with their life challenges, and not to use gambling as a way to escape from their problems (Wood & Griffiths, 2007). Moreover, the study in Chapter 8 demonstrated that adolescents and young adults who scored higher on sensation seeking, were more likely to have gambling problems. Thus, psychotherapeutic and preventive interventions may include working with young individuals in order to teach them to consider not only the more immediate consequences, but also the more long-term outcomes of this behaviour. Moreover, during these interventions, youth could also be instructed about alternative ways to meet their needs of excitement and sensation seeking, such as playing sports.

The study in Chapter 9 provided a solid foundation for the development of more research in the emergent field of youth gambling prevention initiatives, and that prevention initiatives can be potentially beneficial in school-based programs. The intervention study outlined here should encourage more research on youth gambling prevention programs and reinforces the need to focus gambling interventions on the correct knowledge about gambling and gambling-related misconceptions. Therefore, future school interventions should continue to target these variables by teaching students the independence of random events in a gambling game, and that is not possible to predict gambling outcomes based on the previous results. In addition, as the intervention presented showed some promising results, such as reducing the number of at-risk/problem gamblers, it is advisable to incorporate gambling prevention initiatives in the school curricula. Therefore, it is vital to identify school-level, district-level, and country-level policies and practices that could allocate more funding to research on youth gambling and that could further support the successful introduction and institutionalization of gambling school-based prevention programs. Moreover, structured manuals should be designed to support consistency in program delivery.

Further efforts are also needed to raise awareness among parents, teachers, and other educators, about gambling as a serious risky behaviour that can occur in adolescence, as well as the consequences that this behaviour can bring to youth and their families. These efforts

assume particular importance, because research suggests that gambling is viewed by parents, teachers, and youth as being the least serious of issues affecting youth (Derevenky, St-Pierre, Temcheff and Gupta, 2014; Kundu et al., 2013).

The perception of gambling as less risky may also suggest that it would be beneficial to incorporate gambling prevention initiatives in the prevention of other risky behaviours. In addition, to be more cost-effective, gambling prevention efforts should be linked and be informed by education concerning other risky behaviours. In fact, research suggests that there are some common risk factors: in fact, it has been found that adolescent problem gamblers are more likely to smoke, drink heavily, and consume illicit drugs (Suris et al., 2011; Calado, Alexandre & Griffiths, 2017a). Moreover, research shows that all these risky behaviours are predicted by high levels of impulsivity, sensation seeking, low parent monitoring and supervision, deviant peers, psychological distress, low self-esteem and emotion-focused coping (Cookson, 1994; Vitaro et al., 2001, Wanner et al., 2009).

Therefore, lessons from other prevention programs concerning other risky behaviours such as substance abuse can be learnt, and activities designed to target some of these common risk factors could be applied in gambling prevention programs, in order to make them more appealing and engaging to youth. Therefore, this risk-protective factor model could be used as a conceptual basis for designing youth prevention programs. Researchers, treatment providers, and educators would benefit from this risk-protective factor model in the prevention of problem gambling and other risky behaviors. Furthermore, global prevention efforts for general risky behaviours could be designed and implemented in schools, using a risk-protective approach, which could be composed by several units, and one unit could focus on one specific risky behaviour, including gambling.

In addition, head teachers and educational leaders who wish to implement effective gambling prevention programs in their schools should have access to research conducted on youth gambling to understand the factors and conditions that can make interventions work best. Over the next few years, researchers, head teachers, lead educators, and policymakers should work together to design efficient evidence-based, and coordinated youth prevention programs. Through these collaborations, it will be possible to ensure that no-one is left behind and that all young individuals have an opportunity to realize their full potential.

Selected important recommendations to stakeholders (e.g., researchers, treatment providers and policy makers) around youth problem gambling are summarized for Portugal and England in Table 1.

