Negative Anticipated Emotions and the Theory of Planned Behaviour in Adolescent Gambling Behaviours and Problem Gambling Prevention

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Abstract

The theory of planned behaviour (TPB) has been a major theoretical approach used to guide adolescent health behaviour research, including research aimed at the formulation of effective behaviour-change interventions for adolescent risky and addictive behaviours. Despite increased attention to the TPB and its related construct of negative anticipated emotions (NAE) in the gambling and prevention literature, there is a paucity of research investigating the utility of an extended TPB model (which includes NAE) in the context of adolescent gambling behaviour and in the prevention of adolescent gambling problems. The current program of research sought to validate this paradigm as a comprehensive model for understanding adolescent gambling behaviour and as a guiding framework for school-based problem gambling prevention initiatives. This dissertation comprises two manuscripts that collectively make a unique contribution to the literature. The first manuscript reports an investigation of the explanatory value of the extended TPB for adolescent gambling frequency and problems. Structural equation models were estimated, using cross-sectional data collected from 419 high school students (ages 14-17), in order to determine the significance of both direct and indirect effects of NAE and the TPB components on the frequency of gambling and on perceived gambling problems. The results supported an extended TPB as a valid framework for explaining adolescent gambling behaviour and problems. Attitudes, perceptions of behavioural control, and NAE were observed to influence gambling intentions. Intentions and attitudes were also found to have a direct relationship with frequency of gambling behaviour, while intentions and perceptions of behavioural control were directly related to problem gambling behaviours. The results nevertheless suggested certain deviations from the TPB as it applies specifically to adolescent gambling, with subjective norms not found to be significantly associated with gambling

intentions. The second study expanded upon findings from Study 1, and examined the efficacy of targeting NAE and key TPB constructs in a universal adolescent gambling preventive intervention for eliciting changes in gambling beliefs, intentions and behaviours. Effects of the intervention across time (i.e., pre-intervention, post-intervention, follow-up) were examined with hierarchical mixed models, using multiply imputed data collected from 280 high school students. The results revealed that the preventive intervention was ineffective in producing changes in NAE, the TPB's key constructs, or the frequency of gambling behaviour in the desired direction over time. The findings suggest that application of an extended TPB model to *existing* adolescent problem gambling preventive interventions does not necessarily elicit behaviour change. Taken together, findings from these studies suggest that while the extended TPB is a suitable framework for describing the cognitive processes involved in adolescent gambling intention formation behaviour, further elaboration of the extended TPB framework may be needed for understanding gambling behaviour and for formulating effective prevention initiatives. Future research in this area is needed to increase our understanding of the importance of various cognitive and heuristic elements in the context of adolescent gambling and problem gambling prevention practice.

Résumé

La théorie du comportement planifié (TCP) est une approche théorique reconnue pour informer la recherche sur les comportements de santé des adolescents, y compris la recherche visant le développement d'interventions efficaces qui ciblent la modification des comportements à risque et la dépendance des adolescents. Malgré une attention accrue à la TCP et son concept connexe d'émotions anticipées négatives (EAN) dans la littérature portant sur les jeux d'argent et la prévention de comportements à risques, il y a une pénurie de recherches qui évaluent l'utilité de la TCP (qui comprend les EAN) dans le contexte des comportements de jeu et dans la prévention des problèmes de jeu chez les adolescents. Ce programme de recherche visait à valider cette approche théorique pour expliquer les comportements de jeu chez les adolescents, ainsi que pour informer les initiatives de prévention de jeu problématique en milieu scolaire. Cette thèse comprend deux manuscrits qui apportent une contribution unique à la littérature. Le premier manuscrit représente une enquête sur l'utilité de la TCP (qui comprend les EAN) pour expliquer la fréquence des comportements de jeu et les problèmes de jeu chez les adolescents. En se servant de données transversales recueillies auprès de 419 élèves du secondaire (âgés de 14-17 ans), des modèles d'équations structurelles ont été estimés afin de déterminer l'importance des liens entre les EAN, les composants de la TCP, la fréquence de jeu et les problèmes de jeu parmi les adolescents. Les résultats supportent la validité de la TCP comme cadre théorique pour expliquer les comportements et les problèmes de jeu chez les adolescents. Plus précisément, les résultants indiquent que les attitudes, le contrôle comportemental perçu, et les EAN ont une influence sur les intentions de participer aux jeux d'argent. Également, les résultats indiquent que les intentions et les attitudes ont un lien direct avec la fréquence des comportements de jeu, tandis que les intentions et les perceptions de contrôle comportemental sont directement liés aux

problèmes de jeu. Néanmoins, les résultats suggèrent que, parmi les adolescents, certaines différences se retrouvent. Contrairement aux résultats de recherche antérieurs, les normes subjectives ne se sont pas avérées significativement reliées aux intentions de participer aux jeux d'argent. La deuxième étude a été conçue pour élargir les résultats de la première étude en examinant l'efficacité d'un programme de prévention universel (qui ciblait les EAN et les concepts clés de la TCP) pour modifier les intentions et les comportements de jeu. En servant des données recueillies auprès de 280 élèves du secondaire (traités avec la méthode d'imputation multiple par Markov Chain Monte-Carlo), des modèles hiérarchiques mixtes ont été utilisées pour estimer les effets du programme de prévention. Les résultats ont révélé que le programme de prévention était inefficace pour modifier les EAN, les éléments de la TCP, ou la fréquence du comportement de jeu. Les résultats suggèrent que l'application du modèle TCP aux programmes de prévention de jeu problématique *déjà existants* ne suscite pas nécessairement des changements de comportement chez les adolescents. Dans l'ensemble, les résultats de ces études suggèrent que la TCP (qui comprend EAN) est un cadre théorique approprié pour décrire les processus cognitifs impliqués dans la formation de l'intention de participer au jeu. Toutefois, les résultats de ces deux études suggèrent aussi qu'une élaboration supplémentaire du modèle TCP est nécessaire pour mieux expliquer les comportements de jeu et pour développer des programmes de prévention plus efficaces. Des futures recherches dans ce domaine sont nécessaires pour accroître notre compréhension de l'importance des divers éléments cognitifs et heuristiques dans le contexte des comportements de jeux d'argent et de la prévention du jeu problématique chez les adolescents.

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Contributions of Authors

The studies reported in this dissertation are co-authored, although I am the primary author on both manuscripts. The first manuscript is co-authored with Drs. Jeffrey L. Derevensky, Caroline E. Temcheff, and Rina Gupta. Conversely, the second manuscript is co-authored with Drs. Caroline E. Temcheff, Jeffrey L. Derevensky, and Rina Gupta. As primary author, I played a lead role in conceptualizing each of these studies, including selection of instruments, research questions, and data analyses, as well as wrote the current dissertation in its entirety. My doctoral co-supervisors, Drs. Derevensky and Temcheff, have served in an advisory capacity during the conceptualization of these studies, formulation of the research questions, and writing of the manuscripts. Both Drs. Temcheff and Derevensky were also responsible for the overall management of the research grant. Further, Dr. Temcheff was involved in data collection for both manuscripts. Finally, Dr. Gupta served in an advisory capacity during the initial conceptualization of this dissertation, as well as in the revision of the manuscripts. This work was supported by the Social Sciences and Humanities Research Council of Canada (SSHRC) under Grant number 430-2012-0467, awarded to Drs. Temcheff and Derevensky.

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CHAPTER I

Introduction

Adolescent gambling and, in particular, problem gambling has emerged as a significant global public health concern (Dickson-Gillespie, Rugle, Rosenthal, & Fong, 2008; Korn, 2000; Messerlian, Derevensky, & Gupta, 2005). On an international scale, the liberalisation, expansion, regulation and active promotion of gaming activities has led to an increased visibility, easier accessibility and greater availability of gambling opportunities for individuals (Derevensky, Sklar, Gupta, & Messerlian, 2010). However, with the proliferation and active promotion of gambling opportunities have also come a number of subsequent problems and adverse consequences for at-risk populations, with adolescents being identified as especially vulnerable (Derevensky, 2012). Indeed, there is also abundant research evidence to suggest that participation in gambling can become excessive and lead to significant problems for a meaningful proportion of adolescents (Volberg, Gupta, Griffiths, Ólason, & Delfabbro, 2010).

Although the prevalence of problem gambling among adolescents has been fairly established in the extant literature, the reasons why young people may start to gamble or may gamble excessively are not completely understood. Several predictors and correlates of adolescent gambling and problem gambling behaviour have already been identified, including gender, age, parental gambling behaviours, gambling outcome expectancies, and gambling attitudes (Delfabbro & Thrupp, 2003; Gillespie, Derevensky, & Gupta, 2007; Shead, Derevensky, & Gupta, 2010; Temcheff, St-Pierre, & Derevensky, 2013). However, few studies with adolescents have accounted for the possible connections among the predictors (Lee, 2013), with the exception of the ‘Pathways Model’ (see Gupta, Nower, Derevensky, Blaszczynski, Faregh, & Temcheff, 2013). Advances in the understanding of problem gambling are proposed to

rely heavily on the development of comprehensive models of gambling behaviour that define the associations between predictors (Blaszczynski & Nower, 2002). Consequently, research investigating the explanatory value of different comprehensive models of gambling behaviour will be fundamental for achieving a more complete understanding of early gambling initiation, its maintenance, and excessive play behaviour among adolescents. This research will also serve to guide future prevention and intervention efforts.

The theory of planned behaviour (TPB; Ajzen, 1991, 2002) is one social cognition model that is recognized for providing a significant contribution to understanding the relationships between established predictors for a range of adolescent health behaviours (e.g., contraceptive use, smoking, drug use, and alcohol consumption). The TPB framework has also attracted considerable attention from researchers and psychologists interested in the formulation of effective behaviour-change interventions for multiple health behaviours. This situation has prompted researchers to advocate for increased consideration of the TPB as a framework for describing gambling behavioural decision-making processes (Cummings & Corney, 1987; Martin et al., 2010) and for developing gambling prevention programs (Evans, 2003).

The validity of the TPB model for explaining young adult gambling and problem gambling behaviour has been empirically investigated and received some support (e.g., Martin, Nelson, Usdan, & Turner, 2011; Martin et al., 2010; Wu & Tang, 2012). However, one element largely ignored by the TPB is the impact of emotions or anticipated affective reactions on decision-making processes (Gibbons, Houlihan, & Gerrard, 2009; Richard, de Vries, & van der Pligt, 1998; van der Pligt & de Vries, 1998), which is problematic given evidence to suggest that gambling behaviour is influenced by emotional experiences and emotion regulation abilities (Brown, Rodda, & Phillips, 2004; Gee, Coventry, & Birkenhead, 2005; Hills, Hill, Mamone, &

Dickerson, 2001). As such, researchers have begun to explore the role of negative anticipated emotions (NAE) in the context of gambling, and initial findings suggest their importance in gambling decision-making (e.g., Li et al., 2010; Risen & Gilovich, 2007; Sheeran & Orbell, 1999; Wolfson & Briggs, 2002; Zeelenberg & Pieters, 2004).

Despite increased recognition of and attention to the TPB and the related construct of NAE in the gambling literature, there is little available research that has investigated the utility of the TPB model for explaining adolescent gambling behaviour, or how it may inform the design of school-based problem gambling preventive initiatives. As a first step, the current program of research serves to validate an extended TPB framework, which includes NAE, for understanding adolescent gambling decision-making and behaviour. In addition, the current program of research examined the suitability of this extended TPB model for the evaluation of school-based problem gambling prevention initiatives.

This dissertation includes two publication-style manuscripts that, together, represent a continuous progression of research exploring the utility of the TPB in the context of adolescent gambling. Specifically, Manuscript 1 proposes structural equation models that assess the direct and indirect effects of NAE and the TPB's critical components for the frequency of adolescent gambling behaviour and for gambling-related problems. This study offers a substantial contribution to the field by providing evidence for the validity of an extended TPB as it applies specifically to younger adolescents. Thus, this first manuscript seeks to lay the groundwork for future studies examining the value of the TPB for the design of school-based problem gambling preventive initiatives and the evaluation of their effects.

Subsequently, Manuscript 2 presents the results from an investigation of the efficacy of a universal, school-based problem gambling prevention tool for eliciting changes in the

theoretically important predictors of adolescent gambling behaviour. Existing prevention programs have generally aimed to increase knowledge about gambling and problem gambling and reduce erroneous cognitions. Some of the more comprehensive programs have also targeted the development of adolescent decision-making, problem-solving, emotion regulation and self-control skills. This study offers an original contribution to the utility of the TPB for the development of school-based problem gambling prevention initiatives. It is the first of its kind to explore the impact of targeting NAE and key TPB constructs for eliciting changes in adolescent gambling beliefs, intentions and behaviours.

The two related manuscripts are presented in Chapters III and IV, each containing its own introduction and literature review, as well as methods, results, and discussion sections. The dissertation begins with a comprehensive review of the literature (Chapter II) to provide justification for this program of research, and ends with an overarching conclusion section (Chapter V) that summarizes and integrates the findings of the two manuscripts. The reader will find some redundancy in the introductions and methods of the otherwise independent studies presented in this dissertation, as each addresses the same general topic and incorporates the same population.

CHAPTER II

Review of the Literature

Adolescent Gambling and Problem Gambling: Present State of Knowledge

Previously considered an adult activity, researchers in North America, Europe, and Australasia have consistently documented that adolescents manage to gamble on both regulated and unregulated activities (Stinchfield, 2011; Volberg et al., 2010; Welte, Barnes, Tidwell, & Hoffman, 2009). Although adolescent gambling behaviour may be transitory and may not necessarily lead to adult gambling (Delfabbro, King, & Griffiths, 2014; Delfabbro, Winefield, & Anderson, 2009), there is evidence that the onset of gambling behaviour in pre-adolescence or adolescence is associated with, or a marker for vulnerability to, later development of gambling problems (Rahman et al., 2012; Slutske et al., 2014; Vitaro, Wanner, Ladouceur, Brendgen, & Tremblay, 2004). Additionally, findings from both national and international prevalence studies reveal that an identifiable proportion of adolescents gamble excessively and experience significant problems. Despite a lack of consensus as to the actual prevalence of severe gambling problems resulting from jurisdictional differences and the use of diverse survey methodologies and instruments, recent estimates nevertheless suggest that approximately 0.9–8.1% of adolescents, internationally, meet *DSM-IV* diagnostic criteria for pathological gambling (Volberg et al., 2010). These estimates are disquieting since they appear to parallel or exceed prevalence rates found in the general adult population (which are established to be between 0.4–4.7%; Stucki & Rihs-Middel, 2007).

Also of concern is that adolescent gambling problems are found to be associated with greater frequency of play and greater gambling expenditure, as well as serious concomitant and subsequent health, psychological, legal, and social problems. Specifically, significant positive

associations have been found between gambling frequency and problem gambling symptoms in adolescents, with gambling expenditures observed to increase proportionally with degree of gambling-related problems (Hansen & Rossow, 2008). In addition, gambling problems in adolescents have been shown to be concomitant with academic difficulties, poor or disrupted family relationships, alcohol and substance use problems, delinquency, mental health issues, and suicidality (Cook et al., 2014; Shead et al., 2010; Volberg et al., 2010). Gambling problems amongst young people are further observed to be prospectively associated with depression (Dussault, Brendgen, Vitaro, Wanner, & Tremblay, 2011) and criminal behaviour (Wanner, Vitaro, Carbonneau, & Tremblay, 2009) in early adulthood. The adverse and potentially long-term implications of adolescent gambling and gambling problems on health and well-being underscore the importance of prevention among this vulnerable population.

The Prevention of Adolescent Gambling

In the areas of physical, mental and public health, prevention is acknowledged to be a priority as critical as treatment (Dickson-Gillespie et al., 2008). A recent report from the National Research Council and Institute of Medicine (2009) reveals that there is emerging evidence for the cost-effectiveness of prevention initiatives for mental, emotional and behavioural (MEB) disorders, including addictions. Drawing on existing research, the report estimated that the annual cost of MEB disorders among youth totalled approximately $247 billion in 2007 in the United States alone, and concluded that the potential value of prevention of MEB disorders among youth is considerable. Dickson-Gillespie et al. (2008) contend that the development and implementation of evidence-based prevention initiatives that minimize the harms and social costs associated with problematic gambling behaviour should therefore remain a high priority.

Prevention initiatives can be conceptualized into three levels based on the risk characteristics of each target group: universal, selective, and indicated prevention (Dickson, Derevensky, & Gupta, 2004; Dickson-Gillespie et al., 2008; National Research Council and Institute of Medicine, 2009). Universal prevention promotes informed choice and encourages the use of decision-making processes to prevent or postpone initiation into problematic behaviour within a population that has not been identified on the basis of relative risk for developing a problem. Selective prevention is directed at individuals or subpopulations at increased vulnerability for a problematic behaviour or disorder but that are currently asymptomatic, and screening for potential problems is the principal strategy of this prevention effort. Indicated prevention targets individuals at high or above-average risk who present with early detectable signs of a problematic behaviour or disorder but do not meet diagnostic levels, and aims to inhibit further harm by decreasing risk factors or promoting protective factors.

A number of initiatives have been developed and implemented to prevent gambling-related problems among young people, with most being school-based and targeting high school students. These prevention initiatives can be grouped into two broad categories: a) *gambling-specific psychoeducational prevention programs* and (b) *gambling-specific psychoeducational and skills training prevention programs*. The goal of gambling-specific psychoeducational prevention programs is to increase awareness or knowledge about gambling and issues related to problem gambling (Derevensky, Gupta, Dickson, & Deguire, 2004; Ladouceur, Goulet, & Vitaro, 2012). The underlying premise of this approach is that young people are usually misinformed about the risks of the targeted problem behaviour and that educating them on the psychosocial consequences of the problem behaviour will deter or postpone initiation (Lantz et al., 2000). Although the content is diverse, gambling-specific psychoeducational prevention

programs generally present one or more of the following types of information: the nature of gambling, gambling odds and probabilities, erroneous cognitions and gambling fallacies, warning signs of problem gambling, and consequences associated with excessive gambling (Derevensky et al., 2004; Ladouceur et al., 2012; Williams, Wood, & Currie, 2010).

In contrast to gambling-specific psychoeducational prevention programs, gambling-specific psychoeducational and skills training prevention programs recognize that misinformation or knowledge deficits are only one of many factors associated with initiation of youth problem gambling, and therefore go beyond merely presenting factual information (Ladouceur et al., 2012; Williams, Connolly, Wood, Currie, & Davis, 2004). Their approach to prevention of youth problematic behaviour is to influence attitudes related to the behaviour with a focus on skills development to cope with potentially high-risk situations (Lantz et al., 2000). Gambling-specific psychoeducational and skills training prevention programs typically have a broad scope of themes that are covered, which include enhancement of self-esteem and self-image, development of interpersonal skills to better cope with stressful life events, development of problem-solving and decision-making skills, and development of skills for resisting peer pressure (Derevensky et al., 2004; Ladouceur et al., 2012; Williams et al., 2010).

Efficacy of Adolescent Gambling Prevention Programs

While a number of available adolescent gambling prevention initiatives have been implemented in school settings, there have been a limited number of published evaluations to date. A summary of studies investigating the effectiveness of gambling prevention programs is provided in Table 2.1. Specifically, 12 studies of gambling-specific psychoeducational prevention programs, and an additional 7 studies of gambling-specific psychoeducational and skills training prevention programs, are examined.