Table 1. Summary of the recommendations to the main stakeholders based on the findings of this thesis

<b>England</b>	<b>Portugal</b>
<b>Researchers</b>	
Conduct more research with larger samples and from different social groups	Conduct more research on gambling with Portuguese samples in order to examine if the relationships between gambling and other psychological variables found in other countries will also be replicated in Portugal.
Conduct more longitudinal studies to clarify causal risk factors preceding problem gambling and understanding distinct developmental pathways	Conduct more longitudinal studies to clarify causal risk factors preceding problem gambling and understanding distinct developmental pathways
Carry out more research with less explored variables in the literature (e.g., attachment) and with other non-researched factors (e.g., family beliefs about money) in order to confirm previous findings and to examine the relationship between unexplored variables and youth problem gambling behaviour	Carry out more research with less explored variables in the literature (e.g., attachment) and with other non-researched factors (e.g., family beliefs about money) in order to confirm previous findings and to examine the relationship between unexplored variables and youth problem gambling behaviour
Test a model in which sensation seeking and emotion-focused coping will mediate the relationship between attachment and problem gambling.	Test a model in which sensation seeking and emotion-focused coping will mediate the relationship between attachment and problem gambling.
<b>Educational and treatment providers</b>	
Raise awareness among parents, teachers and other educators about gambling as a risky behaviour that occurs in adolescence, and the consequences that this behaviour can bring	Raise awareness among parents, teachers and other educators about gambling as a risky behaviour that occurs in adolescence, and the consequences that this behaviour can bring
Deliver interventions that can foster the coping capacity in adolescents	Deliver interventions that can foster the coping capacity in adolescents
In the NHS, create more services designed to help young people that suffer from gambling-related issues. Create more helplines aimed to provide support for adolescents and young adults facing this problem.	Creation of youth centres and charities aimed to develop interventions to adolescent problem gamblers. In the Portuguese general directorate website, create a FAQ about adolescent problematic

	gambling in order to teach parents about how they should deal with this issue.
Deliver interventions to parents in order to foster their skills related to the core components of a secure attachment	Deliver interventions to parents in order to foster their skills related to the core components of a secure attachment
Involve parents during psychotherapeutic interventions with adolescent problem gamblers and teach parents how they should adjust their supervisory practices to their teenage children	Involve parents during psychotherapeutic interventions with adolescent problem gamblers, and teach them how they should adjust their supervisory practices to their teenage children.
In psychotherapeutic and preventive interventions, youth problem gamblers should be instructed about more adaptive coping strategies, and to consider not only the immediate outcomes, but also the more long-term consequences when deciding to engage in a behaviour	In psychotherapeutic and preventive interventions, youth problem gamblers should be instructed about more adaptive coping strategies, and to consider not only the immediate outcomes, but also the more long-term consequences when deciding to engage in a behaviour
<b>Policymakers</b>	
Limit access to gambling opportunities, especially to fruit machines, which are widely available in pubs, to young individuals and impose stricter penalties for gambling operators allowing underage youth to gamble. Set the age limit of 18 years to gamble in any gambling activity.	With the legalization of online gambling though the Act of the Parliament 64/2015, operators should limit access of online gambling to young people and also impose stricter penalties for gambling operators allowing underage people to gamble. In addition, parents should be educated about the risks of online gambling.
In advertisements for gambling products, always include accurate information about the gambling odds and the real chances of winning	In advertisements for gambling products, always include accurate information about the gambling odds and the real chances of winning
Restrict gambling advertisements to be shown during television times where adolescents are more likely to see, and ban gambling advertisements from places that adolescents are more likely to attend (e.g., in and around public transport, shopping malls, etc.).	Ban gambling advertisements from places that adolescents are more likely to attend (e.g., in and around public transport, shopping malls, discos, etc.).
Develop more “family friendly” policies	Develop more “family friendly” policies, and allow the possibility for employees to work in part-time, which is not so common in the country to promote a better work-life balance
Identify school, district and country-level policies that could support the successful introduction of gambling school-based prevention programs	Identify school, district and country-level policies that could support the successful introduction of gambling school-based prevention programs

### ***Overall conclusion***

In conclusion, the studies carried out in this thesis have confirmed the biopsychosocial model for the study of youth gambling behaviour. More specifically, this thesis has shown that youth gambling is influenced by individual, family, and cultural factors. Therefore, efforts to reduce problem gambling cannot be really efficacious if all these factors are not taken into account. Further research on youth gambling should examine how psychological characteristics and family variables might interact with each other to further understand how young individuals might engage in this behaviour.



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## Appendix I

### Declaration of Collaborative Work

#### **Literature review**

Calado, F., Alexandre, J., & Griffiths, M. D. (2017a). Prevalence of adolescent problem gambling: a systematic review of recent research. *Journal of Gambling Studies*, 33, 397-424 (Chapter 2)

Contribution of the first author (Filipa Calado) to this literature review:

- Initiation of review
- Development of key ideas
- Literature collection, and translation of studies which were not available in English
- Literature organisation
- Literature analysis
- Write-up
- Implementation of co-authors' feedback

#### **Empirical chapters**

Calado, F., Alexandre, J. & Griffiths, M. D. (2014). Mom, Dad it's only a game! Perceived gambling and gaming behaviors among adolescents and young adults: An exploratory study. *International Journal of Mental Health and Addiction*, 12, 772-794 (Chapter 5)

Contribution of the first author (Filipa Calado) to this study:

- Initiation of research
- Design of the focus group guide
- Involvement in participants' recruitment

- Conduction of six focus groups
- Data analysis
- Write-up
- Implementation of co-authors' feedback

Calado, F., Alexandre, J. & Griffiths, M. D. (2016). Portuguese validation of the DSM-IV-MR-J. *International Journal of Mental Health and Addiction*, 14, 1096-1106 (Chapter 6)

Contribution of the first author (Filipa Calado) to this study:

- Initiation of research
- Development of key ideas
- Development of the survey
- Participant recruitment
- Data collection
- Data cleaning
- Data analysis
- Write-up
- Implementation of co-authors' feedback

Calado, F., Alexandre, J., & Griffiths, M. D. (2017b). How coping styles, cognitive distortions, and attachment predict problem gambling among adolescents and young adults. *Journal of Behavioral Addictions*, 6(4), 648-657 (Chapter 7).

Contribution of the first author (Filipa Calado) to this study:

- Initiation of research
- Development of key ideas
- Development of the survey

- Participant recruitment
- Data collection
- Data cleaning
- Data analysis
- Write-up
- Implementation of co-authors' feedback

Calado, F., Alexandre, J., Griffiths, M.D (2018). A cross-cultural study between Portuguese and English youth, *International Journal of Mental Health and Addiction*, in press (Chapter 8).

Contribution of the first author (Filipa Calado) to this study:

- Initiation of research
- Development of key ideas
- Development of the survey
- Participant recruitment
- Data collection
- Data cleaning
- Data analysis
- Write-up
- Implementation of co-authors' feedback

Calado, F., Alexandre, J., Rosenfeld, L., Pereira, R. Griffiths, M.D (2018). The efficacy of a gambling prevention program among high-school students, *Journal of Gambling studies*, under review (Chapter 9)

Contribution of the first author (Filipa Calado) to this study:

- Initiation of research
- Development of key ideas
- Design of the intervention

- Participant recruitment
- Training of the students who delivered the intervention
- Data cleaning
- Data analysis
- Write-up
- Implementation of co-authors' feedback

## Appendix II

### Focus group guide

1. How do you usually spend your leisure time? What kind of things you do when you are not studying/working?
2. What do you think about gambling? Do you have many friends/people that you know who gamble?
3. What types of gambling games do you know?
4. Do you think that underage people have easy access to gambling?
5. Do you gamble or play via social networking sites?
6. Do you play online/offline or both?
7. Do you think that are common elements between gambling and gaming?
8. At what age do people usually start gambling?
9. How long do you usually engage in gambling? What was the longest time you ever spent gambling?
10. Why do you gamble? What are the motivations for gambling?
11. Who do you gamble with?
12. What do your family and friends think about gambling?
13. Do you think that some people can become addicted to gambling? What are the features of the game that leads people to have a problem or develop an addiction?
14. What do you think happens in people's lives after they start gambling?

## Appendix III

Scales used in the study presented in Chapter 6 (validation of the Portuguese DSM-IV-J-MR)

### Demographic information

1. Gender: Male \_\_\_\_\_ Female \_\_\_\_\_

2. Age \_\_\_\_\_

3. Which of the following people live in the same household as you?

Mother and Father \_\_\_\_\_

Mother \_\_\_\_\_

Father \_\_\_\_\_

Other \_\_\_\_\_



The following questions concern some gambling behaviours. Please think how these behaviours might be applicable to you in the past year.

1. In the past year, how often have you found yourself thinking about gambling or planning to gamble?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

2. During the course of the past year, have you needed to gamble with more and more money to get the amount of excitement you want?