Table 2.1

Empirical Studies Evaluating Youth Gambling Prevention Programs

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
		Gambling-specific psychoeducational prevention programs		
Ferland, Ladouceur, & Vitaro (2002)	• Cognitive model.	• Participants: students in grades 7 and 8 from two high schools (total $N = 424$; mean age = 13.1 years; range 11-15 years). • Experimental design. • Conditions: video only condition; lecture/activities condition; combined video and lecture/activities condition; control condition. • 'Lucky' video was a 20-minute French-language educational film on knowledge and misconceptions about gambling. • Lecture/activities consisted of a presentation of information about gambling with interactive activities. • Measurement intervals: pre-intervention, post-intervention (1 week after intervention). • Questionnaire assessed knowledge about gambling (Cronbach $\alpha = 0.74$) and misconceptions about gambling (Cronbach $\alpha = 0.58$).	• Statistically significant increase in knowledge about gambling observed for all three intervention conditions (video only, lecture/activities, combined video and lecture/activities) but not for control condition. • Statistically significant decrease in misconceptions about gambling observed for all three intervention conditions but not for control condition. • Combined video and lecture/activities condition significantly better than video only condition for decreasing misconceptions about gambling.	• No measure of gambling behaviours. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Lavoie & Ladouceur (2004)	• Cognitive model.	• Participants: students in grades 5 and 6 from two primary schools (total $N = 273$; mean age = 11.53 years; range 10-13 years). • Experimental design. • Conditions: video only condition; combined video and discussion/activities condition; control condition. • French-language 'Lucky' video used. • Discussion/activities consisted of a 20-minute presentation of information about gambling with interactive activities. • Measurement intervals: pre-intervention, post-intervention (after recess). • Same questionnaire as Ferland et al. (2002).	• Statistically significant increases in knowledge about gambling observed for both intervention conditions (video only, combined video and discussion/activities) but not for control condition. • Statistically significant decreases in misconceptions about gambling observed for both intervention conditions but not for control condition. • No statistically significant differences between the two intervention conditions in increasing knowledge or reducing misconceptions about gambling.	• No measure of gambling behaviours. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Ladouceur, Ferland, & Vitaro (2004)	• Cognitive model.	• Participants: students in grades 7 and 8 from four high schools (total $N = 371$; mean age = 12.8 years; range 12-15 years). • Experimental design. • Conditions: video (experimental) condition; control condition. • English-language translation of the 'Lucky' video used. • Measurement intervals: pre-intervention, post-intervention (1 week after intervention). • English-language translation of Ferland et al. (2002) questionnaire used.	• Statistically significant increase in knowledge about gambling observed for experimental condition but not for control condition ($\eta^2 = 0.02$). • Statistically significant decrease in misconceptions about gambling observed for experimental condition but not for control condition ($\eta^2 = 0.04$).	• No measure of gambling behaviours. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Ladouceur, Ferland, & Fournier (2003)	• Cognitive model.	• Study 1 participants: students in grades 5 and 6 from three primary schools (total N = 153). • Study 2 participants: students in grades 5 and 6 from same schools (total N = 356). • Experimental design for both studies. • Study 1conditions: experimental condition; control condition. • Study 2 conditions: teacher-delivered 'Count Me Out' condition; specialist-delivered 'Count Me Out' condition; specialist-delivered exercises condition. • Study 1 experimental condition consisted of a one-session program (60 minutes) with exercises for raising awareness about randomness and chance in gambling. • Study 2 compared study 1 exercises with the 'Count Me Out' intervention. • Measurement intervals: pre-intervention, post-intervention (after program delivery). • Same questionnaire as Ferland et al. (2002).	• Statistically significant decrease in gambling-related misconceptions observed for experimental condition but not for control condition in study 1, even for students with a high baseline level of gambling-related misconceptions (i.e., three or more errors). • Prevention programs delivered by a gambling specialist were observed to be more effective at reducing misconceptions than those delivered by teachers in study 2. • Prevention exercises delivered by gambling specialists were observed to be more effective at reducing misconceptions than the 'Count Me Out' intervention delivered by either gambling specialists or teachers in study 2. • For students with a high baseline level of gambling-related misconceptions, 'Count Me Out' intervention delivered by gambling specialists observed to be most effective at reducing misconceptions in study 2.	• No measure of gambling behaviours. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Ladouceur, Ferland, Roy, Pelletier, Bussières, & Auclair (2004)	• Cognitive model.	• Study 1participants: students in grades 7 and 9 from two high schools (total $N = 345$). • Study 2 participants: students in grades 7 to 9 from four high schools (total $N = 520$). • Same experimental design, conditions, and measurement intervals as Ladouceur et al. (2003). • Questionnaire assessed understanding of notions of chance and randomness.	• Statistically significant decrease in gambling-related misconceptions observed for experimental condition but not for control condition in study 1, even for students with a high baseline level of gambling-related misconceptions (i.e., three or more errors). • No statistically significant differences between the three conditions in reducing gambling-related misconceptions observed in study 2. • For students with a high baseline level of gambling-related misconceptions, exercises delivered by gambling specialists were observed to be more effective at reducing misconceptions than the 'Count Me Out' intervention delivered by teachers in study 2.	• No explicit information provided regarding the psychometric properties of questionnaire assessing gambling-related misconceptions. • No measure of gambling behaviours. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Ladouceur, Ferland, Vitaro, & Pelletier (2005)	• Cognitive model.	• Participants: students in grades 11 and 12 from three high schools (total $N = 568$). • Experimental design. • Conditions: video (experimental) condition; control condition. • 'Gambling Stories' video was a 20-minute educational film designed to inform adolescents on the possible consequences of excessive gambling and to increase awareness about youth problem gambling. • Measurement intervals: pre-intervention, post-intervention (1 month after intervention). • Questionnaire assessed overall knowledge of gambling (Cronbach $\alpha = 0.61$), knowledge of excessive gambling (Cronbach $\alpha = 0.69$), and misconceptions about gambling (Cronbach $\alpha = 0.64$). Test-retest reliability at one-month interval was good ($r = 0.7$). • Post-intervention questionnaire also assessed intention to gamble in the forthcoming year.	• Statistically significant increase in overall knowledge about gambling observed for experimental condition but not for control condition. • Statistically significant increase in knowledge about excessive gambling observed for experimental condition but not for control condition. • Statistically significant decrease in stereotypical perceptions of problem gamblers observed for experimental condition but not for control condition. • Significantly fewer students in the experimental condition reported an intention to gamble in the forthcoming year.	• No measure of gambling behaviours. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Vitaro, Paré, Trudelle, & Duchesne (2005)	• Theoretical model not explicitly stated.	• Participants: students in grades 10 and 11 from 13 high schools (total N = 2,848). • Experimental design. • Conditions: untrained teachers intervention condition; trained teachers intervention condition; control condition. • 'LE JEU CHEZ LES JEUNES: Atelier de sensibilisation et de prévention – Niveau II' is a one-session program providing information about gambling, gambling-related erroneous cognitions, and the characteristics of youth problem gambling. • Measurement intervals: pre-intervention, post-intervention (2-3 months after intervention). • Questionnaire assessed overall knowledge of gambling and excessive gambling (Cronbach α = 0.75-0.85), gambling-related erroneous cognitions (Cronbach α = 0.78-0.83), attitudes about gambling (Cronbach α = 0.67-0.76), attitudes about gambling prevention and treatment (Cronbach α = 0.55), gambling frequency and problem gambling behaviours (Cronbach α = 0.85-0.90).	• Statistically significant increases in overall knowledge about gambling and excessive gambling, and statistically significant decreases in gambling-related erroneous cognitions observed for both intervention conditions (untrained teachers, trained teachers) but not for control condition. • Statistically significant increases in responsible gambling attitudes and statistically significant decreases in negative attitudes about gambling prevention and treatment observed for both intervention conditions but not for control condition. • No statistically significant changes observed for gambling frequency or problem gambling behaviours. • Teachers who received training about gambling were more effective at reducing erroneous cognitions and negative attitudes than untrained teachers.	• No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Lemaire, de Lima, & Patton (2004)	• Theoretical model not explicitly stated.	• Participants: students in grades 7 and 8 from public high schools (total $N = 894$). • Experimental design. • Conditions: intervention condition; control condition. • 'It's Your Lucky Day' is a one-session program providing information about gambling, randomness and probability, risk-taking, decision-making, community resources available. • Measurement intervals: pre-intervention, post-intervention (1 month after intervention). • Questionnaire assessed knowledge of the definition of gambling, knowledge of how gambling works, misconceptions about gambling, knowledge of the symptoms of pathological gambling, and knowledge of available community resources.	• Statistically significant increase in knowledge about the definition of gambling observed for intervention condition but not for control condition. • Statistically significant increase in knowledge of how gambling works observed for intervention condition but not for control condition. • Statistically significant decrease in misconceptions about gambling observed for intervention condition but not for control condition. • No statistically significant change observed for knowledge of the symptoms of pathological gambling.	• No explicit information provided regarding the psychometric properties of questionnaire assessing gambling-related knowledge. • No measure of gambling behaviours. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Turner, Macdonald, Bartoshuk, & Zangeneh (2008)	• Reasoned action framework.	• Participants: students in grades 5 to 12 from 18 schools (total $N = 374$). • Experimental design. • Conditions: intervention condition; control condition. • Intervention consisted of a one-hour presentation of information about gambling with discussions, interactive activities, and brief skits. • Measurement intervals: pre-intervention, post-intervention (2 months after pre-test). • Questionnaire assessed knowledge of the nature of random events (Random Events Knowledge Test [REKT]), knowledge of luck and skill, attitudes towards gambling, coping skills for stressful situations, gambling frequency and problem gambling behaviours (South Oaks Gambling Screen Revised for Adolescents [SOGS-RA]).	• Statistically significant increase in knowledge about random events observed for intervention condition but not for control condition ($\eta^2 = 0.02$). • No statistically significant change observed for knowledge of luck and skills, attitudes towards gambling, coping skills, gambling behaviours or problem gambling behaviours.	• No explicit information provided regarding the psychometric properties of scales assessing gambling-related knowledge. • No long-term follow-up measurement after 2-month post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Taylor & Hillyard (2009)	• Theoretical model not explicitly stated.	• Participants: students ages 8–18 from drawn from primary schools, junior high schools, high schools, and a juvenile detention center (total N = 8,455). • Time series experimental design (no control group). • Intervention consisted of a 45-minute presentation of information with activities and discussion. Students also receive CD-ROM with interactive activities to reinforce learning following program completion. • Measurement intervals: pre-intervention, post-intervention (after program delivery). • Questionnaire assessed knowledge of gambling and its associated dangers (Cronbach $\alpha = 0.58$). A measure of problem gambling behaviours (Modified South Oaks Gambling Screen [MSOGS]; Cronbach $\alpha = 0.87$) was also included in the pre-intervention questionnaire but not in the post-intervention questionnaire.	• Statistically significant increase in knowledge about gambling and its associated dangers observed for intervention condition but not for control condition. • Primary school students observed to show the greatest increase in knowledge from pre- to post-intervention, and high school students observed to show the least improvement in knowledge. • Males were observed to show greater increase in knowledge from pre- to post-intervention than females.	• Absence of control condition. • No long-term follow-up after post-intervention measurement. • No post-intervention measure of gambling behaviours.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Walther, Hanewinkel, & Morgenstern (2013)	• Adapted from drug use prevention approach; theoretical model not explicitly stated.	• Participants: students in grades 6 and 7 from 27 schools (total N = 2,109; mean age = 12.0 years). • Quasi-experimental design (non-random assignment to conditions). • Conditions: intervention condition; control condition. • Intervention consisted of a 90-minute presentation of information on gambling with activities and discussion. This gambling unit was one of four units completed by the students. • Measurement intervals: pre-intervention, post-intervention. Post-intervention measurement was completed at different times for the intervention group (mean of 31 weeks after pre-test) and control group (mean of 20 weeks after pre-test). • Questionnaire assessed knowledge about gambling and related misconceptions (Cronbach α = 0.60), gambling attitudes and beliefs (Cronbach α = 0.75), lifetime gambling behaviour and gambling frequency.	• Statistically significant increases in knowledge about gambling and gambling related-misconceptions observed for both intervention condition and control condition, but gains in knowledge greater for students in the intervention group (Cohen's d = 0.18). • Statistically significant increase in negative attitudes and beliefs towards gambling observed for intervention condition compared to control condition (Cohen's d = 0.15). • Statistically significant reduction in the number of current gamblers observed between pre- and post-test for intervention condition compared to control condition (Cohen's d = 0.02).	• Non-random assignment of subjects to control condition. • Differences in measurement intervals between and within control and intervention groups. • Observed effects cannot be attributed specifically to gambling prevention unit since students completed three other prevention units for Internet use, online communication and computer gaming. • No long-term follow-up after post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Todirita & Lupu (2013)	• Cognitive-behavioural model.	• Participants: students in grade 6 from one school (total N = 81; age range = 12-13 years). • Experimental design. • Conditions: information condition; rational emotive education (REE) condition; control condition. • Information intervention, delivered using computer software, consisted of a presentation of information about gambling with interactive activities designed to teach students to replace gambling-related misconceptions, cognitive errors, and positive attitudes with rational and correct conceptions. • REE intervention consisted of a presentation of information about the connections between emotions, cognitions and behaviours. • Measurement intervals: pre-intervention, post-intervention (10 weeks after pre-test). • Questionnaire assessed gambling-related misconceptions, erroneous cognitions, and attitudes.	• Statistically significant increases in gambling-related knowledge observed for both intervention conditions but not control condition from pre- to post-intervention. • Gambling-related knowledge observed to be significantly greater in the information than REE intervention condition.	• Intervention and control samples drawn from only one school; limits generalizability of the findings. • No explicit information provided regarding the psychometric properties of scales assessing gambling-related knowledge. • No long-term follow-up after 10-week post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
		Gambling-specific psychoeducational and skills training prevention programs		
Gaboury & Ladouceur (1993)	• Adapted from alcohol prevention approach; theoretical model not explicitly stated.	• Participants: junior and senior students from five high schools (total $N = 289$; mean age = 16 years). • Experimental design. • Conditions: intervention condition; control condition. • Intervention consisted of a three-session curriculum (75 minutes per session) providing information about gambling and strategies for coping with gambling behaviour. • Measurement intervals: pre-intervention, post-intervention; six-month follow-up. • Questionnaire assessed knowledge about gambling, attitudes towards gambling, gambling behaviours (South Oaks Gambling Screen [SOGS]).	• Knowledge about gambling and coping skills improved post-intervention for students in intervention condition but not for control condition. • Improvements in knowledge were maintained at follow-up. • Improvements in coping skills were not maintained at follow-up. • No statistically significant change in students' actual gambling behaviour or attitudes towards gambling at post-intervention and follow-up.	• No information provided regarding the psychometric properties of scales assessing gambling-related knowledge and attitudes.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Ferland, Ladouceur, & Vitaro (2005)	• Adapted from smoking, alcohol and drug prevention approach; Theoretical model not explicitly stated.	• Participants: junior high school students from eight high schools (total N = 1,193; mean age experimental group = 13.3 years; mean age control group = 13.8 years; range = 12-14 years). • Experimental design. • Conditions: intervention condition; control condition. • Intervention was an adaptation of the curriculum used in Gaboury & Ladouceur (1993). Sessions were reduced to 60 minutes in length, and a supplemental module covering strategies for coping with peer pressure was incorporated. • Measurement intervals: pre-intervention, post-intervention; 3-month follow-up; 6-month follow-up. • Questionnaire assessed knowledge about gambling (Cronbach α = 0.74), gambling-related attitudinal errors (Cronbach α = 0.58), social problem-solving skills (Inventaire de resolution de problèmes sociaux revisé [IRPS-R]), gambling frequency and problem gambling (DSM-IV-MR-J; Cronbach α = 0.75).	• Statistically significant increase in gambling-related knowledge observed for intervention condition but not control condition from pre- to post-intervention. • Statistically significant decrease in attitudinal errors observed for intervention condition but not control condition from pre- to post-intervention. • Improvements in knowledge were maintained at 6-month follow-up. • Continued decrease in attitudinal errors was observed from pre-intervention to 6-month follow-up. • No statistically significant changes in students' social problem-solving skills or gambling frequency at post-intervention or follow-up. •	• Unable to assess the impact of curriculum on gambling-related problems given low base rate of problems reported.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Williams (2002)	• Adapted from existing prevention programs; theoretical model not explicitly stated.	• Participants: students in grades 10 to 12 from 2 schools (total $N = 439$; mean age = 15.4 years; range 14-19 years). • Experimental design. • Conditions: intervention condition; control condition. • Intervention consisted of a five-session curriculum (80 minutes per session) providing information about the nature of gambling and problem gambling, activities to increase students' understanding of erroneous cognitions and gambling fallacies, and teaching and rehearsal of decision-making, social problem-solving and adaptive coping skills. • Measurement intervals: pre-intervention, 1-week post-intervention; 3-month follow-up. • Questionnaire assessed knowledge of gambling, ability to calculate odds, erroneous cognitions, gambling attitudes, coping skills, gambling frequency, expenditure, and problem gambling (DSM-IV-MR-J).	• Statistically significant increase in knowledge about gambling observed for intervention condition but not control condition from pre- to post-intervention. • Statistically significant decreases in positive attitudes towards and erroneous cognitions about gambling observed for intervention condition but not control condition from pre- to post-intervention. • Statistically significant increase in ability to calculate gambling odds for both intervention and control conditions from pre- to post-intervention. • Changes in knowledge, attitudes, and erroneous cognitions were maintained at follow-up, but not the change in ability to calculate gambling odds. • No statistically significant changes in actual gambling behaviour (frequency, time spent, money won, money lost) or change in problem gambling at post-intervention and follow-up.	• Intervention and control samples drawn from only one school each; limits generalizability of the findings. • No explicit information provided regarding the psychometric properties of scales assessing gambling-related knowledge, gambling attitudes, and ability to calculate gambling odds.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Williams, Connolly, Wood, Currie, & Davis (2004)	• Adapted from existing prevention programs; theoretical model not explicitly stated.	• Participants: students in grades 9 to 12 from 12 schools (total N = 578; mean age = 16.2 years). • Same experimental conditions and prevention curriculum as Williams (2002). • Measurement intervals: pre-intervention and follow-up (3 months after intervention). Measures also collected after each session but not analyzed in this study. • Questionnaire assessed knowledge of gambling and problem gambling, awareness of erroneous cognitions, gambling attitudes, decision-making and coping skills, gambling frequency, gambling expenditure, and problem gambling (DSM-IV-MR-J). Scales are reported to have been previously validated and show good 1-month test-retest reliability, as well as good concurrent and predictive validity. However, results for the scale validation are reported elsewhere in an unpublished technical report.	• Statistically significant increases in gambling knowledge and in awareness of erroneous cognitions observed for intervention condition but not control condition from pre-intervention to follow-up. • Statistically significant increase in negative gambling attitudes observed for intervention condition but not control condition from pre-intervention to follow-up. • Statistically significant decreases in time spent gambling and gambling expenditure intervention condition but not control condition from pre-intervention to follow-up. • Increases in gambling knowledge, awareness of erroneous cognitions, and negative gambling attitudes found to be predictive of decreases in time and money spent gambling. • No statistically significant changes in decision-making and coping skills, or in problem gambling at follow-up.	• Post-intervention measurement collected but not analyzed; limits conclusions regarding the maintenance of observed changes over time. • No data provided regarding the psychometric properties of scales assessing gambling-related knowledge, awareness of erroneous cognitions, gambling attitudes, or decision-making and problem-solving skills.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Williams, Wood, & Currie (2010)	• Adapted from existing prevention programs; theoretical model not explicitly stated.	• Participants: students in grades 9-12 from 10 schools (total N = 1,240; mean age = 16.0 years; range 14-20. • Same prevention curriculum as Williams et al. (2004). An optional sixth booster session was delivered to some participants at minimum one month later (standard program: n = 682; booster program: n = 267). • Conditions: standard intervention condition; booster intervention condition ; control condition. • Measurement intervals: pre-intervention and post-intervention (3 to 7 months after intervention). • Same questionnaire as Williams et al. (2004). Scales measured knowledge of gambling and problem gambling, awareness of erroneous cognitions (1-month test-restest reliability; r = .69), gambling attitudes (1-month test-restest reliability; r = .78), decision-making and coping skills, gambling frequency, gambling expenditure, and problem gambling (DSM-IV-MR-J; Cronbach α = 0.75).	• Statistically significant increases in gambling knowledge, negative gambling attitudes, and decision-making and coping skills observed for both intervention conditions but not control condition from pre- to post-intervention. • Statistically significant decreases in erroneous cognitions observed for both intervention conditions but not control condition from pre- to post-intervention. • Statistically significant decreases in proportion of current gamblers and gambling frequency for both intervention conditions but not control condition from pre- to post-intervention. • Knowledge and negative attitudes observed to be significantly greater in the booster than standard condition. • No statistically significant change in gambling expenditure or in proportion of problem gamblers at follow-up.	• No long-term follow-up measurement after 3-7 month post-intervention measurement; limits conclusions regarding the maintenance of observed changes over time. • Differences in measurement intervals between and within control and intervention groups.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Turner, Macdonald, & Somerset (2005)	• Pathways model of gambling and problem gambling.	• Participants: students in grades 7 to 13 (total $N = 392$; age range = 12-21). • Experimental design. • Conditions: intervention condition; control condition. • Intervention consisted of a six-session curriculum (70 minutes per session) with a seventh booster session providing information about the nature of random events and the impact of emotions experienced during gambling on decision-making, as well as teaching and rehearsal of adaptive coping skills and self-monitoring. • Measurement intervals: pre-intervention, post-intervention (10-12 weeks after pre-test). • Questionnaire assessed knowledge of the nature of random events (REKT; Cronbach $\alpha = 0.70$), knowledge of gambling probabilities, knowledge of luck and skill, knowledge of problem gambling and self-monitoring skills, coping skills for stressful situations (Preventative Resources Inventory [PRI], and problem gambling behaviours (SOGS-RA; Cronbach $\alpha = 0.87$).	• Statistically significant increase in knowledge about random events observed for intervention condition but not for control condition ($\eta^2 = 0.014$). • No statistically significant change observed for knowledge of gambling probabilities, knowledge of luck and skill, knowledge of problem gambling and self-monitoring skills, coping skills, or problem gambling behaviours.	• No explicit information provided regarding the psychometric properties of scales assessing knowledge of gambling probabilities, knowledge of luck and skill, knowledge of problem gambling and self-monitoring skills, and coping skills for stressful situations (PRI). • No long-term follow-up after 10-12 week post-intervention measurement.

Table 2.1 (*continued*)

Study	Theoretical model or framework	Study characteristics/design	Key findings	Study limitations
Turner, Macdonald, & Somerset (2008)	• Cognitive-behavioural theory and reasoned action framework.	• Participants: students in grades 10 to 12 (total $N = 201$; age range = 15-18). • Same experimental design, conditions, and measurement intervals as Macdonald et al. (2005). • Intervention was an adaptation of the curriculum used in Macdonald et al. (2005). Adaptations were geared towards enhancing compliance with the curriculum content, and included requiring teaching of all modules, requiring increased and consistent student access to curriculum materials, and transfer of CD-ROM content to VHS video. • Questionnaire assessed knowledge of the nature of random events (REKT; Cronbach $\alpha = 0.70$), knowledge of problem gambling and self-monitoring skills (Cronbach $\alpha = 0.61$-0.69), knowledge of coping strategies, coping skills (PRI; Cronbach $\alpha = 0.74$-0.91), and problem gambling behaviours (SOGS-RA; Cronbach $\alpha = 0.87$).	• Statistically significant increase in knowledge about random events observed for intervention condition but not for control condition ($\eta^2 = 0.104$). • Statistically significant improvement in knowledge about self-monitoring skills observed for intervention condition but not for control condition ($\eta^2 = 0.053$). • Statistically significant increase in knowledge about coping strategies observed for intervention condition but not for control condition ($\eta^2 = 0.056$). • No statistically significant change observed for coping skills or problem gambling behaviours.	• No explicit information provided regarding the psychometric properties of scale assessing knowledge of coping strategies. • No long-term follow-up after 10-12 week post-intervention measurement.

Among the gambling-specific psychoeducational prevention programs that have been empirically evaluated in the extant literature, the majority have demonstrated improvements in participants' knowledge about gambling and/or excessive gambling (Ferland, Ladouceur, & Vitaro, 2002; Ladouceur, Ferland, & Vitaro, 2004; Ladouceur, Ferland, Vitaro, & Pelletier, 2005; Lavoie & Ladouceur, 2004; Lemaire, de Lima, & Patton, 2004; Taylor & Hillyard, 2009; Turner, Macdonald, Bartoshuk, & Zangeneh, 2008; Vitaro, Paré, Trudelle, & Duchesne, 2005; Walther, Hanewinkel, & Morgenstern, 2013). Several of the prevention programs assessed have also shown reductions in participants' erroneous cognitions or misconceptions about gambling (Ferland et al., 2002; Ladouceur, Ferland, & Fournier, 2003; Ladouceur, Ferland, Roy, Pelletier, Bussières, & Auclair, 2004; Ladouceur, Ferland, & Vitaro, 2004; Lavoie & Ladouceur, 2004; Lemaire et al., 2004; Todirita & Lupu, 2013; Vitaro et al., 2005; Walther et al., 2013). However, no study has demonstrated that these gains in knowledge or reductions in misconceptions are maintained over time. Although alterations in knowledge and misconceptions about gambling are assumed to be a precondition for eliciting changes in gambling behaviour, only three studies have actually examined the effectiveness of existing programs in producing behavioural modifications (Turner, Macdonald, Bartoshuk, et al., 2008; Vitaro et al., 2005; Walther et al., 2013). Of the programs that have been assessed, only one was successful in modifying gambling behaviour by reducing the number of current gamblers immediately following the delivery of the intervention (Walther et al., 2013).

With regards to the gambling-specific psychoeducational and skills training prevention programs that have been empirically evaluated, almost all have shown improvements in participants' knowledge about gambling and/or excessive gambling and reductions in their erroneous cognitions or misconceptions about gambling (Ferland, Ladouceur, & Vitaro, 2005;

Gaboury & Ladouceur, 1993; Gaboury & Ladouceur, 1993; Turner, Macdonald, & Somerset, 2008; Williams, 2002; Williams et al., 2004, 2010). In addition, there is some evidence that these improvements in knowledge or decreases in misconceptions are maintained for 3 to 6 months following the delivery of the prevention program (Ferland et al., 2005; Gaboury & Ladouceur, 1993; Williams, 2002). A small number of the prevention programs evaluated have also been observed to stimulate the development of more negative attitudes toward gambling (Williams, 2002; Williams et al., 2004, 2010). Of interest, certain prevention programs also produced actual behavioural changes, with improvement observed in participants' coping, applied decision-making and problem-solving skills (Turner, Macdonald, & Somerset, 2008; Williams et al., 2010), as well as reductions in the frequency of gambling participation (Williams et al., 2004, 2010).

According to Nation et al. (2003) and Weissberg, Kumpfer, and Seligman (2003), there are several characteristics associated with effective youth prevention programs that have been identified in the extant literature. These characteristics include: (1) are comprehensive and incorporate a combination of interventions to address the salient precursors or mediators of the problem behaviour; (2) use diverse teaching methods that focus on increasing awareness of the problem behaviour and on acquiring or enhancing skills; (3) have a theoretical justification, are based on accurate information, and are supported by empirical research; (4) are tailored to the community, cultural and developmental norms of the participants and make efforts to include the target group in program planning; and (5) adapt evidence-based programming through ongoing intervention evaluation and continuous quality improvement. Further, Michie and Prestwich (2010) have recently proposed characteristics of interventions that effectively apply theory to the development and evaluation of behaviour change. These characteristics include: (1) the relevant

theoretical constructs are targeted; and (2) the theory is used to select participants or to tailor the intervention to the target population.

Based on the above characteristics, it is evident that existing school-based problem gambling prevention initiatives need to continue to be tested for their effectiveness and receive ongoing evaluation for program refinement (Derevensky et al., 2004). Several of the empirical studies lacked behavioural measures of gambling or follow-up evaluations after post-test measurement. Without measurement of gambling behaviour and post-test follow-ups, it is difficult to draw firm conclusions regarding the transfer of learning to actual gambling behaviour or learning retention over time (Ladouceur et al., 2012).

Additionally, considering that the principal goal of any prevention initiative is to decrease the incidence of a potential problematic behaviour, there is a clear need for the development of school-based problem gambling prevention initiatives in the context of new theoretical models of behavioural change in order to improve the likelihood of sustained successful outcomes (Williams et al., 2010). To date, many of the existing prevention programs have been developed in the absence of a clear theoretical framework describing the expected causal mechanisms by which the program exerts its effect. However, even under conditions where a preventive intervention is "theory-based", it is often unclear exactly how the theory was used in its development (Webb, Sniehotta, & Michie, 2010). Further, health and social cognition research has suggested that other factors can play an influential role in behaviour change. These factors include: perceptions of risk in performing the behaviour; notions of self-efficacy; and intentions or motivations to change the behaviour (Ogden, 2012). It is therefore plausible that the effectiveness of existing prevention initiatives is generally restricted because they fail to target all of the salient factors found to influence behaviour change. This situation has led researchers

to propose consideration of the TBP (Ajzen, 1991, 2002) as an alternate framework that could more accurately describe gambling behavioural decision-making processes (Cummings & Corney, 1987).

The Theory of Planned Behaviour

The TPB is a recognized social cognition framework used to explain and predict a range of human behaviours (Ajzen, 1991, 2002). The TPB is an extension of the earlier theory of reasoned action (TRA; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The TPB proposes that the execution of any behaviour is determined by the individual's intention to exert effort and complete an action. The theory further asserts that intentions are influenced by three independent factors: attitudes, subjective norms, and perceptions of behavioural control (PBC). Attitudes consist of an individual's overall positive or negative evaluations of the behaviour. Subjective norms are an individual's perceptions of social pressure from important others to perform or not perform the behaviour. PBC represent an individual's expectations about the level of ease or difficulty in executing the behaviour. It is important to note that PBC is considered to influence performance of behaviours both directly and indirectly through an interaction with behavioural intentions. First, PBC is said to moderate the relationship between intentions and behaviour (e.g., an intention to quit smoking will be amplified as the individual perceives to have control over smoking behaviour, and this will increasingly lead to subsequent quitting behaviour). The impact of PBC on behaviour can also be direct where perceptions of control are accurate or realistic: when PBC is accurate, it provides useful information about the actual control an individual can exercise in the performance of a specific behaviour (Ajzen, 2002). An illustration of the proposed causal relationships within the TPB is provided in Figure 2.1.

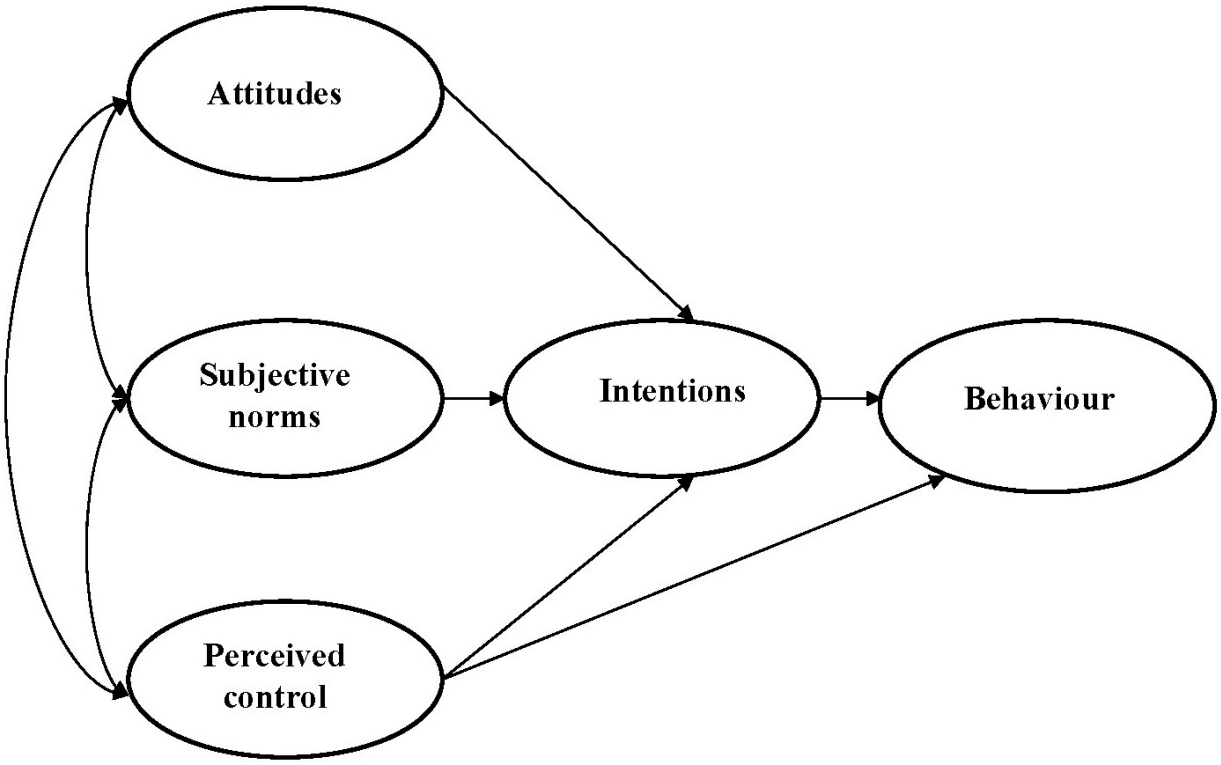

Figure 2.1. Conceptual illustration of the theory of planned behaviour

Application of the TPB in the Prediction of Gambling Behaviours

The explanatory value of the TPB model for young adult gambling and disordered gambling behaviour has received some empirical support. Martin et al. (2010) investigated the predictive relationships between the TPB components (i.e., attitudes, subjective norms, PBC, intentions) and past-year gambling participation, as well as the frequency of participation. They observed that gambling-related attitudes, subjective norms, and PBC were predictive of the frequency of gambling participation, and that intentions to gamble mediated the relationship between gambling frequency and the other TPB determinants. Conversely, only subjective norms and PBC were found to be significant predictors of past-year gambling, with the relationship between PBC and past-year gambling mediated by gambling intentions.

Consistent with Martin et al. (2010), Wu and Tang (2012) observed that positive gambling attitudes, positive subjective norms regarding gambling, and a poor sense of control over gambling refusal were predictive of intentions to gamble, accounting for approximately 56% of the explained variance in young adult gambling intentions. They also indicated that gambling intentions and perceived control over resisting gambling are the most proximal predictors of problem gambling behaviour, and that gambling intentions mediate the relationship between problem gambling behaviour and the other TPB determinants.

Of interest, Martin et al. (2011) observed differences in the explanatory value of the TPB between problem and non-problem young adult gamblers. Specifically, they found that for non-problem gamblers, attitudes, subjective norms, and PBC were predictive of gambling frequency, and that intentions to gamble mediated the relationship between gambling frequency and the other TPB constructs. Conversely, for problem gamblers, intentions did not mediate the association between the components of the TPB and gambling frequency, as none of the TPB

components were predictive of gambling intentions. Rather, it was found that gambling-related attitudes independently predicted gambling frequency among this group.

To date, only one published study has explored the relationships between TPB components and gambling behaviour among younger youths. Drawing from a sample of 757 secondary school and 250 university students (aged 14–25 years), Moore and Ohtsuka (1997) found that intentions to gamble were modestly associated with gambling-related attitudes and subjective norms, accounting for 13–15% of the explained variance. Additionally, they observed that gambling frequency was predicted most strongly by intentions to gamble (24–26% of explained variance). It should, however, be noted that PBC was not included as a factor in the model.

Taken together, these results provide preliminary evidence for the applicability of the TPB in the understanding youth gambling intentions and actual behaviour. Overall, attitudes, subjective norms and PBC account for a moderate proportion of the variance in behavioural intentions. In turn, behavioural intentions and PBC predict gambling behaviours and gambling problems with a low to moderate degree of accuracy. There are nevertheless some observed inconsistencies in findings between studies. Part of this variability appears to be attributable to differences in the type of behaviour under investigation (i.e., gambling participation, gambling frequency, or gambling problems), as well as differences in sample populations (i.e., young adults vs. other young people, non-problem vs. problem gamblers). These findings also suggest that there is a substantial proportion of the variance in gambling intentions and behaviours that remains unexplained. While some of the unexplained variance is likely attributable to methodological factors (i.e., measurement error), consideration of other conceptual variables in the TPB is clearly warranted. Indeed, Ajzen (1991) suggested that the TPB is open to the

inclusion of additional constructs if it can be demonstrated that "they capture a significant proportion of variance in intentions and behaviour after the theory's current variables have been taken into account" (p. 199). This has prompted several researchers to examine the role of anticipated emotional reactions in behavioural intentions and actual behaviour.

Affective Forecasting and Anticipated Emotions

A criticism of the TPB model acknowledged in the literature is the framework's strict focus on cognitive processes. Researchers have suggested that viewing decision-making for different types of risk-taking behaviours as a similar, rational process overlooks several key elements of risky behaviour (Gibbons et al., 2009). One element largely ignored by the TPB is the impact of emotions or anticipated affective reactions on decision processes (Gibbons et al., 2009; Richard et al., 1998; van der Pligt & de Vries, 1998). This has been proposed as a potential shortcoming of the theory, particularly given evidence to suggest that anticipated affective reactions to the performance or non-performance of specific actions can influence behavioural decision-making (Hershey & Baron, 1987; Josephs, Larrick, Steele, & Nisbett, 1992; Simonson, 1992).

Affective forecasting involves the prediction of emotional responses to future outcomes or events, and it is these judgements of anticipated emotions that guide the individual's decision-making, including decisions to engage in preventive or health-compromising behaviours (Chapman & Coups, 2006; Mellers & McGraw, 2001; Wilson & Gilbert, 2003). Also referred to as anticipatory emotions, affective forecasts implicate predictions about four components of emotional experiences: a) valence (i.e., how positive or negative); b) specific type (e.g., pleasure, pride, guilt, regret); c) intensity; and d) duration (MacInnis & Patrick, 2006; Wilson & Gilbert, 2003). Although individuals can be accurate or inaccurate in their prediction of each of these

components of emotional experience (Buehler & McFarland, 2001; Gilbert & Ebert, 2002; Wilson & Gilbert, 2005), anticipatory reactions are proposed to play an important role in motivating and directing future behaviour (MacInnis & Patrick, 2006).

Negative anticipatory emotions (i.e., regret, guilt), in particular, are presumed to influence participation in high-risk or potentially addictive activities. Individuals are assumed to be motivated to avoid negative post-behavioural feelings, and consequently tend to make decisions that they anticipate will minimize the potential of experiencing subsequent negative emotions (Sandberg & Conner, 2008). However, despite the popular underlying assumption that emotional states arouse and drive behaviour, NAE are not assumed to have a direct influence on the enactment of behaviour (Baumeister, Vohs, DeWall, & Zhang, 2007). Rather, the theoretical literature seems to suggest that, under conditions of risk, NAE influence behavioural decision-making processes towards the gathering of relevant data to make informed choices, the selection of goals to attain, and the selection actions needed to attain the chosen goal (i.e., selection of behavioural intentions) (Bagozzi, Dholakia, & Basuroy, 2003; Baumeister et al., 2007; Taylor, 2007).

Over the past two decades, a growing body of research has examined the role of NAE, especially anticipated regret, in the context of the TPB (Conner, Sandberg, McMillan, & Higgins, 2006; Parker, Manstead, & Stradling, 1995; Richard et al., 1998; Richard, van der Pligt, & de Vries, 1996; Sheeran & Orbell, 1999). Several studies have demonstrated that NAE can add to the prediction of behavioural intentions over and above the components of the TPB for a multitude of risk activities, including drug and alcohol consumption (Richard et al., 1996), commission of driving offenses (Parker et al., 1995), and smoking initiation (Conner et al., 2006). Factor analytic studies (Richard et al., 1996; Sheeran & Orbell, 1999) examining whether

NAE represent a distinct construct from attitudes have found NAE to represent a singular construct that is differentiated from attitudes and subjective norms, with only moderate correlations observed between these variables. Meta-analytic reviews (Rivis, Sheeran, & Armitage, 2009; Sandberg & Conner, 2008) have provided further supportive evidence for the predictive validity of anticipated regret after controlling for the components of the TPB, as well as for its discriminant validity.

In addition to their additive effects, NAE is assumed to act a moderator in the relationship between behavioural intentions and actual behaviour. Sheeran and Orbell (1999) speculated that high levels of NAE would likely bind individuals to their intentions and therefore strengthen their intentions since a failure to act would be associated with aversive affect. Thus, NAE is proposed not only to strengthen intentions, but also to increase the likelihood that intentions will be acted on. A small number of studies have demonstrated a moderating effect of NAE on intention-behaviour relations for binge-drinking (Cooke, Sniehotta, & Schüz, 2007), and smoking behaviour (Conner et al., 2006). The implications of these findings is that an increase in the salience or strength of NAE may be a valuable method for modifying people's intentions to perform a behaviour or for helping individuals act on their behavioural intentions (Sandberg & Conner, 2009).

While the role of NAE in the prediction of behavioural intentions and action has been demonstrated for high-risk behaviours, the contribution of NAE in the context of gambling has been relatively neglected, despite considerable research evidence to suggest that gambling behaviour is susceptible to motivational, cognitive and decision-making biases (Clark, 2010; Delfabbro, Lambos, King, & Puglies, 2009; Toplak, Liu, Macpherson, Toneatto, & Stanovich, 2007; van Holst, van den Brink, Veltman, & Goudriaan, 2010). Findings from the small body of

extant research provide support for the significance of anticipated negative emotions in gambling decision-making and intentions (Li et al., 2010; Risen & Gilovich, 2007; Wolfson & Briggs, 2002). Specifically, in a series of studies, Risen and Gilovich (2007) found that anticipation of regret from relinquishing a winning lottery ticket does influence college students' decisions of whether to exchange lottery tickets. Additionally, in their assessment of the intentions of 485 lottery players to participate in a new midweek lottery draw in the United Kingdom one week prior to its introduction, Wolfson and Briggs (2002) found that 55% of lottery players intended to purchase a ticket for the new midweek draw because they anticipated feeling upset if the numbers they play on weekends were drawn and they didn't have a ticket, and that 38% of lottery players intended to purchase a ticket because they anticipated feeling regret from missing out on a possible win. Moreover, Li et al. (2010) observed that anticipation of regret negatively predicted college students' intentions to gamble, with anticipated regret explaining 6.2% of the variance in intentions.

Results from other studies further demonstrate the importance NAE in the prediction of intentions to initiate or continue gambling participation over and above the effects of other proximal determinants of behaviour, such as attitudes and subjective norms (Sheeran & Orbell, 1999; Zeelenberg & Pieters, 2004). In a series of studies, Sheeran and Orbell (1999) investigated whether the addition of anticipatory regret would add significantly to the prediction of intentions to play the lottery for general population and university student convenience samples after accounting for the components of the TPB. Their results indicated that participants' anticipation of experiencing feelings of regret should they not play the lottery was the best predictor of intentions to play the lottery, and that anticipatory regret contributed substantial variance to intentions to play over and above the variance explained by attitudes, subjective norms, and

PBC. In a subsequent study, Zeelenberg and Pieters (2004) assessed the attitudes, subjective norms, anticipation of regret, and the behavioural intentions for future lottery play from a representative sample of 400 Dutch lottery gamblers. Hierarchical regression analyses revealed that while both attitudes and anticipatory regret were predictive of behavioural intentions to continue participation in lottery play, the addition of anticipated regret in the model increased the amount of variance explained in intentions to play.

Taken together, findings from previous research reveal the importance of anticipated negative emotions in gambling decision-making and gambling intentions. Nevertheless, the predictive utility of NAE in the avoidance of excessive gambling behaviour remains unclear.

The TPB in Adolescent Behaviour Change Interventions

The TPB suggests that manipulations to attitudes, subjective norms, and control perceptions could potentially produce long-term changes in future intentions and behaviour (Fishbein & Ajzen, 2010). Montaño and Kasprzyk (2008) propose that for theory to adequately drive intervention, it must provide a framework for the selection of salient factors that can be influenced from among the many possible factors associated with the behaviour, and they suggest that the TPB is particularly useful in this regard. Consequently, interest in the utility of the TPB model for adolescent behavioural change interventions has increased over the past few years.

Currently in the literature, there exist a number of studies that have applied the TPB to the development of preventive interventions aimed at modifying beliefs, intentions, and behaviours for several adolescent risk activities, or in the evaluation of these interventions. Targeted adolescent risk activities have included general risk-taking (Buckley, Sheehan, & Shochet, 2010; Chapman, Buckley, & Sheehan, 2012), unsafe driving (Poulter & McKenna,

2010; Sheehan et al., 1996) and risky sexual practices (Hill & Abraham, 2008; Jemmott, Jemmott, Braverman, & Fong, 2005; Jemmott, Jemmott, Fong, & McCaffree, 1999). However, the theory has been relatively neglected in the field of addiction (Webb et al., 2010). In one study, Cuijpers, Jonkers, De Weerdt, and De Jong (2002) evaluated a TPB-based prevention program designed to target secondary school students attitudes, social norms, and self-efficacy with respect to tobacco, alcohol, and cannabis use. Their results revealed a significant decrease in the proportion of students reporting daily tobacco use and weekly alcohol use for the intervention group but not the control group at 3-year follow-up. Guo, Lee, Liao, and Huang (2015) also evaluated the efficacy of a TPB-based substance-use preventive education program on enhancing students' behaviour intentions to abstain from illicit drug use and reducing their actual illicit drug use. They observed that students who received the prevention program demonstrated greater changes in their substance-related attitudes, subjective norms, PBC, and intentions over time than those that received no intervention. Guo et al. also found that, compared to the control group, a significantly smaller proportion of participants in the TPB-based intervention group reported illicit drug use six months and one year following program delivery. These preliminary findings have prompted researchers to advocate for increased recognition of the value behaviour change theories such as the TPB in the development of interventions for addictive behaviours (Webb et al., 2010).

Strengths and Limitations of the TPB in Prevention Practice

From the extant empirical literature, the TPB remains a viable framework for the development of behaviour change interventions, with research results indicating that the application of the model to behavioural interventions produces moderate changes in beliefs, intentions, and behaviours for youth risk activities and addictive behaviours. Fundamentally, the

planned behaviour model is useful in intervention design because it provides important information about the primary beliefs that influence intentions to perform or not perform the behaviour under consideration, and therefore allows for the selection of appropriate targets for intervention.

Additionally, the TPB is proposed to offer advantages over other cognitive and/or behaviour change models. For one, the TPB can be applied to situations where individuals may lack the intention to change or where their actual level of intention is unknown, situations that are common in the practice of primary prevention (Romano & Netland, 2008). Adolescents are frequently reported to fail to actively seek to change their problematic gambling behaviour for multiple reasons, including the belief that that they can control their behaviour, as well as adolescent self-perceptions of invincibility and invulnerability (Gupta & Derevensky, 2004; Hardoon, Derevensky, & Gupta, 2003). Additionally, problem gambling interventions have been criticized in the literature for their insufficient attention to the motivational factors that drive the behaviour (Wulfert, Blanchard, & Martell, 2003). Because the TPB emphasizes the determinants of behavioural intentions, which leads to a better understanding of the factors related to behaviour change, the strength of the model when applied to prevention interventions is that prevention activities can be designed for individuals or groups ambivalent about or not motivated to change, including adolescents ambivalent or unmotivated to change gambling behaviours.

Further, in comparison to other change models, the TPB has a well-defined procedure for developing preventive interventions. The development of behaviour change interventions using the TPB involves the identification of salient attitudes, perceived norms, control perceptions and intentions that adequately explain the variance in the behaviour of interest (Fishbein & Ajzen, 2010). This is achieved through qualitative and quantitative empirical research, called *elicitation*

research, using samples that are representative of the population under consideration. Elicitation research is critical for the development of effective interventions since it would be counter-productive to target variables that do not account for a significant proportion of variance in behavioural intentions or behaviour (Conner & Sparks, 2005), and allows the researcher or practitioner to draw out the most culturally relevant variables of the group targeted for intervention (Romano & Netland, 2008). TPB elicitation research also allows for the identification of subtle or important differences between those who engage in the behaviour and those who do not, and this information can inform the content of the preventive intervention for each group. Much of the necessary elicitation research has already been conducted and is described within the extant literature for adolescent gambling behaviours (see Derevensky, 2012; Shead et al., 2010; and Volberg et al., 2010 for a review of previously identified risk and protective factors).

Although the procedure for designing interventions based on the planned behaviour framework is well-described, it is imperative to note that the model does not specify the strategies or techniques to be used to elicit changes in the target behaviour; the selection of intervention strategies remain at the discretion of each individual investigator, depending on the nature of the behaviour and population, and on the available resources (Fishbein & Ajzen, 2010; Webb et al., 2010). The TPB can therefore be considered more as a valuable framework for the identification of "cognitive targets for change" than as a model providing explicit guidelines on "how these cognitions might be changed" (Hardeman et al., 2002, p. 149). One proposed solution is to draw upon other theoretical frameworks and research identifying effective tools for changing behavioural determinants (Webb et al., 2010). While this approach remains in its infancy, certain techniques have been identified as appropriate for changing specific TPB

behavioural determinants, including attitudes, subjective norms, perceptions of behavioural control, and intentions (see Abraham & Michie, 2008; Hardeman et al., 2005; Michie, Johnston, Francis, Hardeman, & Eccles, 2008). A list and brief description of a subset of techniques that may be relevant to adolescent problem gambling prevention is provided in Table 2.2. In addition to these techniques, narrative communication is another technique for motivating and supporting behaviour change that has been identified (Hinyard & Kreuter, 2007; Petraglia, 2007).

Narrative Communication in Behaviour Change Interventions

A narrative refers to any representation of a sequence of events, characters, and consequences, which has an identifiable structure and that contains implicit messages about the topic under consideration but does not explicitly present and defend issue-relevant arguments (Dunlop, Wakefield, & Kashima, 2010; Kreuter et al., 2007). Narrative communication is therefore characteristically different from traditional expository or advocacy persuasive messages (Dunlop et al., 2010), and can take a range of forms, including official stories regarding events, firsthand experiential stories or testimonials, and invented stories that accurate information (Hinyard & Kreuter, 2007).

The basic premise behind the utility of narrative communication in behaviour change is that individuals will be persuaded by information or messages conveyed into a narrative as they become "transported". Transportation consists of being actively engaged with the storyline, rather than with the immediate environment, and experiencing vicarious cognitive and affective responses to the narrative as it develops (Moyer-Gusé, 2008). It is important to note that transportation is distinguished from personal relevance or involvement; whereas involvement is described as a motivational state in which an individual recognizes the personal relevance of an overtly persuasive message, transportation is an experiential state in which an individual feels

Table 2.2

Intervention Techniques for Changing TPB Behavioural Determinants (Abstracted from Abraham & Michie, 2008; Hardeman et al., 2005; Michie et al., 2008).