Yes	No
-----	----

3. In the past year, have you ever spent much more than you planned to on gambling?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

4. In the past year, have you felt bad or fed up when trying to cut down or stop gambling?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

5. In the past year, how often have you gambled to help you to escape from problems or when you are feeling bad?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

6. In the past year, after losing money gambling, have you returned another day to try and win back money you lost?

Never	Less than half the time	More than half the time	Every time
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7. In the past year, has your gambling ever led to: lies to your family?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

8. In the past year, have you ever taken money from the following without permission to spend on gambling: school diner or fare money? Money from your family? Money from outside the family?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

9. In the past year, has your gambling ever led to arguments with family/friends or others, or missing school?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

1. How often do you gamble? Please tick the answer that you think is the most suitable one

Never \_\_\_\_\_

Less than once a month \_\_\_\_\_

Once a month \_\_\_\_\_

Once a week \_\_\_\_\_

2/3 times per week \_\_\_\_\_

Most days \_\_\_\_\_

2. What types of **offline** gambling activities do you most engage in?

	<b>Never</b>	<b>Rarely</b>	<b>Often</b>	<b>Very often</b>
Sports betting				
Scratchcards				
Lottery games				
Raffles or fundraising tickets				
Poker				
Slot machines				
Bingo				
Roulette				
Blackjack				
Instant win games when buying a product (e.g. chocolate bar, burger meals, etc.)				
Private bets (dice, cards for money)				
Television quizzes				
Other (please indicate) _____				

3. What types of **online** gambling activities do you most engage in?

	<b>Never</b>	<b>Rarely</b>	<b>Often</b>	<b>Very often</b>
Sports betting				
Scratchcards				
Lottery games				
Raffles or fundraising tickets				
Poker				
Slot machines				
Bingo				
Roulette				
Blackjack				
Free instant win games when buying an online product				
Betting exchanges				
“Free/demo” play sites (online gambling sites in which you can play for “practice”)				
Gambling with virtual money on social networking sites (e.g. poker on Facebook)				
Other (please indicate) _____				

4. Which was the biggest amount of money that you ever spent on gambling?

I never bet money on gambling \_\_\_\_\_

Less than 1 euro \_\_\_\_\_

Between 1 and 10 euros \_\_\_\_\_

Between 10 and 100 euros \_\_\_\_\_

Between 100 and 1000 euros \_\_\_\_\_

Sometimes, young people like to break the rules. Please read the following questions and think if you had been involved in any of these activities. During the past 12 months, have you:

		Never	Sometimes	Many times
1	Stolen money of > 10 Euros?			
2	Broken into house/building with intent to steal stuff?			
3	Stolen money of < 10 Euros?			
4	Stolen stuff that belonged to other people (e.g., mobile phone)			
5	Stolen goods from a shop while pretending to be a customer?			
6	Driven a car or motorbike at more than 120Km/h?			
7	Ignored a red light while driving a car?			
8	Stolen things or parts out of a car/motorbike?			
9	Participated in car racing?			
10	Driven without driving licence?			

11	Driven an unregistered car?			
12	Bought alcohol?			
13	Drunk alcohol in a public place?			
14	Smoked marijuana?			
15	Used hard drugs. e.g.. LSD, speed, ecstasy?			
16	Sold drugs?			
17	Driven a cadmotorbike when drunk?			
18	Taken part in a robbery. using a weapon/force?			
19	Used force to get things from others, e.g., money?			
20	Been involved (i.e., driving) in a hit-and-run accident?			

21	Used a weapon of some sort, e.g., knife?			
		Never	Sometimes	Many times
22	Deliberately damaged school property?			
23	Deliberately damaged public property?			
24	Deliberately damaged private property?			
25	Deliberately started a fire			
26	Tilted/hanged on vending/games machines			
27	Put graffiti on public places			
28	Taken part in a fist fight within a group situation			
29	Deliberately hurt or beat up someone			

30	Been suspended/expelled from school?			
31	Gone to see an R-rated film in the cinema?			
32	Tricked someone on the telephone?			
33	Got onto bus, into cinema and not paid fee?			
34	Not attended class /wagged school?			
35	Run away from home?			



Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree or a good part of time

3 Applied to me very much or most of the time

		0	1	2	3
1	I found it hard to wind down				
2	I was aware of dryness of my mouth				
3	I couldn't seem to experience any positive feeling at all				
4	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)				
5	I found it difficult to work up the initiative to do things				
6	I tended to over-react to situations				

7	I experienced trembling (e.g. in the hands)				
		0	1	2	3
8	I felt that I was using a lot of nervous energy				
9	I was worried about situations in which I might panic and make a fool of myself				
10	I felt that I had nothing to look forward to				
11	I found myself getting agitated				
12	I found it difficult to relax				
13	I felt down-hearted and blue				
14	I was intolerant of anything that kept me from getting on with what I was doing				
15	I felt I was close to panic				

16	I was unable to become enthusiastic about anything				
		0	1	2	3
17	I felt I wasn't worth much as a person				
18	I felt that I was rather touchy				
19	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)				
20	I felt scared without any good reason				
21	I felt that life was meaningless				

Below is a list of statements dealing with your general feelings about yourself.

Please indicate how strongly you agree or disagree with each statement.

	Strongly Disagree	Disagree	Disagree	Strongly disagree
1. On the whole, I am satisfied with myself				
2. At times I think I am no good at all.				
3. I feel that I have a number of good qualities				
4. I am able to do things as well as most other people.				
5. I feel I do not have much to be proud of				
6. I certainly feel useless at times				
7. I feel that I'm a person of worth, at least on an equal plane with others.				
8. I wish I could have more respect for myself				
9. All in all, I am inclined to feel that I am a failure				
10. I take a positive attitude toward myself				

## Appendix IV

Scales used in the studies presented in Chapter 7 and 8 (testing the mediation of coping and sensation seeking in the relationship between attachment and problem gambling respectively)

### Demographic information

1. Gender: Male \_\_\_\_\_ Female \_\_\_\_\_

2. Age \_\_\_\_\_

3. Which of the following people live in the same household as you?

Mother and father \_\_\_\_\_

Mother \_\_\_\_\_

Father \_\_\_\_\_

Other (please specify) \_\_\_\_\_

4. What is the highest level of schooling your father/mother completed?

Primary school or less \_\_\_\_\_

Attendance of secondary school \_\_\_\_\_

Completed secondary school \_\_\_\_\_

Some college or university \_\_\_\_\_

Completed college or university \_\_\_\_\_

The following questions concern some gambling behaviours. Please think how these behaviours might be applicable to you.

1. How often did you gamble during the past year?

Most days \_\_\_\_\_

2/3 times per week \_\_\_\_\_

Once a week \_\_\_\_\_

Once or twice a month \_\_\_\_\_

Less than once a month \_\_\_\_\_

Never \_\_\_\_\_

2. What types of **offline** gambling activities do you most engage in?

	<b>Never</b>	<b>Rarely</b>	<b>Often</b>	<b>Very often</b>
Sports betting				
Scratchcards				
Lottery games				
Raffles or fundraising tickets				
Poker				
Slot machines				
Bingo				
Roulette				
Blackjack				
Instant win games when buying a product (e.g. chocolate bar, burger meals, etc.)				
Private bets (dice, cards for money)				
Television quizzes				
Online games which you can win points that can be transferred in real money (e.g., MMORPGs)				
Other (please indicate) _____				

3. What types of **online** gambling activities do you most engage in?

	<b>Never</b>	<b>Rarely</b>	<b>Often</b>	<b>Very often</b>
Sports betting				
Scratchcards				
Lottery games				
Raffles or fundraising tickets				
Poker				
Slot machines				
Bingo				
Roulette				
Blackjack				
Free instant win games when buying an online product				
Betting exchanges				
“Free/demo” play sites (online gambling sites in which you can play for “practice”)				
Gambling with virtual money on social networking sites (e.g. poker on Facebook)				

Other (please indicate) _____				
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4. How many hours do you usually spend gambling on an average weekday (Monday to Friday) \_\_\_\_\_
5. How many hours do you usually spend gambling on a weekend day? \_\_\_\_\_

The following questions concern some gambling behaviours. Please think how these behaviours might be applicable to you in the past year.

- 1 In the past year, how often have you found yourself thinking about gambling or planning to gamble?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

- 2 During the course of the past year, have you needed to gamble with more and more money to get the amount of excitement you want?

Yes	No
-----	----

- 3 In the past year, have you ever spent much more than you planned to on gambling?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

- 4 In the past year, have you felt bad or fed up when trying to cut down or stop gambling?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

- 5 In the past year, how often have you gambled to help you to escape from problems or when you are feeling bad?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

- 6 In the past year, after losing money gambling, have you returned another day to try and win back money you lost?

Never	Less than half the time	More than half the time	Every time
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- 7 In the past year, has your gambling ever led to: lies to your family?



Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

- 8 In the past year, have you ever taken money from the following without permission to spend on gambling: school diner or fare money? Money from your family? Money from outside the family?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

- 9 In the past year, has your gambling ever led to arguments with family/friends or others, or missing school?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

The following questions are related to certain types of behaviour that some people might have. Please think how they might be applicable to you.

	1 Strongly disagree	2 Disagree	3 Neither disagree nor agree	4 Agree	5 Strongly Agree
I would like to explore strange places					
I get restless when I spend too much time at home					
I like to do frightening things					
I like wild parties					
I would like to take off on a trip with no pre-planned routes or timetables					
I prefer friends who are excitingly unpredictable					
I would like to try bungee jumping					

I would love to have new and exciting experiences, even if they are illegal					
---	--	--	--	--	--

The following questions are related to the relationship with the person in your life who raised you, that is, the person who mostly took care of you from the time you were born to age 5. Please indicate who is this person (mother, father, or other) and then fill in the answer that you consider as the most suitable one.

Mother \_\_\_\_\_ Father \_\_\_\_\_ Other (please indicate) \_\_\_\_\_

	1 Strongly disagree	2 Disagree	3 Neither disagree nor agree	4 Agree	5 Strongly Agree
My parent only seems to notice me when I am angry					
I often feel angry with my parent without knowing why					
I get annoyed at my parent because it seems I have to demand his/her caring and support					
I'm confident that my parent will listen to me					

I'm confident that my parent will try to understand of feelings					
I talk things over with my parent					
I enjoy helping my parent whenever I can					
I feel for my parent when he/she is upset					
It makes me feel good to be able to do things for my parent					

The items below express how you use to handle with stress in your life. There are many ways to try to deal with problems and each item expresses a particular way of dealing with them. Please use the response alternatives from 0 (*I haven't been doing this at all*) to 3 (*I've been doing this a lot*)

	0	1	2	3
I've been concentrating my efforts on doing something about the situation I'm in				
I've been taking action to try to make the situation better				
I've been trying to come up with a strategy about what to do				
I've been thinking hard about the next steps to take				
I've been turning to work or other activities to take my mind off things				
I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping				
I've been saying to myself "this isn't real"				
I've been refusing to believe that it has happened				

The next few questions are things that some people have said about gambling.  
Please indicate how much **you** agree or disagree with each one.

	1 Strongly disagree	2 Disagree	3 Neither agree or disagree	4 Agree	5 Strongly Agree
People should have the right to gamble whenever they want					
There are too many opportunities for gambling nowadays					
Gambling should be discouraged					
Most people who gamble do so sensibly					
Gambling is dangerous for family life					
On balance gambling is good for society					
Gambling livens up life					
It would be better if gambling was banned altogether					

Please indicate the extent to which you agree with the value expressed in each statement (1 = strongly disagree; 2 = moderately disagree; 3 = mildly disagree; 4 = neither agree or disagree; 5 = mildly agree; 6 = moderately agree; 7 = strongly agree)

	1	2	3	4	5	6	7
Gambling makes me happier							
I can't function without gambling							
Praying helps me win							
Losses when gambling, are bound to be followed by a series of wins							
Relating my winnings to my skill and ability makes me continue gambling							
Gambling makes things seem better							
It is difficult to stop gambling as I am so out of control							
Specific numbers and colours can help increase my chances of							

winning							
A series of losses will provide me with a learning experience that will help me win later							
	1	2	3	4	5	6	7
Relating my losses to bad luck and bad circumstances makes me continue gambling							
Gambling makes the future brighter							
My desire to gamble is so overpowering							
I collect specific objects that help increase my chances of winning							
When I have a win once, I will definitely win again							
Relating my losses to probability makes me continue gambling							
Having a gamble helps reduce tension and stress							



I'm not strong enough to stop gambling							
I have specific rituals and behaviours that increase my chances of winning							
There are times that I feel lucky and thus, gamble those times only							
Remembering how much money I won last time makes me continue gambling							
I will never be able to stop gambling							
I have some control over predicting my gambling wins							
If I keep changing my numbers, I have less chances of winning than if I keep the same numbers every time							

## Appendix V

### Scales used in the study presented in Chapter 9 (Pre-test, Post-test and follow-up assessment of the prevention program)

Before you start to respond to the survey, please indicate the month of your birthday, the first two letters of your mother first name and the last two digits of your telephone number.