TPB behavioural determinant	Technique	Description
1. Attitudes towards behaviour	a. Provide information regarding the desired behaviour and outcomes	i. Deliver information about the antecedents, costs, and benefits of performing the desired behaviour, as well as the connections between antecedents and consequences.
	b. Persuasive communication	ii. Explicitly present and defend arguments in favour of the desired behaviour via credible sources.
2. Subjective norms regarding behaviour	c. Provide information about others' approval	iii. Deliver information about what non-expert others think about the behaviour and whether they would approve or disapprove of any proposed change in behaviour.
	d. Modeling or demonstration of behaviour by others	iv. Provide opportunities for observing non-expert others performing the desired behaviour (e.g., during group learning, using a video, via a case study).
3. Perceived control over the behaviour / self-efficacy	e. Prompt self-monitoring of behaviour	v. Require the individual to track and record performance of specified behaviour(s) (e.g., in a diary).
	f. Provide feedback regarding behaviour	vi. Provide data regarding recorded or self-monitored behaviour, and/or evaluate performance of behaviour in relation to a set of standards or others' performance.
	g. Prompt self-talk	vii. Encourage the use of self-instruction or planned self-statements (aloud or silently) to support implementation of desired behaviour.
	h. Prompt practice or rehearsal	viii. Encourage the rehearsal and repetition of desired behaviour.
4. Intentions to perform the behaviour	i. Prompt intention formation	ix. Encourage decisions regarding actions or the setting of a general goal (e.g., make a behavioural resolution to not gamble beyond limits).
	j. Increase decision-making and problem-solving skills	x. Prompt for the detailed planning of performance of desired behaviour or goal setting, as well as prompt for identification of alternative courses of actions and weigh the pros and cons of each.
	k. Motivational interviewing	xi. Elicit self-motivating statements and evaluations of own behaviour to minimize resistance to behavioural change.

caught up in the narrative itself and not in any issues or consequences extrinsic to the story (Dunlop et al., 2010).

The psychological process of transportation ultimately leads to changes in beliefs, intentions and behaviours by lowering resistance to persuasive appeals, reducing counter-arguing, enhancing perceptions of group and/or personal susceptibility through identification with the characters of the narrative, and allowing for individuals to engage in mental simulations of performing novel behaviours (Green, 2006; Hinyard & Kreuter, 2007). A number of mediating factors are proposed to influence the experience of transportation. These include perceived realism of the narrative (i.e., extent to which the contents of a story seem plausible and representative), pre-existing similarity between the story's character and the receiver (reader, listener, viewer) of a narrative, recipients' personal experiences related to the events conveyed in a narrative, and imagery in the narrative that is relevant to the central message being conveyed (Green, 2006; Green & Brock, 2002; Hinyard & Kreuter, 2007).

An increasing number of research projects have utilized narrative communication in educational interventions targeting adolescent risk and addictive behaviours with positive results (Poulter & McKenna, 2010; van Leeuwen, Renes, & Leeuwis, 2013; Warren et al., 2006). Despite this growing trend, only two empirical evaluations of youth gambling prevention initiatives, which incorporated narrative communication as one of several techniques for promoting changes in gambling-related beliefs and behaviours, have been published to date (Turner, Macdonald, Bartoshuk et al., 2008; Turner, Macdonald, & Somerset, 2008). The content of these interventions included (among other elements) brief skits designed to illustrate how adolescents can become overly involved in gambling resulting from emotional distress, early wins, or erroneous beliefs about gambling. Evaluation of these interventions revealed statistically

significant improvement in students' knowledge of gambling, as well as their coping, applied decision-making and problem-solving skills. However, evaluation of these programs also revealed no significant effects on students' gambling attitudes, involvement, or problematic behaviours. Nevertheless, given the focus and diverse content of these two adolescent gambling educational interventions, firm conclusions about the impact narrative communication in eliciting changes in students' gambling intentions and actual behaviour cannot be drawn. Additional empirical evaluation of the effectiveness of narrative communication in preventive or behaviour change interventions for adolescent problem gambling is therefore needed.

Clean Break: A Narrative-Based Preventive Intervention

The International Centre for Youth Gambling Problems and High-Risk Behaviors' *Clean Break* (2006) docudrama DVD is a narrative communication intervention explicitly developed to increase adolescents' awareness and understanding of problem gambling. The 25-minute docudrama (i.e., documentary-style film featuring dramatized re-enactments) is principally structured around the testimony of a problem gambler, who describes his various personal experiences with gambling (e.g., initiation to gambling, progression to over-involvement in gambling, impact of over-involvement on functioning and health). In addition to the testimonial, dramatic scenarios depicting realistic situations faced by adolescents who become over-involved with gambling feature prominently in the video-based intervention. The scenarios portray the consequences of the characters' problematic gambling behaviour on their relationships with others, as well as on their own psychological and emotional health.

Throughout the docudrama, certain common beliefs and misconceptions about gambling are challenged, such as "gambling with friends is a harmless form of entertainment for teens", "gambling is only a problem if you always lose money", "an individual is in control of the

outcome of his or her gambling", and "most friends/family members think it's acceptable to gamble". It is important to note that the scenarios are not designed to convey a message that gambling should be abstained from, but rather to sensitize high-school students to the potential risks, warning signs, and consequences associated with excessive gambling.

The docudrama format of the *Clean Break* prevention video was selected for several reasons. For one, research suggests that the structure or format of a preventive intervention is equally important as the educational content, especially for adolescent populations (Williams et al., 2010). A medium that is engaging and that can capture students' attention and interest is essential for a preventive intervention's effectiveness (Ferland et al., 2002). The use of scenarios requiring viewers to formulate assumptions and use deductive reasoning for understanding the storyline is hypothesized to heighten students' engagement. Additionally, the use of narratives can contribute to: a) lowering students' resistance to persuasive messages and reducing counter-arguing; b) enhancing perceptions of personal susceptibility through identification with the characters; and c) facilitating observational learning. Further, given that narratives present emotionally powerful information, it is assumed that dramatic depictions of the negative emotional consequences associated with a gambling behaviour is likely to enhance students' anticipation of the emotional consequences of their own behaviour.

The *Clean Break* preventive intervention was developed based on qualitative and quantitative empirical research using representative samples of adolescents. Selection of the primary beliefs to be targeted in the video stemmed from previous empirical research identifying beliefs and cognitions that are predictive of adolescent gambling intentions and behaviours, as well as from professional expertise in the treatment of youth gambling problems. Focus group testing with high-risk and normative samples of adolescents was also conducted throughout the

construction of the video, with results indicating that the docudrama format encourages adolescents to develop an emotional connection to the characters, that the format is appealing, and that the video meets their expectations. While the results from formative research provides preliminary evidence for the appeal and appropriateness of this prevention resource for high-risk and general adolescent populations, the video's effectiveness in producing sustained changes in adolescent gambling intentions and behaviour has not yet been established.

Aims of the Current Research Program

While few published evaluations of school-based prevention initiatives targeting youth gambling currently exist, the prevention programs that have been systematically assessed have often failed to produce significant and sustained changes in gambling behaviour. These youth problem gambling prevention programs have generally targeted increasing knowledge about gambling and problem gambling and reducing erroneous cognitions. Certain of the more comprehensive programs have also targeted the development of adolescent decision-making, problem-solving, emotional regulation and self-control skills. Given this situation, an important question comes to the forefront: what are the key predictors of adolescent gambling behaviour that should be targeted in preventive interventions in order to elicit persistent changes in the target behaviour?

A small but growing number of studies have identified anticipation of negative emotions and several TPB variables (i.e., attitudes, family and peer subjective norms, perceptions of behavioural control, intentions) as valid predictors of gambling participation, gambling frequency, and gambling problems (e.g., Martin et al., 2010; Moore & Ohtsuka, 1997, 1999; Wu & Tang, 2012). These findings suggest that efforts aimed at promoting responsible gambling decision-making or preventing the development of problem gambling should consider these

psychological constructs as targets for intervention. However, no available research has investigated the validity of an extended TPB model, which includes NAE, as it applies specifically to adolescent gambling. Additionally, while there is preliminary evidence of the value of the TPB in the development of interventions for addictive behaviours (e.g., Cuijpers et al., 2002; Guo et al., 2015), no studies have explored the suitability of an extended TPB model for the elaboration or evaluation of school-based problem gambling prevention initiatives. The primary objectives of the current program of research are to extend the literature exploring this conceptualization of gambling decision-making and behaviour, and to understand how an extended TPB may better inform the design of adolescent problem gambling preventive initiatives.

To address these goals, this program of research is presented via two studies of an extended TPB model in the context of adolescent gambling that are distinct in their objectives and methodologies. Each of these manuscripts contributes to the validation of the framework with adolescent high school students. Manuscript 1 assesses the direct and indirect effects of NAE and the TPB's critical components for the frequency of adolescent gambling behaviour and for gambling-related problems. This study lays the groundwork for the second study (Manuscript 2), which examined the efficacy of a universal, narrative communication prevention tool for eliciting changes in the psychological correlates of adolescent gambling behaviour and problems identified in Manuscript 1. The combined results from this program of research provide new evidence for the validity of an extended TPB for understanding adolescent gambling and for developing school-based problem gambling prevention programs.

CHAPTER III

MANUSCRIPT 1

Adolescent Gambling and Problem Gambling: Examination of an Extended Theory of Planned Behaviour[1]

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Abstract

Adolescent problem gambling is acknowledged as a public health concern. To better understand adolescent gambling and problem gambling behaviour, the present study investigated the relationships between psychological correlates of gambling frequency and problem gambling using an extended theory of planned behaviour (TPB) (i.e., intentions, attitudes, subjective norms, perceptions of behavioural control) that includes negative anticipated emotions as a factor associated with gambling intentions. Four hundred and nineteen high school students were surveyed in the Montreal (Canada) region. The findings generally support the applicability of an extended TPB model for explaining gambling behaviour frequency and gambling problems among adolescents. The results reveal that negative anticipated emotions, attitudes, and perceptions of behavioural control influence gambling intentions. The results further reveal that intentions and attitudes have a direct relationship with gambling frequency, while intentions and perceptions of behavioural control are directly related to problem gambling behaviours. These findings suggest that adolescent problem gambling prevention and intervention efforts should consider targeting negative anticipated emotions and other TPB components in order to postpone initiation to gambling (a risk factor for problem gambling) and to promote enhanced gambling decision-making.

Adolescent Gambling and Problem Gambling: Examination of an Extended Theory of Planned Behaviour

Introduction

Adolescent problem gambling is acknowledged as a public health concern (Dickson-Gillespie, Rugle, Rosenthal, & Fong, 2008; Korn, 2000; Messerlian, Derevensky, & Gupta, 2005). Findings from prevalence studies conducted worldwide reveal that a small but meaningful percentage of young people gamble excessively and experience significant gambling-related harm (Temcheff, St-Pierre, & Derevensky, 2013). Despite a lack of consensus as to the actual prevalence of severe gambling problems resulting from jurisdictional differences and the use of diverse survey methodologies and instruments, available research spanning from the early 1980s to the late 2000s does suggest that approximately 0.9–8.1% of adolescents, internationally, meet *DSM-IV* diagnostic criteria for pathological gambling (Volberg, Gupta, Griffiths, Ólason, & Delfabbro, 2010). It is important to note that assessment of the prevalence of pathological gambling differs between adolescents and adults in terms of measurement instruments and cut-off criteria used, which makes comparisons somewhat challenging.[2] Nevertheless, these prevalence estimates are disquieting since they appear, at face value, to be roughly equivalent to prevalence rates found in the general adult population (which are established to be between 0.4–4.7%; Stucki & Rihs-Middel, 2007).

In addition to relatively comparable prevalence rates, also of concern is that adolescent gambling problems are found to be associated with greater frequency of play and greater

[2] See Blinn-Pike, Worthy, and Jonkman (2010), Stinchfield (2010), and Volberg et al. (2010) for a more thorough discussion of methodological issues and concerns regarding the assessment of problem or pathological gambling among youth.

gambling expenditure, as well as serious concomitant and subsequent health, psychological, legal, and social problems. Specifically, significant positive associations have been found between gambling frequency and problem gambling symptoms in adolescents, with gambling expenditures observed to increase proportionally with degree of gambling-related problems (Hansen & Rossow, 2008). In addition, gambling problems in adolescents have been shown to be concomitant with academic difficulties, poor or disrupted family relationships, alcohol and substance use problems, delinquency, mental health issues, and suicidality (Cook et al., 2014; Shead, Derevensky, & Gupta, 2010; Volberg et al., 2010). Gambling problems amongst young people are further observed to be prospectively associated with depression (Dussault, Brendgen, Vitaro, Wanner, & Tremblay, 2011) and criminal behaviour (Wanner, Vitaro, Carbonneau, & Tremblay, 2009) in early adulthood.

While the prevalence of gambling problems among adolescents has been widely examined over the past three decades, the reasons these young people choose to gamble or gamble excessively are not entirely understood. A growing body of empirical research has identified several different predictors and correlates of adolescent gambling and problem gambling behaviour. These include demographic (e.g., gender, age), cognitive (e.g., cognitive biases, positive gambling outcome expectancies), attitudinal (e.g., positive gambling attitudes), and social (e.g., parental gambling behaviours, peer involvement in gambling and other high-risk behaviours) factors (Delfabbro & Thrupp, 2003; Gillespie, Derevensky, & Gupta, 2007; Shead et al., 2010; Tang & Wu, 2012; Temcheff et al., 2013). However, few studies with adolescent populations have taken into account the possible connections among the predictors (Lee, 2013), with the exception of the ‘Pathways Model’ (see Gupta, Nower, Derevensky, Blaszczynski, Faregh, & Temcheff, 2013). As Blaszczynski and Nower (2002) suggest, advances in the

understanding of pathological gambling or gambling disorder[3] are dependent upon the development of comprehensive models of gambling behaviour. Research investigating the explanatory value of different comprehensive models of gambling behaviour will therefore be crucial for gaining a more complete understanding of the reasons for adolescent initiation of gambling and excessive play behaviour, which could in turn serve to guide future prevention and intervention efforts.

The theory of planned behaviour (TPB; Ajzen, 1991, 2002) is one social cognition model that has attracted attention from psychologists and researchers attempting to conceptualize the links between established predictors for a range of youth health behaviours (e.g., contraceptive use, smoking, drug use, and alcohol consumption). It has also been proposed as a potentially useful model for explaining the decision to gamble or the selection of a specific gambling activity (Cummings & Corney, 1987). The TPB asserts that the execution of any behaviour is determined by the individual's intention to engage in the behaviour. Behavioural intentions represent a person's motivation to exert effort in performing a specific behaviour. The theory further postulates that behavioural intentions are themselves influenced by three independent factors: attitudes, subjective norms, and perceptions of control. Attitudes consist of the individual's overall positive or negative evaluations of the behaviour. Subjective norms are the individual's perceptions of important others' appraisals of the behaviour. Perceptions of control, or perceived behavioural control (PBC), represent the individual's expectations about the facility or difficulty in executing the behaviour. Perceptions of control are also proposed to have a direct

[3] The terminology used to describe gambling problems has changed over time. The current DSM-5 term is "gambling disorder" (see American Psychiatric Association, 2013 for a detailed description).

impact on behaviour when these perceptions are accurate or realistic, since they reflect the actual level of control an individual has in the performance of a specific behaviour (Ajzen, 2002).

The explanatory value of the TPB model for young adult gambling and disordered gambling behaviour has received some empirical support (Martin, Nelson, Usdan, & Turner, 2011; Martin et al., 2010; Wu & Tang, 2012). Martin et al. (2010) investigated the predictive relationships between the TBP components (i.e., attitudes, subjective norms, PBC, intentions) and past-year gambling participation, as well as the frequency of participation. They observed that gambling-related attitudes, subjective norms, and PBC were predictive of the frequency of gambling. Martin et al. also found that intention to gamble partially or fully mediated the relationships between gambling frequency and the other TPB components (i.e., attitudes, subjective norms, PBC).

Consistent with Martin et al. (2010), Wu and Tang (2012) observed that positive gambling attitudes, positive subjective norms regarding gambling, and a low sense of control over gambling refusal were predictive of Chinese college students' intentions to gamble. They also indicated that gambling intentions and PBC had direct predictive effects on problem gambling behaviour, and that gambling intentions mediated the positive effects of attitudes and subjective norms on problem gambling behaviour.

It is of interest that Martin et al. (2011) observed differences in the explanatory value of the TPB for young adult gambling behaviour between problem and non-problem gamblers. Specifically, they found that for non-problem college student gamblers, attitudes, subjective norms, and PBC were predictive of gambling frequency, and that intention to gamble mediated the relationship between gambling frequency and the other TPB constructs. Conversely, for student problem gamblers, none of the TPB components were predictive of gambling intention.

Rather, it was found that gambling-related attitudes independently predicted gambling frequency among problem gamblers.

To date, only one published study has explored the relationships between certain TPB components and gambling behaviour among younger adolescents. Drawing from a sample of 757 secondary school and 250 university students (aged 14–25 years) in Australia, Moore and Ohtsuka (1997) found that intentions to gamble were significantly, but modestly, associated with gambling-related attitudes and subjective norms, accounting for 13–15% of the explained variance in gambling intentions. Additionally, they observed that gambling frequency (24–26% of explained variance) and problem gambling (24–36% of explained variance) was predicted most strongly by intentions, and that attitudes predicted gambling frequency both directly and indirectly through intentions. Attitudes, however, were not found to make an independent contribution to problem gambling over and above the contribution to intentions. It should be noted that PBC was not included as a factor in the model, that several other cognitive and personality variables (e.g., cognitive biases about winning and losing, impulsiveness) were tested in the model along with the TPB variables, and that adolescents and young adults were grouped together. Given the study's methodology, it remains unclear from Moore and Ohtsuka's findings what the explanatory value of the full TPB model (which includes PBC) would be for gambling behaviours strictly among adolescent populations, and whether the explanatory value of the TPB would be comparable for adolescent versus young adult gambling behaviour.

Limitations of the TPB Model

One acknowledged criticism of the TPB model is the framework's failure to take into account emotional processes (Richard, de Vries, & van der Pligt, 1998; van der Pligt & de Vries, 1998), especially given evidence to suggest that anticipated affective reactions are an important

factor in health-related decision-making and action (Josephs, Larrick, Steele, & Nisbett, 1992; Simonson, 1992). Negative anticipated emotions (NAE), such as regret and guilt, are presumed to particularly influence participation in high-risk or addictive activities. In general, individuals are driven to avoid negative post-behavioural affect; therefore, they will be inclined to select behaviours that are perceived to curtail the possibility of experiencing later negative emotions (Sandberg & Conner, 2008). However, despite the popular underlying assumption that emotional states arouse and drive behaviour, NAE are not assumed to have a direct influence on the enactment of behaviour (Baumeister, Vohs, DeWall, & Zhang, 2007). Rather, the theoretical literature seems to suggest that, under conditions of risk, NAE influence behavioural decision-making processes towards the gathering of relevant data to make informed choices, the selection of goals to attain, and the selection actions needed to attain the chosen goal (i.e., selection of behavioural intentions) (Bagozzi, Dholakia, & Basuroy, 2003; Baumeister et al., 2007).

Findings from empirical studies with adults provide support for the significance of NAE in gambling decision-making and intentions (Li et al., 2010; Risen & Gilovich, 2007; Wolfson & Briggs, 2002). Results from other studies conducted with adults further demonstrate the importance NAE in the prediction of intentions to initiate or intentions to continue gambling participation over and above the effects of other TPB components, such as attitudes and subjective norms (Sheeran & Orbell, 1999; Zeelenberg & Pieters, 2004). While this body of research reveals the importance of anticipated negative emotions in gambling decision-making and gambling intentions, the utility of NAE in explaining actual gambling behaviour remains unclear.

Research Goals and Hypotheses

The current study expands on previous work by Martin et al. (2010), Moore and Ohtsuka (1997), and Wu and Tang (2012), and explores the value of an extended TPB model for explaining adolescent gambling behaviour. Specifically, this study sought to ascertain whether gambling-related attitudes, subjective norms, PBC, NAE, and intentions are associated with gambling frequency (past 3 months) and problem gambling (past year) among adolescents.

Based on the framework proposed by Ajzen (1991, 2002), and given empirical evidence from Martin et al. (2010), Moore and Ohtsuka (1997), Wu and Tang (2012), and Zeelenberg and Pieters (2004), it was hypothesized that: (1) attitudes towards gambling would have positive indirect effects (via gambling intentions) on gambling frequency and gambling problems; (2) attitudes towards gambling would also have positive direct effects on gambling frequency but not gambling problems; (3) perceptions of control over refusal to gamble would have negative indirect effects (via gambling intentions) on gambling frequency and negative direct effects on problem gambling; (4) family and peer subjective norms would have a positive indirect effect (via gambling intentions) on gambling frequency and problem gambling; (5) NAE would be indirectly related to gambling frequency and problem gambling via their negative relationship with gambling intentions; and (6) intentions to gamble would be positively related to gambling frequency and problem gambling. These hypotheses are illustrated in Figure 3.1.

Method

Participants

The current study was part of a larger project designed to evaluate and compare the effectiveness of youth gambling prevention tools. The sample comprised 419 adolescents (229 males; 189 females, 1 unreported gender) from grades 9, 10, and 11 in three secondary schools in

the greater Montreal (Canada) area. Two additional participants were excluded from the final sample due to insincere responding (e.g., inconsistent responses, endorsement of gambling on a fictitious gambling activity). Participants were 14 to 17 years of age (M = 15.60 years, SD = 0.92). The majority of the sample (n = 321, 76.6%) comprised students enrolled in the public school system. Approximately one fifth of participants were in grade 9 (n = 76, 18.1%), one third were in grade 10 (n = 157, 37.6%), and about half were in grade 11 (n = 185, 44.3%).

Measures

With the exception of items to measure NAE, all scales utilized for the purposes of this study were selected based on their use in prior research examining the applicability of the TPB to gambling behaviour (i.e., Martin et al., 2010, 2011; Moore & Ohtsuka, 1997; Wu & Tang, 2012), and given their appropriate use with adolescent populations and adequate psychometric properties (i.e., Fisher, 2000; Moore & Ohtsuka, 1997; Tremblay, Stinchfield, Wiebe, & Wynne, 2010).

Gambling Attitudes Scale (GAS; Moore & Ohtsuka, 1997). The GAS is a 12-item measure assessing respondents' attitudes towards gambling and its consequences. Each item is rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Sample items include "Gambling is a fun activity" and "Gambling destroys families". Items were summed to produce a scale score ranging between 12–60, with higher scores representing more positive attitudes towards gambling. The internal consistency was good within this sample (Cronbach's alpha = 0.83), with an average correlation between items of r = .29.

Gambling Injunctive Norms Scale (GINS; Moore & Ohtsuka, 1997). The GINS is a 12-item scale used to assess perceived family and peer norms respecting gambling on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Sample items include "My family

approves of gambling" and "Most of my friends gamble sometimes". Two additional items are included to measure motivation to comply with family or peers (i.e., "Generally I try to fit in with what my friends want" and "Generally I try to fit in with what my family wants"). Items on this scale were revised to be appropriate for a Canadian adolescent sample (e.g., "pokies" renamed as "slot machines or video lottery terminals"). Each normative belief item is multiplied by the motivation to comply with the intended referent, with derived scores being summed together to produce a single subjective norms scale score. Scores on this scale range from 12–300, with higher scores representing perceptions of more positive social norms towards gambling. In the present study, the internal consistency of the GINS was high (Cronbach's alpha = 0.90), with an average correlation between items of r = .45.

Perceived Control over Gambling Refusal Scale (Wu & Tang, 2012). This 10-item measure was used to assess perceived behavioural control over resisting gambling under various conditions. Participants rated each item on a 4-point Likert scale (1 = *strongly disagree*, 4 = *strongly agree*). Sample items include "I can control myself not to gamble if I try hard enough" and 'It is easy for me to stick to the goal of not gambling". A scale score ranging from 10–40 was obtained by summing the item responses, with higher scores representing a greater level of perceived self-control in refusing to gamble. The internal consistency of this scale was found to be high (Cronbach's alpha = 0.92), with an average correlation between items of r = .54.

Negative Anticipated Emotions for Gambling. A four-item scale measuring NAE for participating in and for becoming over-involved in gambling was adapted from other anticipated regret measures (e.g., Caron, Godin, Otis, & Lambert, 2004; Conner, Sandberg, McMillan, & Higgins, 2006). The items included: (1) "If I gambled, I would regret it afterwards" (2) "If I gambled, I would feel upset afterwards"; (3) "If I gambled, I would worry afterwards"; and (4) "I

would regret it if I gambled more money than I planned to". Participants rated each item on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). A scale score was obtained by calculating an average response to all items, with higher scores indicating more anticipated negative emotions regarding gambling involvement or over-involvement. The internal consistency of this adapted scale was good in this sample (Cronbach's alpha = 0.87), with an average correlation between items of r = .62. The test-retest reliability of the scale was also measured in a previous study using a two-way mixed-effects model of average intraclass correlation (ICC) (Temcheff, St-Pierre, Derevensky, & Gupta, 2014). The results indicated adequate test-retest reliability for the scale [ICC (3, 132) = .72, 95% CI (.61, .80)].

Gambling Intention Scale (GIS; Moore & Ohtsuka, 1997). The GIS is a seven-item measure that assesses respondents' intentions to gamble on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). A sample item is "In the next two weeks I intend to buy a lottery ticket". The scale items were revised to be appropriate for a Canadian adolescent sample (e.g., "poker machines" renamed as "slot machines or video lottery terminals"). Items were summed to produce a scale score ranging between 7–35, with higher scores representing stronger intentions to gamble. The internal consistency of this scale was good (Cronbach's alpha = 0.85), with an average correlation between items of r = .46.

Canadian Adolescent Gambling Inventory (CAGI; Tremblay et al., 2010). To determine respondents' frequency of participation, 20 items from the CAGI were administered. Items asked respondents to specify the frequency they have gambled money on a variety of gambling opportunities during the past three months using a 6-point Likert scale (0 = *not in the past three months*, 5 = *daily*). Items were summed to produce a frequency scale score ranging between 0 and 100, with higher scores representing greater frequency of gambling. The internal

consistency of this scale was acceptable (Cronbach's alpha = 0.73), with an average correlation between items of r = .12.

DSM-IV-Multiple Response-Juvenile (DSM-IV-MR-J; Fisher, 2000). The DSM-IV-MR-J is a diagnostic survey designed to measure the severity of past year problem gambling in adolescents. The instrument consists of 12 items in nine categories modeled after *DSM-IV* criteria for pathological gambling in adults. A majority of the items in the instrument provide multiple response options ('never', 'once or twice', 'sometimes', or 'often'), and these items require an endorsement above a certain level before receiving a score of 1. For the purposes of this study, the scores (0 or 1) across the nine categories (derived from the original 12 items) were summed to form a continuous measure of problem gambling, with higher score representing higher levels of perceived gambling problems. Although this instrument has previously demonstrated adequate internal consistency (Fisher, 2000), the internal consistency in this sample was poor (Cronbach's alpha = 0.52), with an average correlation between items of r = .14.

Procedure

Following approval from the ethics review committees of McGill University and Université de Sherbrooke, requests to conduct research were distributed to English school boards in the region. Administrators at two public schools and one private institution agreed to participate. Parental consent and student assent was acquired and all eligible students were informed that participation was voluntary and they could terminate participation at any time without consequence. It was also explained that responses to the questionnaires were anonymous and confidential. Prior to delivery of the prevention program, all participating students were

administered a baseline survey. The data obtained from this baseline survey were used for the present study.

Missing Data and Analysis

SPSS version 22.0 and Mplus version 5.21 (Muthén & Muthén, 1998-2009) were used to analyze the collected data. Data screening revealed that, with the exception of the CAGI, less than 5% of the sample had one or more missing responses on each of the scales. Mean substitution was therefore selected as an appropriate method for dealing with missing observations on these scales since non-random patterns of missing values will have little influence on the results when it concerns fewer than 5% of the cases (Kline, 2009), especially when the scale is unidimensional and internal consistency is strong (Osborne, 2013). Analysis of missing data patterns revealed no association between the presence of missing values on the CAGI and any of the other variables. Further, Little's missing completely at random (MCAR) test was non-significant [χ^2 (54) = 63.31; p = .18], indicating that the data on the CAGI were missing completely at random and the mechanism for 'missingness' is ignorable. Consequently, mean substitution was also used to estimate missing values on this scale. However, since the criteria for using mean substitution was that no more than 25% of values were missing on each scale for each participant, cases that remained with missing values were omitted from analyses using the pairwise deletion method, unless stated otherwise.

Descriptive analyses were conducted to explore the characteristics of respondents. A two-step approach, described by Wang and Wang (2012), was then used to test the extended TPB model for adolescent gambling. This approach consists of assessing a measurement model to determine whether measurement items adequately reflect the latent constructs of the research model, and then estimating the hypothesized structural relationships among latent constructs.

Specifically, a confirmatory factor analysis (CFA), using the full information maximum likelihood (FIML) estimation method, was first conducted to examine the factor structures of the latent variables (Klein, 2009). FIML estimation offers a superior method for dealing with missing data in structural equation models than the default listwise deletion method (Enders & Bandalos, 2001). FIML also provides more stable and robust standard errors of parameter estimates and model fit indices based on the Satorra-Bentler (S-B) Chi-square when the data violate the assumption of multivariate normality (Wang & Wang, 2012). Subsequently, structural equation modelling (SEM), using FIML estimation, was performed to evaluate the significance of both direct and indirect effects of NAE and the TPB components on gambling frequency and perceived gambling problems. This analytic method assesses how well the model accounts for the data and estimates the presumed relationships among the variables of interest.

The goodness-of-fit of the measurement and structural models with the actual data were evaluated using the S-B model Chi-square and three fit indices: the comparative fit index (CFI), the root mean squared error of approximation (RMSEA), and the standardized root mean square residual (SRMR). As a general rule of thumb, values equal or larger than .95 for the CFI, and values smaller than .08 for the RMSEA and SRMR are indicative of a good fit (Schreiber, Nora, Stage, Barlow, & King, 2006).

Results

Descriptive Analyses

Fifty percent of participants (n = 390) with complete data on gambling frequency reported having gambled money on at least one activity in the past three months. The extent of gambling behaviour on a variety of activities is shown in Table 3.1. The gambling activities most frequently participated in (i.e., about once per week or more) were self-organized, peer-related

activities: betting on performance of a dare or challenge (5.6%); betting in sports pools (4.3%); wagering on results of games of skill (3.3%); and wagering on non-casino card games (2.6%). A minority of participants also reported engaging in age-restricted forms of gambling on occasion (i.e., about once a month or more), including gambling on government-run sportsbooks (7.9%), Internet poker (7.3%), and instant-win scratchcards (7.1%). Of the participants that reported gambling in the past three months (n = 194), 91.2% did not endorse any of the symptoms associated with problem gambling, 7.4% endorsed 1-2 symptoms, and 1.4% endorsed ≥ 3 symptoms.

The means, standard deviations, and correlations between the TPB components, NAE, gambling frequency and gambling-related problems are presented in Table 3.2. These data suggest that although participants had modest intentions to gamble and anticipated substantial negative emotions resulting from gambling or becoming over-involved in gambling, they also perceived high behavioural control for resisting gambling. Further, the data reveal that participants had moderately favourable gambling attitudes, but their perceptions of family and peers' approval of gambling was modest. Finally, the data indicate that frequency of gambling and perceived levels of gambling problems were low among the current participants.

One-way analyses of variance were performed to examine the relationships of possible confounding demographic variables (i.e., gender, age) with gambling frequency and perceived gambling problems. Analyses indicated that gender and age were not significantly associated with either outcome variable. These demographic variables were therefore excluded from subsequent analyses.

Estimation of the Measurement Model

The results of the CFA indicate an acceptable fit between the measurement model and the observed data. The S-B model Chi-square statistic was significant [S-B χ^2 (883, N = 419) = 1383.76; p < .001]. The values of the three fit indices were all within the range of their suggested cut-off criterion [CFI = .95; RMSEA = .04, 90% CI = .03, .04; SRMR = .06].

A test of the convergent validity of the measurement model revealed that all indicator loadings are significant at p < .01. Factor loadings ranged from fair to excellent (Brown, 2006). Items with fair loadings were retained due to the contribution of these items to the overall theoretical models supported by the measures, and in order to maintain comparability of these measures with previous studies. Thus, the measurement model is considered to demonstrate acceptable convergent validity.

Further, a test of discriminant validity revealed that all inter-factor correlations were well below the suggested criterion (< .85; Kline, 2011). These values ranged between r = .01 (correlation between Gambling Frequency and PBC) and r = .58 (correlation between Attitudes and NAE). As such, the measurement model shows adequate discriminant validity on the sample data and it is therefore appropriate to proceed with examination of the structural relationships of the extended TPB variables.

Testing of the Extended TPB Structural Models

Gambling frequency. The results of the SEM estimation for gambling frequency reveal that the goodness-of-fit of the extended TPB model is unsatisfactory [S-B χ^2 (2, N = 419) = 7.59; p = .02; CFI = .96; RMSEA = .08, 90% CI = .03, .15; SRMR = .01]. A second SEM model was specified, with the competing model adding a direct effect of NAE on gambling frequency. The

results of the second SEM estimation reveal that the competing model fit the data adequately [S-B χ^2 (1, N = 419) = 2.64; p = .10; CFI = .99; RMSEA = .06, 90% CI = .00, .16; SRMR = .01].

For this second SEM model, NAE (b = −2.00, p < .001), attitudes (b = .13, p < .01), and PBC (b = −.13, p < .05) had statistically significant direct effects on intentions, while subjective norms was not statistically significant (p = .09). The direct effects of both intention and attitudes on gambling frequency were also statistically significant (b = .35, p < .001; b = .07, p < .05, respectively), but no significant effects of PBC or NAE on gambling frequency were observed (p = .07 and p = .10, respectively). This model accounted for a total of 28.5% of the variance in intentions to gamble, and a total of 29.8% of the variance in gambling frequency over the past 3 months. A graphical representation of the significant paths with standardized regression coefficients (b*) is provided in Figure 3.2.

The original model and the nested competing model were compared with the S-B scaled chi-square difference test to confirm that one of the model structures performed better than the other. For nested models, the S-B scaled chi-square difference test statistic is appropriate to use to test for statistical significance of the improvement to overall fit as free parameters are added under FIML estimation (Byrne, 2012). The S-B scaled chi-square difference test was found to be significant [S-B χ^2_{diff} (1) = 8.11; p < .01]. Based on the results of this comparison, the competing TPB model with an added direct effect of NAE on gambling frequency is favoured.

Problem gambling. The results of SEM estimation for perceived gambling problems reveal that the goodness-of-fit of the extended TPB model is satisfactory [S-B χ^2 (2, N = 194) = .51; p = .78; CFI = 1.00; RMSEA = .00, 90% CI = .00, .09; SRMR = .01]. NAE (b = −2.13, p < .001) and attitudes (b = .14, p < .05) had statistically significant direct effects on intentions, while subjective norms and PBC were not statistically significant (p = .35 and p = .45,

respectively). The direct effects of both intentions and PBC on gambling problems were also statistically significant ($b = .18$, $p < .05$; $b = -.21$, $p < .05$, respectively), but no significant effect of attitudes on gambling problems was observed ($p = .92$). This model accounted for a total of 29.5% of the variance in intentions to gamble, and a total of 8.3% of the variance in perceived gambling problems. A graphical representation of the significant paths with standardized regression coefficients (b*) is provided in Figure 3.3.

A second SEM model was specified to evaluate the extent that NAE influence problematic gambling behaviour, with the competing model adding a direct effect of NAE on perceived gambling problems. The results of the SEM estimation reveal that the competing model also fit the data well [S-B χ^2 (1, $N = 194$) = .01; $p = .91$; CFI = 1.00; RMSEA = .00, 90% CI = .00, .08; SRMR = .00].

The original model and the nested competing model were again compared with the S-B scaled chi-square difference test, as well as R^2 values and path coefficients, to determine if one of the model structures performed better than the other. The S-B scaled chi-square difference test was found to be non-significant [S-B χ^2_{diff} (1) = 2.54; $p = .08$]. Additionally, similar to the original model, the competing model accounted for a total of 29.5% of the variance in intention to gamble, and a total of 8.5% of the variance in perceived gambling problems. Further, while the unstandardized path coefficients for both intention and PBC on gambling problems were relatively stable ($b = .20$, $p < .05$; $b = -.21$, $p < .05$, respectively), no significant direct effect of NAE on gambling problems was observed ($p = .50$). Based on the results of these comparisons, the more parsimonious original TPB model is favoured (Klein, 2011).

Discussion

The applicability of an extended TBP model to explain gambling intentions, gambling frequency, and problem gambling among adolescents was explored. The results suggest that attitudes towards gambling, perceptions of control over refusal to gamble, and anticipation of negative post-behavioural emotions are significantly associated with intentions to gamble. Additionally, the results revealed that gambling intentions and attitudes have direct effects on frequency of gambling, while intentions and PBC are directly associated with perceived gambling problems. These findings are generally consistent with results previously reported in the research literature (Martin et al., 2010, 2011; Moore & Ohtsuka, 1997; Wu & Tang, 2012; Zeelenberg & Pieters, 2004), and therefore provide support for an extended TPB model in predicting gambling behaviours and problems among adolescents. However, the model explained greater variance in gambling frequency than gambling problems in this sample of adolescents.

An unexpected finding was that family and peer subjective norms were not associated with gambling intentions in the structural models. Within the extant literature, subjective norms have had mixed effects on intentions. The majority of studies report a significant positive association between family and peer subjective norms and gambling intentions among young adults (Martin et al., 2010, 2011; Wu & Tang, 2012). Conversely, Moore and Ohtsuka (1997) did not observe an effect of subjective norms on intentions among their combined sample of adolescents and young adults. One plausible explanation for this finding is that more intrapersonal cognitive factors (i.e., attitudes, perceptions of control, anticipation of negative emotions) have a greater direct and salient effect on intentions to gamble than more interpersonal cognitive factors (e.g., subjective norms) among younger adolescents. As proposed by Ajzen (1991), personal considerations have a tendency to overshadow the influence of perceived social

pressure on behavioural intentions. Thus, adolescents may be more inclined to refer to their own personal appraisals of the behaviour, perceptions of control over the behaviour, and evaluations of potential negative emotional consequences stemming from performing or not performing the behaviour, rather than their perceptions of others' appraisals of the behaviour, in order to make decisions about gambling.

Another possible explanation for the non-significant relationship of subjective norms with gambling intentions is the inclusion of both family and friends as referents in the estimation subjective norms. Neighbors et al. (2007) have suggested that the reference group is an important consideration for the relationship between gambling subjective norms and behaviour. They observed that youths' personal approval and their perceived friends' approval of gambling were more strongly associated with gambling behaviour, whereas perceived family's approval of gambling was not uniquely associated with gambling behaviour. As such, adolescents may be more influenced by the subjective norms of friends than those of family members, and the combination of the two referents into one measure of subjective norms may have weakened its overall effect in predicting gambling intentions.

The relative contribution of anticipated post-behavioural affect in the prediction of youth gambling and problem behaviour was also addressed. Specifically, the study investigated whether the effects of NAE on adolescent gambling frequency and problem gambling behaviours are fully mediated by gambling intentions, or if they also exert a direct influence on adolescent gambling behaviours. Consistent with the theoretical and empirical literature (Bagozzi et al., 2003; Baumeister et al., 2007), the results revealed that the addition of a direct path between NAE and gambling frequency or between NAE and perceive gambling problems were not statistically significant. The addition of this free parameter did, nevertheless, improve the model

fit for gambling frequency. The findings therefore lend empirical support to the idea that the TPB model should be extended to include NAE, and suggest that NAE generally impacts behaviour through decision-making processes under conditions of risk, particularly the selection of behavioural intentions.

Implications

The current research is unique in that it is the first to evaluate the direct and indirect effects of an extended model of the TPB strictly for adolescent gambling frequency and gambling problems. Although the explanatory value of the TPB model for youth gambling and pathological/disordered gambling behaviour has been demonstrated in the extant literature, the utility of the model for explaining adolescent gambling specifically has not been previously examined. Additionally, this research extends previous work by identifying how anticipated post-behavioural emotions can be integrated into TPB models of adolescent gambling.

The results of this study have considerable potential implications for future research, as well as prevention initiatives. The extended TPB model explained a modest proportion of variance in adolescent gambling frequency, as well as a small proportion of variance in problem gambling. Nevertheless, a sizeable proportion of variance in adolescent gambling intentions, frequency and problems remains unexplained despite the incorporation of NAE into the estimated TPB models. The importance of integrating additional components in TPB models of adolescent gambling is therefore highlighted.

Several other cognitive and experiential elements have been identified in the literature as having an influence on gambling intentions and behaviour. These include (but are not limited to): prior gambling activity and the strength of gambling habit; media exposure to gambling; impulsivity; cognitive biases; and the larger environmental or cultural context (Hing, Vitartas,

Lamont, & Fink, 2014; Lee, 2013; Liu et al., 2013; Moore & Ohtsuka, 1997; Oh & Hsu, 2001; Savard, Tremblay, & Turcotte, 2015; Vitaro, Arsenault, & Tremblay, 1999; Wu, Lai, Tong & Tao, 2013). Also, there is research evidence to suggest that distinct gambling motivations influence gambling behaviours and problems differentially (Quinlan, Goldstein, & Stewart, 2014; Stewart & Zack, 2008), and that gambling motivations moderate the relationship between gambling attitudes and gambling intentions (Thrasher, Andrew, & Mahoney, 2011). Consequently, it will be imperative for future research to explore the direct and indirect associations of these other various cognitive, motivational, and experiential elements with the original components of the extended TPB framework specifically for adolescent gambling.

The results reveal that family and peer subjective norms are not significantly associated with adolescent gambling intentions. Findings also indicate a direct effect of attitudes on gambling frequency among this population. The data therefore suggest that social norms campaigns aimed at adolescents' perceptions of family and friends' appraisals of gambling may need to consider additional intervention targets. Specifically, efforts aimed at postponing initiation of gambling behaviour or at promoting enhanced gambling decision-making among high school students should also consider enhancing adolescents' anticipation of the emotional consequences of their own gambling behaviour, decreasing their personal approval of gambling, and bolstering perceptions of their ability to refuse to gamble despite peer pressure. The beneficial effects of inducing negative anticipated affective reactions have been demonstrated in the context of safe-sex intentions and behaviours (Richard, van der Pligt, & de Vries, 1996). Further research to determine the effectiveness of such a strategy for adolescent gambling intentions and behaviour would be of value.

Limitations

While this research allows a greater appreciation for the significance of the TPB and anticipated negative emotions in explaining adolescent gambling involvement, it represents only an initial step toward understanding the initiation and maintenance of gambling behaviours among adolescents. The findings must be interpreted in light of their preliminary nature, and should be replicated before definitive conclusions can be reached. Several additional limitations to this study must be noted. First, no inferences regarding causality can be made due to the cross-sectional and correlational nature of the data. At present, it is impossible to determine whether current attitudes, social norms, perceptions of control, anticipated affective reactions, and intentions drive future gambling behaviour or influence future gambling problems. Research investigating prospective links between TPB components, anticipated emotions, and the development of gambling behaviours and problems is therefore recommended.

A second limitation is that the data in the present study were based on self-report surveys. To minimize social desirability biases, respondents were assured of the anonymity and confidentiality of their responses prior to completion of the survey. A series of checks were also used to ensure the validity of the data before analyses were performed. However, it is impossible to evaluate each respondent's actual engagement in the questionnaire and/or the seriousness with which they completed each section. Nevertheless, the prevalence rate of gambling involvement in this study suggests a representative sample that is generally consistent with previous research.

A further limitation is that the results were generated from a convenience sample. The present study surveyed adolescents from two public and one private institution in the greater metropolitan Montreal, Canada area. The results do not allow us to ascertain how well these results would generalize to all high school students given an insufficient number of comparison

groups. Further, given the nature of the sample, the findings might not be representative of all adolescents in Canada, much less other countries. To improve the results' generalizability, future studies are needed to replicate these findings in other jurisdictions and with a wider sample of students (e.g., public school, private school, alternative school).

Conclusions

Despite noted limitations, the current study provides preliminary support for the value of an extended TPB in understanding adolescent gambling behaviour, particularly gambling frequency. At the same time, the current research identifies certain deviations from the theory as it applies specifically to younger adolescents (i.e., subjective norms were not associated with gambling intentions and PBC had no direct effect on gambling frequency). Researchers and mental health professionals may want to consider anticipated affective reactions, attitudes, and perceptions of behavioural control as targets for intervention in postponing initiation to gambling or promoting gambling decision-making. Many existing adolescent problem gambling preventive interventions have been developed in the absence of a guiding theoretical framework, and for those that have been designed using a theoretical framework, evidence for sustained changes in adolescent gambling behaviour is limited. As youth gambling problems continue to be a public health concern, consideration of an extended TPB model for the development of new or inclusion in existing adolescent problem gambling preventive interventions is worthy of assessment.

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Table 3.1

Frequency of Play for Various Gambling Activities as a Percentage of the Sample

	N	Not in past 3 months	About once/ month	2-3 times/ month	About once/ week or more
Internet gambling					
Poker	398	92.7	4.3	1.8	1.2
Slot machine	393	99.5	–	0.3	0.2
Other	396	95.2	2.0	1.0	1.8
Lottery tickets	392	96.7	2.8	0.3	0.2
Instant-win scratchcards	392	92.9	6.6	0.3	0.2
Video lottery terminals (VLTs)	390	100.0	–	–	–
Casino or racetrack slot machines	392	99.2	0.5	0.3	–
Government-run sportsbooks	392	92.1	5.4	1.3	1.2
Sports betting through a bookie	392	96.7	3.1	–	0.2
Sports pools	391	87.2	6.4	2.1	4.3
Horse racing	392	99.2	0.3	–	0.5
Casino table games	392	99.2	0.5	–	0.3
Bingo	393	98.2	1.8	–	–
Raffle or fundraising tickets	393	88.8	10.4	0.8	–
Non-casino card games	391	79.8	13.0	4.6	2.6
Board or dice games	390	94.6	3.9	0.5	1.0
Arcade or video games	391	90.0	7.2	1.0	1.8
Results of games of skill	391	85.9	8.2	2.6	3.3
Performance of a dare or challenge	395	73.6	15.2	5.6	5.6
Other	393	98.0	0.8	0.2	1.0

Note. The variation in *sample size* is due to the variation of missing data for each item.