\_\_\_\_/\_\_\_\_/\_\_\_\_/\_\_\_\_/\_\_\_\_/\_\_\_\_/

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#### Demographic information

1. Gender: Male \_\_\_\_\_ Female \_\_\_\_\_
  2. Age \_\_\_\_\_
  3. Year of grade: \_\_\_\_\_
- 

The following questions concern some gambling behaviours. Please think how these behaviours might be applicable to you.

1. How often did you gamble during the last two months?

Never \_\_\_\_\_

Less than once a month \_\_\_\_\_

Once a month \_\_\_\_\_

Several times per month \_\_\_\_\_

Once a week \_\_\_\_\_

2/3 times per week \_\_\_\_\_

Most days \_\_\_\_\_

2. Which was the biggest amount of money that you ever spent on gambling?

I never bet money on gambling \_\_\_\_\_

Less than 1 euro \_\_\_\_\_

Between 1 and 10 euros \_\_\_\_\_

Between 10 and 100 euros \_\_\_\_\_

Between 100 and 1000 euros \_\_\_\_\_

3. How many hours do you usually spend gambling on an average weekday (Monday to Friday) \_\_\_\_\_

4. How many hours do you usually spend gambling on a weekend day? \_\_\_\_\_

—

The following questions concern some problematic gambling behaviours. Please think how these behaviours might be applicable to you in the past two months.

1. In the past two months, how often have you found yourself thinking about gambling or planning to gamble?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

2. Have you needed to gamble with more and more money to get the amount of excitement you want?

Yes	No
-----	----

3. Have you ever spent much more than you planned to on gambling?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

4. Have you felt bad or fed up when trying to cut down or stop gambling?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

5. How often have you gambled to help you to escape from problems or when you are feeling bad?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

6. After losing money gambling, have you returned another day to try and win back money you lost?

Never	Less than half the time	More than half the time	Every time
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7. Has your gambling ever led to: lies to your family?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

8. Have you ever taken money from the following without permission to spend on gambling: school diner or fare money? Money from your family? Money from outside the family?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

9. Has your gambling ever led to arguments with family/friends or others, or missing school?

Never	Once or twice	Sometimes	Often
-------	---------------	-----------	-------

The next few questions are things that some people have said about gambling.

Please indicate how much **you** agree or disagree with each one.

	1 Strongly disagree	2 Disagree	3 Neither agree or disagree	4 Agree	5 Strongly Agree
People should have the right to gamble whenever they want					
There are too many opportunities for gambling nowadays					
Gambling should be discouraged					
Most people who gamble do so sensibly					
Gambling is dangerous for family life					
On balance gambling is good for society					
Gambling livens up life					
It would be better if gambling was banned altogether					

The next questions comprise some opinions about gambling. Please indicate how much **you** agree or disagree with each one. Put an X in the number that corresponds to your opinion.

	1 I Totally disagree	2 I Disagree	4 I Agree	5 I Totally Agree
When I'm betting, I must know the tricks and strategies if I want to win				
I don't have more chances to win at the lottery if I choose my numbers myself				
Betting is a good way to obtain money quickly				
Betting money is a good way to take up a challenge				
Anyone can stop betting easily				
Betting money can become a problem like alcoholism and drug addiction				
Buying lottery tickets is a type of gambling				
All pinball machines and electronic games are not considered as gambling activities				
Gamblers have no control on the gains and losses in a gambling activity				

At lottery, choosing numbers based on the numbers that came out most often during the year can be a good way to increase your chances to win.				
It is impossible to predict chance				
When I play bingo, I have more chances of winning if I bring my lucky charm with me.				
It is impossible to predict the winner or the loser at any gambling activity				
If I lose while gambling, it's because I played badly				
If I gamble often at a game of chance and money, I can become good and win more money				
If I play lottery 6/49, I have more chances to win if I choose my lucky numbers				

The following questions are related to certain types of behaviour that some people might have. Please think how they might be applicable to you.

	1 Strongly disagree	2 Disagree	3 Neither disagree nor agree	4 Agree	5 Strongly Agree
I would like to explore strange places					
I get restless when I spend too much time at home					
I like to do frightening things					
I like wild parties					
I would like to take off on a trip with no pre-planned routes or timetables					
I prefer friends who are excitingly unpredictable					
I would like to try bungee jumping					
I would love to have new and exciting experiences, even if they are illegal					