Table 3.2

Means, Standard Deviations, Ranges, and Intercorrelations for Gambling Frequency, Gambling Problems, TPB Components, and Negative Anticipated Emotions

	1	2	3	4	5	6	7
1. Gambling frequency	—	.29**	.51**	.35**	.09	.01	–.38**
2. Gambling problems		—	.23**	.11*	.09	–.25**	–.09
3. Intention			—	.40**	.25**	–.19**	–.48**
4. Attitudes				—	.29	–.03	–.58**
5. Subjective norms					—	–.26**	–.24**
6. PBC						—	.09
7. NAE							—
N	391	419	419	419	418	419	418
M	2.33	.13	12.84	36.22	78.66	33.24	3.56
SD	4.20	.49	5.17	6.73	33.16	5.10	.92
Range	.00–45.00	.00–3.00	7.00–35.00	15.00–55.00	17.00–183.27	10.00–40.00	1.00–5.00

Note. PBC = perceived behavioural control. NAE = negative anticipated emotions. The variation in *sample size* is due to the variation of missing data for each scale. * $p < .05$. ** $p < .01$

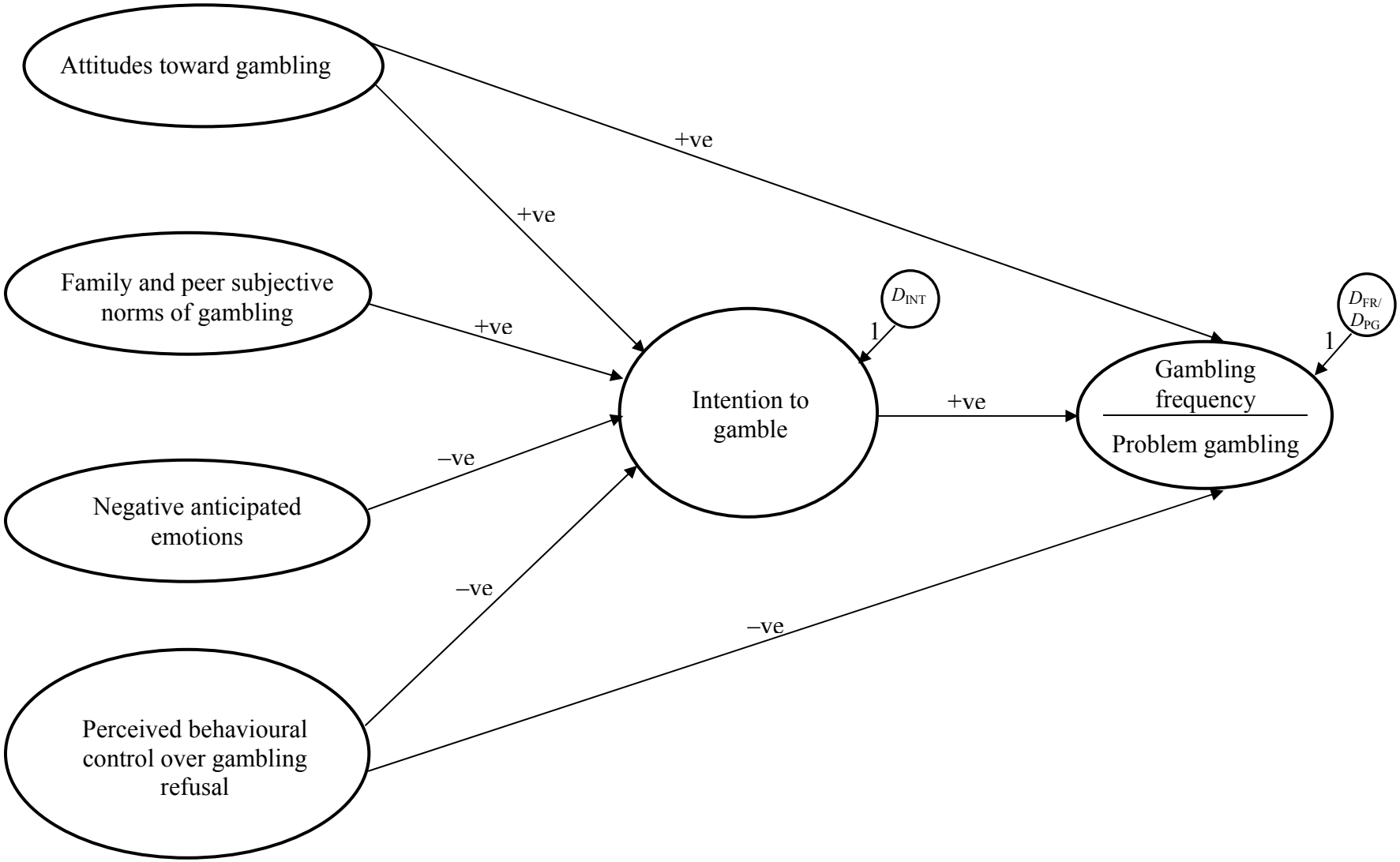

Figure 3.1. The hypothesized model of gambling frequency and perceived gambling problems. D_{INT} = disturbance or unexplained variance in intentions to gamble in the future. D_{FR} = disturbance or unexplained variance in frequency of gambling over the past three months. D_{PG} = disturbance or unexplained variance in perceived gambling problems over the past year.

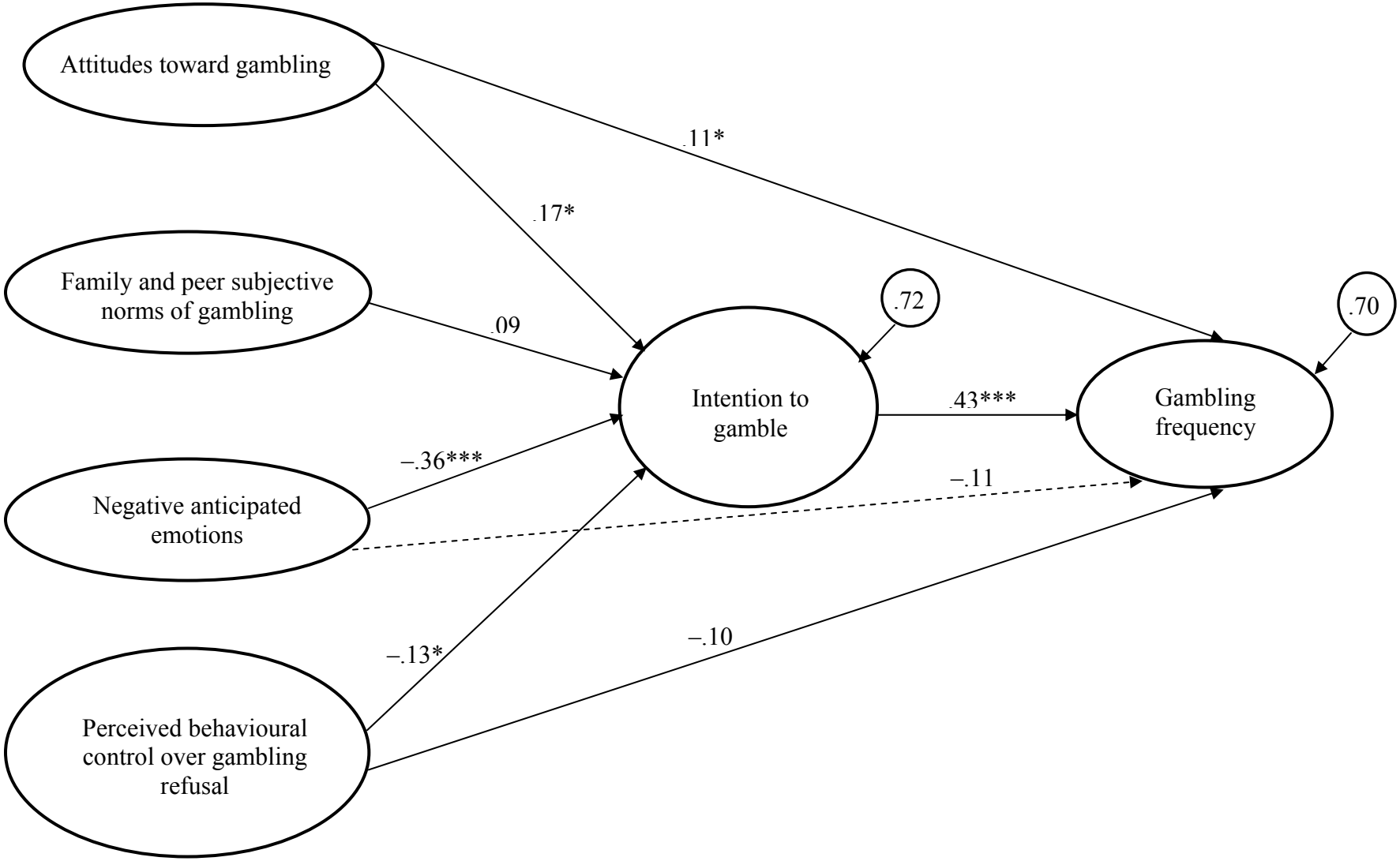

Figure 3.2. Structural model of gambling frequency with standardized coefficients ($N = 419$).

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

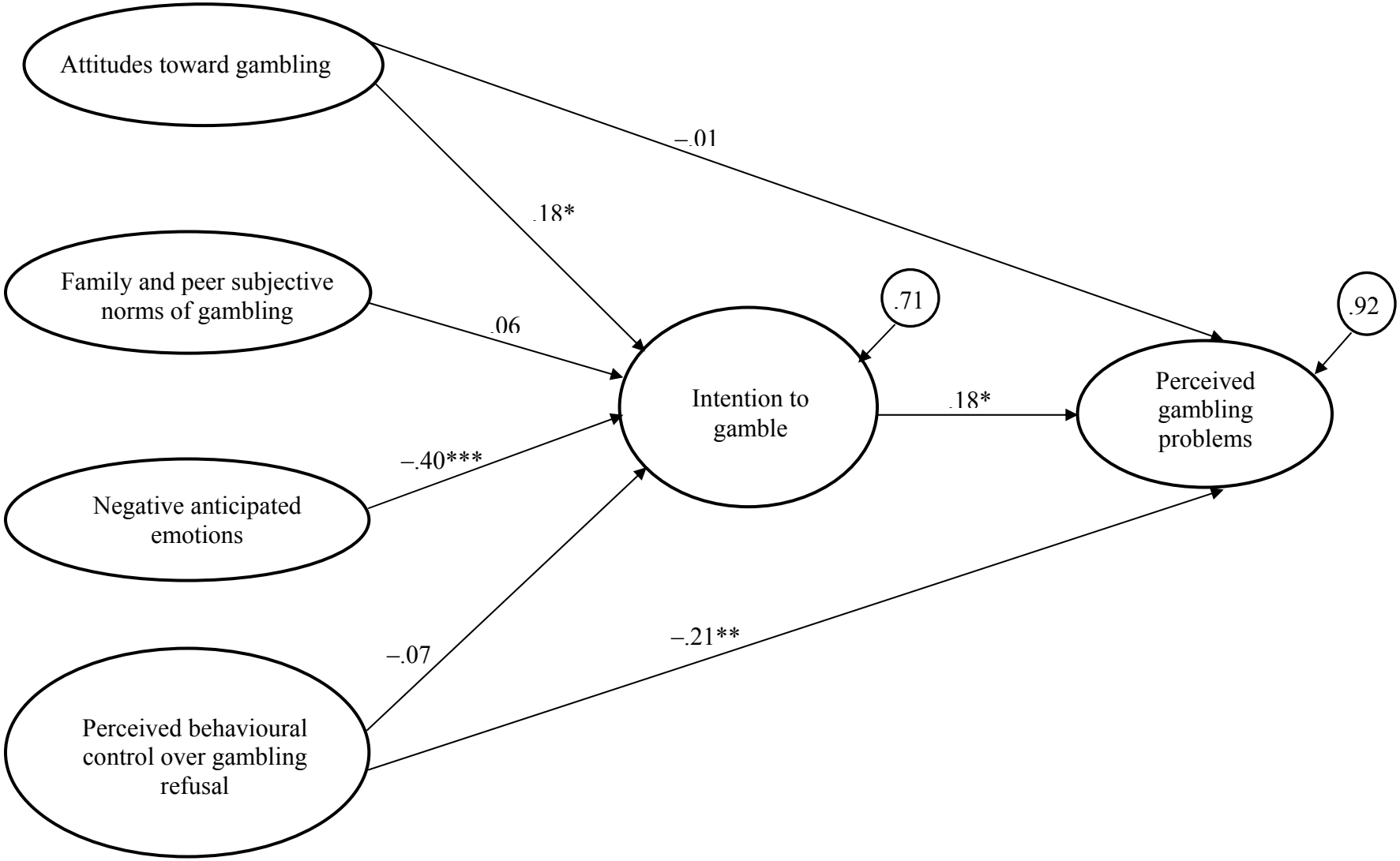

Figure 3.3. Structural model of perceived gambling problems with standardized coefficients ($N = 194$).

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

Bridging Manuscripts

There is growing evidence for the utility of the TPB framework in the formulation of effective behaviour-change interventions for risky (e.g., unsafe driving, risky sexual practices) and addictive behaviours (e.g., tobacco use, illicit drug use, alcohol use). Given this evidence, researchers have begun to advocate for consideration of the TPB as a framework for developing effective gambling prevention programs (Evans, 2003). However, before the TPB can serve to inform the design of gambling preventive interventions, it is necessary to establish that the framework is indeed valuable for explaining and predicting actual gambling behaviour.

Previous investigations have suggested that the TPB is useful for explaining gambling and problem gambling behaviour among emerging adults (e.g., Martin et al., 2010; Wu & Tang, 2012). Researchers have also explored the role of anticipated emotions in the context of gambling, and findings suggest their importance in gambling decision-making (e.g., Sheeran & Orbell, 1999; Zeelenberg & Pieters, 2004). In spite of these promising findings, no available research has investigated the utility of the TPB model or the related construct of NAE for explaining gambling behaviour uniquely among adolescents.

The first step in establishing the current program of research was to expand on this previous work and validate an extended TPB framework, which includes NAE, for understanding adolescent gambling decision-making and behaviour. To this end, Study 1 ascertained whether gambling-related attitudes, subjective norms, PBC, NAE, and intentions are associated with gambling frequency (past 3 months) and problem gambling (past year) among adolescents. The results revealed that attitudes, PBC, and NAE were all significantly associated with intentions to gamble. Additionally, gambling intentions and attitudes were demonstrated to

have a direct impact on frequency of gambling, while intentions and PBC were directly associated with perceived gambling problems.

The first manuscript in this research program reported empirical support for the value of an extended TPB in explaining adolescent gambling behaviour, and provided the foundation for future investigation of the utility of the framework. The next step in this line of inquiry was to examine the suitability of this extended TPB model for the design and evaluation of school-based problem gambling prevention initiatives. Thus, manuscript 2 explores the efficacy of targeting NAE and key TPB constructs in a universal, school-based preventive intervention for eliciting changes in adolescent gambling beliefs, intentions and behaviours. Findings from study 2 could inform us on the validity of applying an extended TPB model for the development of new or inclusion in other existing adolescent problem gambling preventive interventions.

CHAPTER IV

MANUSCRIPT 2

Evaluation of a School-Based Gambling Prevention Program for Adolescents Using the Theory of Planned Behaviour[4]

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Abstract

The theory of planned behaviour (TPB) and the concept of negative anticipated emotions (NAE) have attracted research attention in the formulation of effective preventive interventions. This approach has identified several key constructs of the TPB (i.e., intentions, attitudes, subjective norms, perceptions of behavioural control) and NAE as valid predictors of gambling behaviours and problems. However, no empirical investigation has utilized these constructs in the design or evaluation of an adolescent problem gambling preventive intervention. The current research aimed to assess the efficacy of targeting NAE and key TPB constructs in a prevention video for modifying gambling beliefs, intentions and behaviours. A sample of 280 high school students were randomly assigned to either an intervention or control condition. Participants were assessed at pre-intervention, post-intervention, and at three-month follow-up. Results reveal that the video was not effective in producing desired changes in NAE, the TPB's key constructs, or the reported frequency of gambling behaviour. The findings suggest that the video, delivered as a universal preventive intervention, may be insufficient for modifying NAE and other TPB key constructs, or for changing gambling behaviours.

Evaluation of a School-Based Gambling Prevention Program for Adolescents Using the Theory of Planned Behaviour

Introduction

Adolescent gambling and problem gambling has emerged as an area of concern over the past three decades (Volberg, Gupta, Griffiths, Ólason, & Delfabbro, 2010). While adolescent gambling behaviour may be transitory and may not necessarily lead to adult gambling (Delfabbro, King, & Griffiths, 2014; Delfabbro, Winefield, & Anderson, 2009), there is evidence that the onset of gambling behaviour in pre-adolescence or adolescence is associated with, or a marker for vulnerability to, later development of gambling problems (Rahman et al., 2012; Slutske et al., 2014; Vitaro, Wanner, Ladouceur, Brendgen, & Tremblay, 2004). Also of concern is that adolescent gambling problems are frequently linked with multiple negative consequences. Specifically, adolescent problem gambling is shown to be correlated with greater gambling expenditure, academic problems, poor or disrupted family relationships, engagement in risky sexual behaviours, delinquency, alcohol and substance use problems, mental health problems, and suicidal ideation and behaviours (Blinn-Pike, Worthy, & Jonkman, 2010; Cook et al., 2014; Hansen & Rossow, 2008; Volberg et al., 2010). Untreated problematic gambling in adolescence is further observed to be prospectively associated with criminal behaviour (Wanner, Vitaro, Carbonneau, & Tremblay, 2009), and depression (Dussault, Brendgen, Vitaro, Wanner, & Tremblay, 2011) in young adulthood. The adverse and potentially long-term consequences of adolescent gambling and gambling problems draw attention to the need for sensitizing youth to the risks associated with gambling.

In response to this need, various school-based prevention initiatives have been developed (Williams, West, & Simpson, 2012). Despite their importance, only a limited number of these

prevention initiatives have been empirically evaluated for efficacy (see St-Pierre, Temcheff, Derevensky, & Gupta, 2015 and Williams et al., 2012 for a comprehensive list and review of existing youth gambling prevention programs that have been tested for efficacy). Of those initiatives that have been systematically assessed, many have reliably obtained improvements in knowledge or decreases in misconceptions about gambling (St-Pierre, Temcheff, et al., 2015). Conversely, few of the existing prevention initiatives have been successful in producing sustained changes in skills or behaviour (St-Pierre, Temcheff, et al., 2015).

Considering that the principal goal of any prevention initiative is to decrease the incidence of a potential problematic behaviour, there is a clear need for the development of youth problem gambling prevention initiatives in the context of new theoretical models of behaviour change in order to improve the likelihood of successful long-term outcomes (Williams, Wood, & Currie, 2010). Health and social cognition research reveals that several factors can play an influential role in behaviour decision-making and change. These include: perceptions of risk in performing the behaviour; notions of self-efficacy; and intentions or motivations to change the behaviour (Ogden, 2012). It is plausible that effectiveness of existing prevention initiatives is generally restricted because they fail to target all of the salient factors found to influence behaviour change. This situation has led researchers to propose consideration of the theory of planned behaviour (TBP; Ajzen, 1991, 2002) as an alternate framework that could more accurately describe gambling behavioural decision-making processes (Cummings & Corney, 1987; Evans, 2003).

Theory of Planned Behaviour and Anticipated Emotions

A social cognition model, the TPB proposes that the execution of any behaviour is determined by the individual's intention to exert effort and complete an action. The theory

further asserts that intentions are influenced by three independent factors: attitudes, subjective norms, and perceptions of behavioural control (PBC). Attitudes consist of an individual's overall positive or negative evaluations of the behaviour. Subjective norms are an individual's perceptions of social pressure from important others to perform the behaviour. Perceptions of control represent an individual's expectations about the level of ease or difficulty in executing the behaviour.

The explanatory value of the TPB model for young adult gambling and problem gambling behaviour has received some empirical support in the literature (Martin, Nelson, Usdan, & Turner, 2011; Martin et al., 2010; Wu & Tang, 2012). Overall, these studies reveal that that gambling-related attitudes, subjective norms, and PBC are predictive of the frequency of gambling behaviour and of problem gambling. These studies also indicate that intentions to gamble mediate the relationships between gambling behaviours and the other TPB determinants. Research with younger samples has provided additional evidence for the utility of the TPB in explaining the frequency of gambling behaviour and perceived gambling problems (Moore & Ohtsuka, 1997; St-Pierre, Derevensky, Temcheff, & Gupta, in press).

A criticism of the TPB model acknowledged in the literature is the framework's strict focus on cognitive processes. Researchers have suggested that viewing decision-making for different types of risk-taking behaviours as a similar, rational process overlooks several key elements of risky behaviour (Gibbons, Houlihan, & Gerrard, 2009). One element largely ignored by the TPB is the impact of emotions or anticipated affective reactions on decision processes (Gibbons et al., 2009; Richard, de Vries, & van der Pligt, 1998; van der Pligt & de Vries, 1998). Negative anticipated emotions (NAE), such as regret and guilt, are presumed to particularly influence participation in high-risk or addictive activities. Under conditions of risk, NAE serve to

guide behavioural decision-making processes towards the gathering of relevant data to make informed choices, the selection of goals to attain, and the selection actions needed to attain the chosen goal (i.e., selection of behavioural intentions) (Bagozzi, Dholakia, & Basuroy, 2003; Baumeister et al., 2007).

Findings from empirical studies provide support for the significance of NAE in gambling decision-making and intentions (Li et al., 2010; Risen & Gilovich, 2007; Wolfson & Briggs, 2002), and their importance over and above the effects of other TPB components (Sheeran & Orbell, 1999; Zeelenberg & Pieters, 2004). Recently, in their examination of adolescent gambling behaviours, St-Pierre, Derevensky, et al. (in press) observed that adolescents' attitudes, PBC, and NAE were significantly associated with intentions to gamble. Their findings therefore lend empirical support that the TPB model of gambling behaviour should be extended to include NAE, and suggest that NAE impact gambling behaviour through decision-making processes, particularly the selection of behavioural intentions.

The TPB in Adolescent Behaviour Change Interventions

Currently in the literature, there exist a number of studies that have applied the TPB to the development of interventions aimed at modifying beliefs, intentions, and behaviours for several adolescent risk activities, or in the evaluation of these interventions (e.g., Buckley, Sheehan, & Shochet, 2010; Jemmott, Jemmott, Braverman, & Fong, 2005; Jemmott, Jemmott, Fong, & McCaffree, 1999; Poulter & McKenna, 2010). However, the theory has been relatively neglected in the field of addiction (Webb, Sniehotta, & Michie, 2010). In one study, Cuijpers, Jonkers, De Weerdt, and De Jong (2002) evaluated a TPB-based prevention program designed to target secondary school students attitudes, social norms, and self-efficacy with respect to tobacco, alcohol, and cannabis use. Their results revealed a significant decrease in the proportion

of students reporting daily tobacco use and weekly alcohol use for the intervention group but not the control group at 3-year follow-up. Guo, Lee, Liao, and Huang (2015) also evaluated the efficacy of a TPB-based substance-use preventive education program on enhancing students' behavioural intentions to abstain from illicit drug use and reducing their actual illicit drug use. They observed that students who received the prevention program demonstrated greater changes in their substance-related attitudes, subjective norms, PBC, and intentions over time than those that received no intervention. In addition, Guo and colleagues found that, compared to the control group, a significantly smaller proportion of participants in the TPB-based intervention group reported illicit drug use six months and one year following program delivery. These preliminary findings have prompted researchers to recognize the value of behaviour change theories such as the TPB in the development of interventions for addictive behaviours (Webb et al., 2010).

It is important to note that while the TPB has been demonstrated to be suitable for the development of interventions for adolescent risk and addictive behaviours because it allows for the selection of appropriate targets, the model offers limited guidance on the specific behaviour change strategies that will maximize a program's effectiveness. Decisions regarding the selection of behaviour change strategies must therefore be informed from supplementary sources of information, including other theoretical frameworks and research identifying effective tools for changing behavioural determinants (Webb et al., 2010).

Narrative communication is one method for motivating and supporting behaviour change that has been identified in the literature (Hinyard & Kreuter, 2007; Petraglia, 2007). A narrative refers to any representation of a sequence of events, characters, and consequences, which has an identifiable structure and that contains implicit messages about the topic under consideration but

does not explicitly present and defend issue-relevant arguments (Dunlop, Wakefield, & Kashima, 2010; Kreuter et al., 2007). Narrative communication is therefore characteristically different from traditional expository or advocacy persuasive messages (Dunlop et al., 2010), and can take a range of forms, including official stories regarding events, firsthand experiential stories or testimonials, and invented stories that accurate information (Hinyard & Kreuter, 2007).

The basic premise behind the utility of narrative communication in behaviour change is that individuals will be persuaded by information or messages conveyed in a narrative as they become "transported" or absorbed. The psychological process of transportation ultimately leads to changes in beliefs, intentions and behaviours by lowering resistance to persuasive appeals, reducing counter-arguing, enhancing perceptions of group and/or personal susceptibility through identification with the characters of the narrative, and allowing for individuals to engage in mental simulations of performing novel behaviours (Green, 2006; Hinyard & Kreuter, 2007). An increasing number of research projects have incorporated narrative communication in educational interventions targeting specific adolescent risk and addictive behaviours with positive results (Poulter & McKenna, 2010; Turner, Macdonald, Bartoshuk, & Zangeneh, 2008; Turner, Macdonald, & Somerset, 2008; Warren et al., 2006).

Although recent research has supported the utility of the TPB and NAE in explaining the frequency of gambling behaviour and gambling problems (Martin et al., 2010, 2011; Moore & Ohtsuka, 1997; St-Pierre, Derevensky, et al., in press; Wu & Tang, 2012), application of the TPB framework and its related construct of NAE for the design or evaluation of adolescent gambling preventive interventions has not yet been achieved. Additionally, despite a growing trend for using narrative communication in intervention programs for adolescent high-risk behaviours, only two empirically-evaluated youth problem gambling prevention initiatives to date have

incorporated narrative communication as a component for promoting changes in gambling-related beliefs and behaviours (Turner, Macdonald, Bartoshuk, el al., 2008; Turner, Macdonald, & Somerset, 2008). The content of these interventions included brief skits designed to illustrate how adolescents can become overly involved in gambling resulting from emotional distress, early wins, or erroneous beliefs about gambling. Evaluation of these programs revealed no significant effects on students' gambling attitudes, involvement, or problematic behaviours. However, it is important to note that Turner et al.'s prevention initiatives used several other strategies (e.g., mock gambling activity, group discussion, interactive lecture) in addition to narrative communication in order to promote changes in gambling-related beliefs and behaviours. As such, it is difficult to determine whether it was one particular strategy used, or the program as a whole, that was responsible for the lack of observed changes. No empirical study, to date, has specifically evaluated the effectiveness of narrative communication alone in school-based preventive interventions for adolescent gambling.

Research Goals and Hypotheses

The current study is designed to explore the efficacy of targeting NAE and key TPB constructs in a universal, school-based preventive intervention for eliciting changes in adolescent gambling beliefs, intentions and behaviours. The intervention specifically evaluated in this study is the *Clean Break* (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2006) DVD. *Clean Break* is a narrative communication intervention developed to increase adolescents' awareness and understanding of the issue of problem gambling. The unique 25-minute docudrama centers on the testimony of a problem gambler who describes his various personal experiences with gambling. In addition to the testimonial, dramatic scenarios depicting realistic situations faced by adolescents who become over-involved with gambling feature

prominently in the video-based intervention. The scenarios portray the consequences of the characters' problematic gambling behaviour on their relationships with others, as well as on their own psychological and emotional health. Further, the intervention features follow-up discussion questions. While the results from focus groups provide preliminary evidence for the appropriateness of the video for high-risk and general adolescent populations (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2006), its impact on adolescent gambling beliefs, intentions and behaviours needs to be established.

Drawing from the theoretical and empirical literature on the TPB, NAE, and behaviour change interventions, the following hypotheses are proposed: (1) greater increases in self-reported NAE are expected for students in the intervention condition than those in the control condition; (2) greater decreases in self-reported positive gambling attitudes, subjective norms, and perceptions of control are projected for students in the intervention condition than those in the control condition; and (3) greater decreases in self-reported gambling intentions and gambling frequency are expected for students in the intervention condition compared to those in the control condition.

Method

Participants

This research was designed as a controlled experimental trial. Participants were 387 adolescents in grades 9, 10, and 11 from one large secondary school in the greater Montreal, Canada area. Of those 387 participants, 280 had completed the surveys at all three measurement times, and these participants were selected for analysis. Two additional participants were excluded from the final sample due to insincere responding (e.g., inconsistent responses on reverse coded items).

Students, by individual classrooms, were randomly assigned to the video-based preventive intervention condition (n = 141; 71 males) or a control condition (n = 139; 69 males). Approximately one third of participants were in grade 9 (n = 100, 35.7%), slightly over one third were in grade 10 (n = 107, 38.2%), and a little over a quarter were in grade 11 (n = 73, 26.1%). Overall, the mean age of participants was 15.11 years (SD = .94; range = 13–17).

Measures

With the exception of items to measure frequency of gambling behaviours, all scales utilized for the purposes of this study were selected based on their use in prior research examining the applicability of an extended TPB model to adolescent gambling behaviour, and given their established psychometric properties (see St-Pierre, Derevensky, et al., in press; Temcheff, St-Pierre, Derevensky, & Gupta, 2014). Specifically, all scales have previously demonstrated acceptable internal consistency, construct validity, and discriminant validity, and items used to measure NAE showed adequate test-retest reliability.

Gambling Attitudes Scale (GAS; Moore & Ohtsuka, 1997). The GAS is a 12-item measure assessing respondents' attitudes towards gambling and its consequences. Each item is rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Items are summed to produce a scale score ranging between 12–60, with higher scores representing more positive attitudes towards gambling. The internal consistency of the scale was acceptable within this sample (Cronbach's alpha = .82).

Gambling Injunctive Norms Scale (GINS; Moore & Ohtsuka, 1997). The GINS is a 12-item scale used to assess perceived family and peer norms respecting gambling on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Two additional items are included to measure motivation to comply with a specific referent (i.e., family or friends). To provide a

single measure of subjective norms, each normative belief item is multiplied by the motivation to comply with the specific referent, and derived scores are summed together to produce a unitary subjective norms scale score. Scores on this scale range from 12–300, with higher scores representing perceptions of more positive social norms towards gambling. In the present study, the internal consistency of the GINS was acceptable (Cronbach's alpha = .82).

Perceived Control over Gambling Refusal Scale (Wu & Tang, 2012). This 10-item measure was used to assess perceived behavioural control over resisting gambling under various conditions. Participants rated each item on a 4-point Likert scale (1 = *strongly disagree*, 4 = *strongly agree*). A scale score ranging from 10–40 is obtained by summing the item responses, with higher scores representing a greater level of perceived self-control in refusing to gamble. The internal consistency of this scale was found to be excellent (Cronbach's alpha = .93).

Negative Anticipated Emotions for Gambling. A four-item scale was used to measure NAE for participating in and for becoming over-involved in gambling. The scale was adapted from other anticipated regret measures for adolescent health risk behaviours, such as smoking initiation and unprotected sexual intercourse (e.g., Conner, Sandberg, McMillan, & Higgins, 2006; Caron, Godin, Otis, & Lambert, 2004). Participants rated each item on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). The scale score consists of an average response to all items, with higher scores indicating more anticipated negative emotions regarding gambling involvement or over-involvement. The internal consistency of this scale was acceptable in this sample (Cronbach's alpha = .88).

Gambling Intention Scale (GIS; Moore & Ohtsuka, 1997). The GIS is a seven-item measure that assesses respondents' intentions to gamble on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Items are summed to produce a scale score ranging from 7–35,

with higher scores representing stronger intentions to gamble. The internal consistency of this scale was acceptable (Cronbach's alpha = .88).

Gambling Activities Questionnaire – Adapted (GAQ; Gupta & Derevensky, 1996). To determine respondents' frequency of gambling participation, 11 items from a modified version of the GAQ were administered. Items asked respondents to specify the frequency they have gambled on a variety of common gambling activities during the past three months using a 4-point Likert scale (0 = *not in the past three months*, 3 = *at least once per week or more*). Items are summed to produce a frequency scale score ranging between 0 and 44, with higher scores representing greater frequency of gambling. The internal consistency of this scale was acceptable (Cronbach's alpha = .70).

Procedure

Following approval from the ethics review committees of McGill University and Université de Sherbrooke, and subsequent to ethical review by participating school boards, requests to conduct research were distributed to all English language public schools in the region. One large institution agreed to participate. Parental consent and student assent was acquired and all eligible students were informed that participation was voluntary and they could terminate participation at any time without consequence. It was also explained that responses to the questionnaires were anonymous and confidential.

Prior to program delivery, all participating students were administered a baseline survey (Time 1) to measure identified predictors of gambling intentions, as well as participants' frequency of gambling participation. After completion of the survey, students assigned to the intervention group viewed the 25-minute video, while students in the control group proceeded with their regular academic activities. Approximately one week following completion of the

survey, students assigned to the intervention group participated in a booster discussion session for 20-25 minutes, while students in the control group proceeded with their regular academic activities. A post-intervention survey containing all scales except the GAQ was then administered to all participants (Time 2). Finally, a follow-up survey paralleling the baseline questionnaire was administered to all participating student approximately 3 months after completion of the program (Time 3).

Data Analysis

Data analysis was performed using SPSS Statistics version 22.0. Initial screening of the data revealed that less than 3% of the sample had one or more missing responses on each of the scales. Consequently, multiple imputation (MI) was selected as an appropriate method for estimating missing observations on these scales since it is considered best practice for handling missing data compared to traditional methods, such as case deletion and mean substitution (Osborne, 2013). In this study, the Markov Chain Monte Carlo (MCMC) method with 25 iterations was used to produce five multiple data sets.

All subsequent analyses were conducted using an intent-to-treat approach, where all participants were analysed in the condition to which they were randomised. Differences between groups on continuous measures (attitudes, subjective norms, PBC, NAE, and intentions) across time (pre, post, follow-up) were examined using hierarchical mixed models containing random intercept and random slope terms, as well as fixed effects for condition. In order to run mixed model analyses in SPSS for the multiple imputation pooled data set, a procedure described by van Ginkel (2014) and van Ginkel and Kroonenberg (2014) was applied to obtain *F* values, standard errors, *p*-values, and degrees of freedom for group by time interactions. This procedure involves both the reformulation of ANOVA models as regression models using effect coding of

the predictors, and the application of existing combination rules for regression models (van Ginkel & Kroonenberg, 2014). The procedure also adjusts for the degrees of freedom of the combined results.

Effect sizes were calculated from the standardized mean change within conditions divided by the standard deviation of the difference scores (see Lakens, 2013). The standard deviation of the difference scores was computed from the within-conditions sample variances and the cross-conditions correlation (see Klein, 2004). Additionally, traditional confidence intervals for dependent samples effect sizes were computed using procedures described by Klein (2004).

Results

At baseline, approximately 40% of participants (n = 277) with complete data on gambling frequency reported having gambled on at least one activity in the past three months. The data show that although participants had modest intentions to gamble (M_{pooled} = 12.54) and anticipated substantial negative emotions from gambling or becoming over-involved in gambling (M_{pooled} = 3.39), they also perceived high behavioural control for refusing to gamble (M_{pooled} = 33.34). The data also indicate that participants had moderately favourable gambling attitudes (M_{pooled} = 35.43), but their perceptions of family and peers' approval of gambling was modest (M_{pooled} = 78.08). Further, the frequency of gambling during the past three months was relatively low among participants (M_{pooled} = 1.42).

Preliminary analyses reveal that while there were no observed gender differences between the groups [χ^2 (1, N = 280) = .01, p = .91], there were significant differences between participants in the intervention versus control groups with respect to grade level [χ^2 (1, N = 280) = 26.99, p < .001, Cramer's V = .31]. Pairwise comparisons revealed that significantly fewer

grade 11 students (n = 18) were in the intervention group than grade 9 (n = 56) or grade 10 students (n = 67), χ^2 (1, N = 173) = 16.93, $p < .001$, OR = 3.89 and χ^2 (1, N = 180) = 25.09, $p < .001$, OR = 5.12, respectively.

Evaluation of Short-Term Intervention Effects

Results of mixed model analyses revealed a significant main effect of time for gambling-related attitudes, $F(1, 270.53) = 19.05$, $p < .001$, for gambling-related subjective norms, $F(1, 272.81) = 19.32$, $p < .001$, and for perceptions of control over refusal to gamble, $F(1, 270.90) = 17.48$, $p < .001$. As shown in Table 4.1, both the intervention and control group demonstrated more positive gambling attitudes at post-intervention than pre-intervention. Similarly, both the intervention and control group showed more positive peer and family subjective norms at post-intervention than pre-intervention (see Table 4.1). Further, as depicted in Table 4.1, both the intervention and control group demonstrated a decrease in perceptions of control over their ability to refuse gambling at post-intervention than pre-intervention. Small effect sizes were consistently observed across both groups.

Mixed model analyses also indicated a significant group by time interaction for intentions to gamble in the future, $F(1, 273.43) = 4.63$, $p < .05$. However, no significant group by time interactions were observed for gambling-related attitudes, subjective norms, negative anticipated emotion, or for perceptions of control over refusal to gamble (see Table 4.1). When gender and grade-level were entered into the models as covariates, analyses revealed that main effects of gender and grade-level, as well as all interactions with gender or grade-level did not reach statistical significance.

Evaluation of the Maintenance of Intervention Effects

Mixed model analyses were used to investigate the maintenance of effects at 3-month follow-up for both the intervention and control groups. Results revealed a significant main effect of time for gambling-related attitudes, $F(1, 272.81) = 30.28$, $p < .001$, subjective norms, $F(1, 249.99) = 13.41$, $p < .001$, and negative anticipated emotions, $F(1, 273.38) = 9.81$, $p < .05$. As shown in Table 4.2, both the intervention and control group demonstrated more positive gambling attitudes from pre-intervention to follow-up. Similarly, both the intervention and control group showed more positive peer and family subjective norms from pre-intervention to follow-up (see Table 4.2). Further, both the intervention and control group demonstrated a decrease in negative anticipated emotions from pre-intervention to follow-up. Results also indicated a significant main effect of time for frequency of gambling behaviour, $F(1, 236.51) = 5.37$, $p < .05$. Specifically, both the intervention and control groups demonstrated a decrease in frequency of play from pre-intervention to follow-up (see Table 4.2). Again, small effect sizes were observed for both groups across the different variables.

However, mixed model analyses revealed no significant group by time interactions for gambling-related attitudes, subjective norms, perceptions of control, negative anticipated emotion, or intentions, indicating that changes from pre-intervention to follow-up were not statistically different between the intervention and control groups. Additionally, no significant group by time interaction was observed for frequency of gambling behaviour. Further, when gender and grade-level were again entered into the models as covariates, analyses revealed that main effects of gender and grade-level, as well as all interactions with gender or grade-level did not reach statistical significance.

Discussion

This study aimed to test the efficacy of a universal adolescent gambling prevention tool, the *Clean Break* docudrama, for modifying gambling beliefs, intentions and behaviours. The results suggest that none of the initial hypotheses were confirmed. Rather, adolescents in both the intervention group and the control group reported minor increases in positive gambling attitudes and positive peer and family subjective norms at post-intervention and at follow-up. Additionally, while adolescents reported a slight decrease in perceptions of control over their ability to refuse gambling at post-intervention, as well as negligible decreases in negative anticipated emotions and frequency of gambling behaviour at follow-up, no significant group differences were found. Further, no significant changes were revealed for gambling intentions at follow-up for either group. However, the intervention group's intentions to gamble in the future were observed to be stable from pre- to post-intervention, while the control group reported a minor but significant increase in intentions to gamble at post-intervention.

Overall, the results of this study suggest that the *Clean Break* narrative communication intervention delivered to a general audience in isolation may not be sufficient for modifying the theoretically-important predictors of gambling intentions, and may be insufficient for changing gambling behaviours. These findings are largely inconsistent with other research that has applied the TPB to the development or evaluation of preventive interventions for various adolescent risk or addictive activities (e.g., Buckley et al., 2010; Cuijpers et al., 2002; Guo et al., 2015; Jemmott et al., 1999, 2005; Poulter & McKenna, 2010). In contrast, they are in line with research that included a narrative communication component within a brief adolescent problem gambling preventive intervention (e.g., Turner, Macdonald, Bartoshuk, el al., 2008). There may be several plausible explanations for this study's paradoxical findings.

One possible reason that *Clean Break* may not have successfully modified the theoretically-important precursors of gambling intentions and gambling behaviour is that it was delivered as "universal" adolescent gambling prevention tool. Similar to this study, previous research on program effectiveness (e.g., Buckley et al., 2010; Cuijpers et al., 2002; Guo et al., 2015; Jemmott et al., 1999, 2005; Poulter & McKenna, 2010; Turner, Macdonald, Bartoshuk, el al., 2008; Turner, Macdonald, & Somerset, 2008) had targeted student populations not identified on the basis of individual risk. However, the *Clean Break* intervention was originally intended to address the needs of high-risk adolescents, while "still being compelling to all teens" (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2006, pp. 5). It is possible that *Clean Break* may not be a preventive intervention suitable for adolescents who have never gambled or have gambled infrequently. Gillespie, Derevensky, and Gupta (2007) contend that adolescents who do not gamble are acutely aware of the risks of gambling and, as such, additional risk messages may do little to change their immediate behaviour since their gambling is not problematic. Indeed, Turner, Macdonald, and Somerset (2008) observed that their program generally had the strongest impact for those students who were most in need of the information (i.e., those students who gambled more problematically). Gillespie et al. (2007) also maintain that for social, recreational, or low frequency gamblers, the strength of risk messages may be weakened as these adolescents often experience the positive outcomes of gambling in the absence of negative ones. Further, Breitenbecher and Scarce (2001) assert that awareness campaigns often are unsuccessful because the information or persuasive messages presented, while viewed as powerful, are not perceived as being personally relevant or applicable to the intended targets. Given that participants in the intervention group reported being low frequency gamblers at baseline, it is conceivable that the persuasive appeal of the risk messages integrated

within the *Clean Break* intervention was weak among this sample. It remains unclear whether this intervention would result in successful outcomes when used as a selective prevention tool for higher frequency adolescent gamblers or adolescents at risk for developing gambling problems, and should be systematically investigated.

Another plausible reason that the *Clean Break* prevention tool may not be ideal for modifying the proposed predictors of gambling intentions and behaviours is that the intervention was not specifically designed from an extended TPB framework. According to Nation et al. (2003) and Weissberg, Kumpfer, and Seligman (2003), effective youth prevention programs are tailored to the community, cultural and developmental norms of the participants and make efforts to include the target group in program planning. Michie and Prestwich (2010) further propose that effective interventions utilize an empirically-validated theory to tailor the intervention to the target group. Although the video's storylines addresses certain behavioural, normative, and control beliefs about gambling, (e.g., "gambling with friends is a harmless form of entertainment for teens", "most friends/family members think it's acceptable to gamble"), selection of the beliefs to be targeted in the video stemmed from previous empirical research or from professional expertise in the treatment of youth gambling problems rather than being based directly on the TPB framework. Instead, the study only utilized measures of the framework's constructs to evaluate the efficacy of the prevention video. Also, it was assumed that the dramatic depictions of the negative emotional consequences associated with excessive gambling would be likely to enhance students' anticipation of the emotional consequences of their own gambling behaviour. However, negative anticipated emotions were not explicitly addressed in the intervention. As such, it is plausible that efficacy of this prevention tool was restricted because it was not expressly developed based on the TPB framework and may not have targeted

a sufficient number of the salient TPB-related beliefs proposed to influence behaviour change. In fact, Fishbein and Ajzen (2010) contend that a modification to one or two beliefs may not be sufficient to produce a change in attitude, perceived social norm, or perceived control.

Related to the above issue, the *Clean Break* narrative communication intervention is not explicitly designed to alter students' gambling-related beliefs, intentions, or behaviours. Rather, the video aims to increase adolescents' awareness and understanding of the warning signs and "potential dangers associated with excessive gambling" (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2006, pp. 3). We did not, however, measure changes in participants' knowledge or misconceptions about gambling given the current study's strict focus on the TPB and its theoretically-important predictors of gambling intentions and behaviours. It may be that *Clean Break* is an intervention that is well suited for improving knowledge or decreasing misconceptions about gambling, particularly since the majority of existing video-based prevention initiatives have reliably obtained improvements in knowledge or decreases in misconceptions about gambling (St-Pierre, Temcheff, et al., 2015). This would need to be clarified in future research.

Likewise, it may be the case that the outcome measures used for the current study (e.g., reduced frequency of gambling) are incongruous with the aims of the *Clean Break* intervention. The video was originally designed as a sensitization and harm-minimization tool for use with high-risk adolescents, such as adolescents in alternative schools and treatment settings, high school drop outs, homeless youth, and young people in detention centers (International Centre for Youth Gambling Problems and High-Risk Behaviors, 2006). Midford (2009) argues that proper selection of outcome measures that are directly related to a prevention program's goals is important in developing a meaningful evaluation. He also contends that with harm-reduction

interventions, the measurable objective should be a reduction in harm, rather than abstinence from use or use reduction, especially when the product is legally available, socially acceptable, and readily accessed (e.g., alcohol, gambling). Midford further asserts that harm-reduction programs may have a differential effectiveness in terms of reduced harm vs. reduced use. Indeed, McBride, Farrington, Midford, Meuleners and Phillips (2004) noted that high school students who received the School Health and Alcohol Harm Reduction Project (SHAHRP) intervention were only 4.2% less likely to consume alcohol at risky levels 32 months later, but were 22.9% less likely to experience alcohol-related harm from their own use. It is therefore possible that the *Clean Break* intervention may be efficacious in minimizing the risk of harm associated with one's own (or other people's) gambling, by sensitizing youth to the potential dangers and warning signs of excessive gambling, but have no effect on the frequency of gambling behaviour. This would need to be clarified in future efficacy research with high-risk adolescent groups.

A final plausible reason for the observed lack of changes is that *Clean Break* consists of a brief, video-based intervention combined with a concise discussion session. Nation et al. (2003) and Weissberg et al. (2003) indicate that the most effective youth prevention programs are comprehensive and incorporate a combination of interventions to address the salient precursors or mediators of the problem behaviour. They also reveal that effective youth prevention programs use diverse teaching methods that focus on acquiring or enhancing skills in addition to increasing awareness of the problem behaviour. Indeed, many of the effective TPB-based interventions targeting youth high-risk or addictive behaviours were multi-session curricula, included various types of learning activities and teaching tools, and/or incorporated a skills training component (e.g., Buckley et al., 2010; Cuijpers et al., 2002; Guo et al., 2015; Jemmott et

al., 1999, 2005). As such, the efficacy of this prevention tool in changing gambling intentions and behaviour, by itself, may have been restricted because of its brevity (i.e., 50-minute single-session format) and its failure to incorporate multiple interventions for addressing the salient precursors of gambling intentions and behaviour. Indeed, Turner, Macdonald, and Somerset (2008) indicated that that the time frame of a one-hour intervention was insufficient to have any substantial effect and, as a consequence, they developed a preventive curriculum in order to deliver gambling-related material in a more sustained manner. The efficacy of this prevention tool as part of a comprehensive curriculum needs to be explored (see Table 2 in St-Pierre, Temcheff, et al., 2015 for a list of other effective intervention strategies for changing TPB behavioural determinants).

Implications and Limitations

The current research is original in its examination of the applicability of an extended TPB framework to the evaluation of a school-based, adolescent problem gambling preventive intervention. Several existing youth problem gambling prevention initiatives target the development of adolescent decision-making skills, the strengthening of their skills for resisting peer pressure and coping with stressful life events, and the enhancement of their self-esteem and self-image, in combination with increasing knowledge and reducing erroneous cognitions. The impact of enhancing the salience of anticipatory negative emotions and gambling-related beliefs in a problem gambling preventive intervention on adolescents' gambling intentions and frequency of play has not been examined.

This research reveals that the *Clean Break* docudrama delivered as a *universal* prevention tool may be insufficient for modifying the theoretically-important predictors of gambling intentions and behaviour, or for changing the frequency of gambling. Although this study

represents only an initial step towards testing the applicability of an extended TPB framework to the design and evaluation of a youth problem gambling prevention initiative, the findings have important implications for guiding future prevention work. Indeed, the findings suggest that adolescent problem gambling preventive interventions like *Clean Break* may need to be incorporated within more intensive and comprehensive curricula, and may be more useful as selective preventive interventions targeting higher frequency adolescent gamblers or at-risk adolescents since there is more latitude for change. This study's findings also suggest that addressing a larger number of TPB-related beliefs about gambling in a preventive intervention like *Clean Break* may be necessary for producing significant changes in the precursors of gambling-related intentions and behaviours.

Still, the findings must be interpreted in light of their preliminary nature, and future research is needed before definitive conclusions may be reached. Other study limitations should also be considered. Firstly, the data in this research were based on self-report surveys. Respondents were assured of the anonymity and confidentiality of their responses prior to completion of the surveys in order to minimize social desirability biases. A series of checks were also used to ensure the validity of the data before analyses were performed. However, it is impossible to ascertain each participant's actual engagement during the intervention or the assessment process, as well as the seriousness with which they completed the surveys. Nevertheless, the baseline survey responses in this study were largely consistent with previous research by St-Pierre and colleagues (in press), and therefore suggest a generally representative sample.

A second limitation is that the results were generated from a convenience sample. The current study tested the efficacy of the *Clean Break* prevention tool at only one public institution

in the greater Montreal, Canada area. The data do not permit us to determine how well these results would generalize to all high school students, or even high-risk students, given a lack of comparison groups. Further, in view of the nature of the sample, the findings may not be representative of all adolescents in Canada, much less other countries. To improve the results' generalizability, future studies are needed in other jurisdictions and with a wider sample of adolescents (e.g., private school students, alternative school students, adolescents in youth residential facilities).

Conclusions

The necessity of adolescent problem gambling prevention initiatives is increasingly acknowledged by researchers, mental health professionals, and public policy makers given the negative, potentially long-term consequences of adolescent gambling problems. In response to this need, several school-based prevention initiatives have been made available. Their importance notwithstanding, empirical evidence for sustained changes in adolescent gambling and problem gambling behaviour is limited. This study aimed to test the efficacy of the *Clean Break* docudrama for eliciting changes in the extended TPB's proposed predictors of intentions to gamble in the future and of frequency of play behaviour (i.e., attitudes, subjective norms, PBC, and NAE). Results suggest that the *Clean Break* video delivered as a universal preventive intervention may be insufficient for modifying NAE and other TPB key constructs, or for changing gambling behaviours. Future studies should investigate the prevention tool's efficacy in improving knowledge or decreasing misconceptions about gambling, and its suitability as a preventive intervention for other populations (e.g., higher frequency adolescent gamblers or high-risk teenagers, adolescents from other jurisdictions).

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Table 4.1

Short-Term Intervention Effects

Parameter	Intervention (n = 141)				Control (n = 139)			
	M	*SE*	Effect size[a]	95% CI	*M*	*SE*	Effect size[a]	95% CI
Attitudes			0.14	[0.03, 0.25]			0.18	[0.08, 0.28]
Pre-test	35.03	0.54			35.83	0.54		
Post-test	35.94	0.55			37.03	0.58		
Subjective Norms			0.22	[0.07, 0.37]			0.23	[0.09, 0.38]
Pre-test	78.55	2.91			77.60	3.02		
Post-test	86.06	2.92			85.85	2.99		
Perceived Behavioural Control			0.18	[0.04, 0.33]			0.25	[0.10, 0.39]
Pre-test	33.54	0.44			33.14	0.45		
Post-test	32.60	0.41			31.89	0.38		
Negative Anticipated Emotions			0.17	[0.04, 0.30]			0.00	[–0.13, 0.13]
Pre-test	3.45	0.07			3.34	0.07		
Post-test	3.59	0.07			3.33	0.08		
Intentions			0.08	[–0.09, 0.24]			0.17	[0.02, 0.32]
Pre-test	12.89	0.48			12.19	0.48		
Post-test	12.45	0.48			13.17	0.49		

Note. M is the pooled mean values calculated from multiple imputation data sets. *SE* is the pooled standard error values calculated from multiple imputation data sets. 95% CI is the 95% confidence intervals of effect sizes.

[a] Effect size is the standardized mean difference effect size for single-group repeated measures design, expressed as Cohen's d_{rm}.

Table 4.2

Maintenance of Intervention Effects

Parameter	Intervention (n = 141)				Control (n = 139)			
	M	*SE*	Effect size[a]	95% CI	*M*	*SE*	Effect size[a]	95% CI
Attitudes			0.21	[0.09, 0.34]			0.23	[0.13, 0.33]
Pre-test	35.03	0.54			35.83	0.54		
Follow-up	36.39	0.55			37.35	0.59		
Subjective Norms			0.22	[0.07, 0.38]			0.20	[0.04, 0.36]
Pre-test	78.55	2.91			77.60	3.02		
Follow-up	86.60	3.11			84.36	2.81		
Perceived Behavioural Control			0.01	[–0.16, 0.19]			0.10	[–0.07, 0.26]
Pre-test	33.54	0.44			33.14	0.45		
Follow-up	33.60	0.42			32.62	0.42		
Negative Anticipated Emotions			0.11	[–0.04, 0.25]			0.16	[0.04, 0.29]
Pre-test	3.45	0.07			3.34	0.07		
Follow-up	3.36	0.07			3.19	0.08		
Intentions			0.15	[–0.03, 0.32]			0.05	[–0.09, 0.19]
Pre-test	12.89	0.48			12.19	0.48		
Follow-up	12.08	0.45			12.45	0.49		
Frequency of gambling			.008	[–0.07, 0.23]			0.19	[0.01, 0.37]
Pre-test	1.40	0.21			1.44			
Follow-up	1.20	0.20			0.95			

Note. M is the pooled mean values calculated from multiple imputation data sets. *SE* is the pooled standard error values calculated from multiple imputation data sets. 95% CI. is the 95% confidence intervals of effect sizes.

[a] Effect size is the standardized mean difference effect size for single-group repeated measures design, expressed as Cohen's d_{rm}.

CHAPTER V

General Discussion

Summary of Findings and Original Contributions to Knowledge

The TPB has been a major theoretical approach used to guide adolescent health behaviour research over the past three decades (Sniehotta, Presseau, & Araújo-Soares, 2014), including research aimed at the formulation of effective behaviour-change interventions for youth health behaviours. Given the adverse and serious implications of gambling problems on adolescent health and well-being, the TPB has also been proposed as a potentially useful framework for understanding gambling behavioural decision-making processes (Cummings & Corney, 1987; Martin et al., 2010) and for developing gambling prevention programs (Evans, 2003).

Evidence from a small number of correlational studies has demonstrated that the key TPB constructs (i.e., intentions, attitudes, subjective norms, PBC) account for a small to moderate proportion of variability in gambling and problem gambling behaviour (e.g., Martin et al., 2010; 2011; Moore & Ohtsuka, 1997; Wu & Tang, 2012). However, a significant issue with the TPB is that it focuses exclusively on cognitive processes to explain gambling decision-making and action, which is problematic since gambling behaviour is also shown to be influenced by emotional processes (Brown et al., 2004; Gee et al., 2005; Hills et al., 2001). As such, researchers have investigated the contribution of NAE in the context of gambling, and initial findings suggest their importance in gambling decision-making and intentions (e.g., Li et al., 2010; Risen & Gilovich, 2007; Sheeran & Orbell, 1999; Wolfson & Briggs, 2002; Zeelenberg & Pieters, 2004).

Despite past research attention to the TPB and the related construct of NAE in the gambling literature, little to no available research has investigated the whether an extended TPB

framework would account for significant variability in gambling behaviour exclusively among adolescents, or whether the framework may be suitable for informing the design of school-based problem gambling preventive initiatives. Thus, the present program of research sought to investigate the applicability of an extended TPB framework to the adolescent gambling context. Specifically, the overarching goal of this research was to extend the literature validating this extended TPB as a comprehensive model of adolescent gambling behaviour, and as a guiding framework for evaluating school-based problem gambling prevention initiatives.

The first manuscript expands on previous work by exploring the value of an extended TPB model for explaining adolescent gambling frequency and problems. Specifically, structural equation models were estimated, using cross-sectional data collected from 419 high school students (ages 14-17), in order to determine the significance of both direct and indirect effects of NAE and the TPB components on the frequency of gambling and on the perceived gambling problems. The results supported an extended TPB as a valid framework for explaining adolescent gambling behaviour, particularly gambling frequency. Indeed, attitudes towards gambling, perceptions of control over refusal to gamble, and anticipation of negative post-behavioural emotions were observed to be significantly associated with intentions to gamble. Additionally, gambling intentions and attitudes were found to have direct effects on the frequency of gambling, while intentions and PBC were directly associated with perceived gambling problems. Simultaneously, the results suggested certain deviations from the TPB as it applies specifically to adolescents. That is, subjective norms were not found to be associated with gambling intentions, while PBC was observed to have no direct effect on gambling frequency.

Establishing evidence for the validity of an extended TPB framework is a substantial contribution to the field as it helps to identify potential pathways to the development of frequent

or excessive gambling behaviour uniquely among adolescents. In addition to being the first study to validate this framework in the context of adolescent gambling, this study also extends research in the area of affective forecasting and gambling by demonstrating how anticipated post-behavioural emotions can be integrated into models of adolescent gambling decision-making. Consistent with the adult literature (Bagozzi et al., 2003; Baumeister et al., 2007; Taylor, 2007), the results suggest that NAE generally impact adolescent gambling behaviour through decision-making processes, particularly the selection of behavioural intentions. As a first step in this program of research, Manuscript 1 lays the groundwork for future investigation of the value of an extended TPB in the context of adolescent gambling.

Consequently, the next step in this line of inquiry was to examine the applicability of this extended TPB model to universal, school-based problem gambling preventive initiatives. Although several school-based problem gambling prevention initiatives are currently available, empirical evidence for sustained changes in adolescent gambling and problem gambling behaviour is limited (e.g., Ladouceur et al., 2012; St-Pierre, Temcheff, et al., 2015; Williams et al., 2012). It is possible that effectiveness of these prevention initiatives is restricted because they fail to target all of the salient factors found to influence behaviour change. Given evidence for the utility of the TPB model in the formulation of effective behaviour-change interventions for multiple adolescent risky and addictive behaviours (e.g., Buckley et al., 2010; Cuijpers et al., 2002; Guo et al., 2015; Jemmott et al., 1999, 2005; Poulter & McKenna, 2010), it was of interest to examine the suitability of the framework for the formulation of adolescent problem gambling preventive interventions and the assessment of their effects.

The second manuscript expands on previous work and investigates the efficacy of targeting NAE and key TPB constructs in a universal adolescent gambling prevention tool, the

Clean Break docudrama, for eliciting changes in gambling beliefs, intentions and behaviours. Effects of the intervention across time (i.e., pre-intervention, post-intervention, follow-up) were examined with hierarchical mixed models, using multiply imputed data collected from 280 high school students. The results revealed that *Clean Break* preventive intervention was ineffective in producing changes in NAE, the TPB's key constructs, or the frequency of gambling behaviour in the desired direction over the three-month time frame. As such, the findings suggest that a brief one-session, TBP-based preventive intervention delivered to a general audience of low frequency gamblers, in isolation, may be insufficient for modifying the theoretically-important correlates of behaviour or for changing actual frequency of play. The findings also highlight the need for addressing a sufficient number of TPB-related beliefs about gambling in a preventive intervention like *Clean Break* to effectively producing significant changes in the precursors of intentions to gamble or actual gambling behaviours. This second study therefore broadens the knowledge base related to the adolescent problem gambling prevention, as it is the first to suggest that application of an extended TPB model, which features NAE, to *existing* adolescent problem gambling preventive interventions does not necessarily elicit behaviour change. It nevertheless remains unclear whether the intervention would be effective for higher frequency adolescent gamblers or for emerging adults, as they become of legal age and have greater accessibility to government-owned or -regulated forms of gambling. It is understood that young people will likely gamble more frequently as they transition from adolescence to early adulthood given their greater accessibility to multiple gambling opportunities and venues (Delfabbro et al., 2014; Stinchfield, 2011; Welte, Barnes, Tidwell, & Hoffman, 2011). Therefore, it is plausible that high-frequency adolescent gamblers or that certain young adults will later reflect on the

persuasive messages contained within the *Clean Break* intervention as they begin to experience negative consequences resulting from their frequent or excessive gambling.

Taken together, the findings from the current program of research extend our understanding of the value of the TPB in the context of gambling. The present findings suggest that the extended TPB is a valuable framework for describing the rational, cognitive processes involved in adolescent gambling intention formation and, to some extent, adolescent gambling frequency. Certainly, the results from Manuscript 1 revealed that attitudes, perceptions of behavioural control, and NAE explained a moderate proportion of variance in intentions to gamble, and that attitudes and intentions explained a moderate proportion of variance in the frequency of adolescent play behaviour. However, the findings from the current research program also suggest that further elaboration of the extended TPB framework is warranted. While the extended TPB model in Manuscript 1 was observed to explain a moderate proportion of variance in adolescent gambling intentions and frequency, a sizeable proportion of variance still remained unexplained. Concurring with and extending upon these findings, results from Manuscript 2 indicated that targeting NAE and key TPB constructs in an school-based gambling prevention program did not elicit significant changes in underage adolescents' self-reported gambling intentions or the frequency of their gambling behaviour in the desired direction over the three-month time frame. Combined, the findings from the current research program provide a substantial contribution to the field as they represent an initial first step towards the development of stronger theoretical models of youth gambling behaviour that are valuable for the development of problem gambling prevention initiatives.

Implications, Limitations, and Directions for Future Research

Theoretical Implications

Results stemming from this program of research have important implications for theory development. The present findings provide evidence for greater recognition of the less "reasoned" or "planned" processes of gambling decision-making, particularly among adolescents. Researchers have proposed that, over and above analytical processes, adolescent decision-making related to health risk behaviours also involves more reactive or heuristic processes (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008; Gibbons et al., 2009). In line with this proposal, findings from this program of research suggest that anticipation of negative post-behavioural emotions influence actual gambling behaviour through the selection of behavioural intentions.

At the same time, findings from this program of study also suggest that attention to emotional processes alone may be insufficient for adequately explaining adolescent gambling intentions or gambling behaviour. Indeed, a sizeable proportion of variance in gambling intentions, in frequency of gambling behaviour, and in perceived gambling problems still remained unexplained despite the incorporation of NAE into the estimated TPB models. The importance of integrating additional emotional and/or experiential components in TPB models of adolescent gambling is therefore highlighted.

To improve the predictive value of existing health behaviour theories like the TPB, alternative models of health risk decision-making have been developed. One particularly promising alternate model is the prototype/willingness (P/W) model (Gibbons, Gerrard, & Lane, 2003). This dual-process model proposes two qualitatively distinct pathways to adolescent health risk behaviour decision-making: a reasoned or analytic pathway and a social reaction pathway.

Both of these pathways incorporate constructs from the TPB, as well as unique cognitive, affective and heuristic or experiential elements. Unique cognitive and heuristic elements identified in the reasoned and social reaction pathways include (but are not limited to): prior gambling activity and the strength of gambling habit; willingness or openness to engage in gambling or risky behaviour; mental representations of gamblers or risk-takers versus abstainers; media exposure to gambling; and environmental or cultural context (Gerrard et al., 2008; Gibbons et al., 2009; Lee, 2013; Oh & Hsu, 2001; Savard et al., 2015; Wu et al., 2013). However, the value of the P/W model of health risk decision-making has not been extensively investigated in the gambling field. It will be imperative for future research to explore the direct and indirect associations of these various cognitive and heuristic elements with the original components of the extended TPB framework specifically for adolescent gambling, as well as their suitability for adolescent preventive intervention design and evaluation.

Implications for Practice

It is clear that the TPB has been successfully applied in the formulation of effective behaviour-change interventions for multiple adolescent risky and addictive behaviours (e.g., Buckley et al., 2010; Cuijpers et al., 2002; Guo et al., 2015; Jemmott et al., 1999, 2005; Poulter & McKenna, 2010). However, until now, the TPB is a framework that had not yet been fully explored within the adolescent problem gambling prevention context. Also, the impact of incorporating NAE as a target for intervention in adolescent problem gambling prevention has not been previously established. As such, the results of the present research program have considerable implications for prevention practice in schools.

First, the findings from the two studies that comprise this program of study suggest that attention to emotional factors and other TPB-derived cognitive targets is likely insufficient for

promoting changes in adolescent gambling intentions or gambling behaviour. As mentioned earlier, a substantial proportion of variance in gambling intentions, in frequency of gambling behaviour, and in perceived gambling problems still remained unexplained despite the incorporation of NAE into the estimated TPB models. Further, targeting NAE and other key TPB constructs in the *Clean Break* universal preventive intervention was inadequate for eliciting desired changes in gambling intentions or the frequency of gambling behaviour. The need for adolescent problem gambling preventive interventions to target additional cognitive and experiential components and use alternate heuristic approaches in order to produce sustained changes in gambling intentions and behaviour is therefore underscored by the current research. Additional targets and heuristic approaches identified in the health risk behaviour intervention literature that may potentially be useful for school-based adolescent gambling prevention initiatives include: (1) targeting adolescents' mental representations of problem/non-problem gamblers by strengthening/weakening the perceived similarity to these images; and (2) targeting adolescents' willingness or openness to gambling via education on differences between intentional or planned and reactive behaviours (Gerrard, 2008; Gibbons, 2009).

Additionally, the findings of this research program provide evidence that TPB-based adolescent gambling prevention programs need be tailored to developmental norms and characteristics of the participants, and that efforts should be made to include the target group in program design. Indeed, the results of Study 2 suggest that the *Clean Break* docudrama, delivered as a universal prevention tool, may not be effective for adolescents who had never engaged in the target behaviour or had participated in it infrequently. This is not entirely surprising given our current understanding that the TPB differentially predicts the frequency of play behaviour among non-problem and problem gamblers (Martin et al., 2011), and that school-

based problem gambling prevention programs have a greater impact on students most in need (Turner, Macdonald, & Somerset, 2008), such as high frequency gamblers and adolescents at risk-for developing gambling problems. The TPB offers recommendations that may be useful for developing and individualizing future school-based adolescent problem gambling prevention programs (Fishbein & Ajzen, 2010; Romano & Netland, 2008). One important consideration is the presence of floor or ceiling effects. Specifically, if the target population is already in strong agreement or disagreement with a particular belief, there is little that can be done to reinforce or weaken the belief further (Fishbein & Ajzen, 2010). A second necessary consideration is the strength of association between the belief and behavioural intention. Beliefs that discriminate between individuals who intend to perform (or do perform) a particular behaviour and individuals who do not can be identified by examining the strength of the belief-intention correlation, and it is proposed that stronger correlations will increase the likelihood of achieving changes in intentions through modifications of beliefs. A final essential consideration is the perceived feasibility of changing the belief under consideration. Generally, beliefs that are based on personal experience are much more resistant to change that those based on second-hand information (Fishbein & Ajzen, 2010).

Further, the findings of this program of research highlight the need for future TPB-based adolescent problem gambling preventive interventions to be incorporated within more intensive and comprehensive curricula, which utilize a combination of intervention techniques and teaching methods to address the salient precursors or mediators of the problem behaviour. In line with observations by Turner, Macdonald, and Somerset (2008), the results of the present research indicated that a brief, video-based intervention may be insufficient for changing gambling behaviour. However, its efficacy is likely to have been restricted because of its brevity and its

failure to incorporate multiple interventions for addressing the correlates of gambling intentions and behaviour previously identified in this research program. Certainly, many of the effective TPB-based interventions targeting youth high-risk or addictive behaviours were multi-session curricula, included various types of learning activities and teaching tools, and/or incorporated a skills training component (e.g., Buckley et al., 2010; Cuijpers et al., 2002; Guo et al., 2015; Jemmott et al., 1999, 2005). In light of the present findings, it appears important for prevention practitioners to draw upon recognised theoretical frameworks (e.g., P/W model) and well-developed research outside of the TPB in order to select multiple, effective cognitive- and behaviour-change strategies.

Limitations and Directions for Future Research

The combined results of the studies comprised in this program of research reveal important limitation and offer several suggestions for future research endeavours related to the validity of an extended TPB framework in the context of adolescent gambling. While many limitations and future directions that characterize the present program of research were noted in each of the individual manuscripts, there are additional overarching limitations and directions for future research that warrant mention.

One important limitation concerns the sample characteristics included in both studies. Specifically, the participant samples consisted equally of non-gamblers and gamblers who reported infrequent gambling activity. Also, of the sample participants that reported gambling in Study 1, none were classified as problem gamblers (4+ symptoms endorsed on DSM-IV-MR-J).[5]

[5] Although level of problem gambling severity was not established in Study 2, it can be expected that the sample was not comprised of problem gamblers since gambling frequency and problem gambling symptoms are generally found to be highly associated among adolescents.

At issue, the gambling literature suggests that the TPB explains the frequency of gambling behaviour differentially between non-problem and problem gamblers (Martin et al., 2011), and that school-based problem gambling prevention programs have a greater impact on students most in need (Turner, Macdonald, & Somerset, 2008), such as high frequency gamblers and adolescents at risk-for developing gambling problems. Thus, the results of the current program of research may not generalize to other populations of adolescent gamblers. Future research should explore differences among lower vs. higher frequency gamblers and problem vs. non-problem gamblers when investigating the applicability of an extended TPB framework for understanding adolescent gambling and for developing school-based problem gambling prevention programs.

In relation to the previous limitation, the present research was also restricted because results were generated from convenience samples. Study 1 surveyed adolescents from two public and one private institution, while Study 2 tested the efficacy of the preventive intervention at a single public institution in the greater Montreal, Canada area. As such, it is difficult to ascertain how well these results would generalize to all high school students, or even high-risk students, given an insufficient number of comparison groups. Further, given the nature of the sample, the findings might not be representative of all adolescents in Canada, much less other countries. To improve the results' generalizability, future studies are needed to replicate the current findings in other jurisdictions and with a wider sample of adolescents (e.g., high-risk students, adolescents in youth residential or treatment facilities).

A further important limitation of the current program of research relates to the nature of the data used to examine the validity of an extended TPB framework in the context of adolescent gambling. The purpose of Study 1 was to expand on previous work and validate an extended TPB framework, which includes NAE, for understanding adolescent gambling decision-making

and behaviour. This line of inquiry was initiated in order to provide the necessary foundation for future investigation of the utility of the framework in the design and evaluation of school-based problem gambling prevention initiatives. However, the cross-sectional and correlational nature of the data do not allow for firm conclusions about the developmental processes of intention formation, initiation of gambling behaviour, and/or onset of gambling problems. For example, it remains unclear how current attitudes, social norms, perceptions of control, anticipated affective reactions, and intentions drive future gambling behaviour or influence future gambling problems. This information is critical for translating research into practice, as it allows for determining the essential targets of intervention in school-based problem gambling prevention programs. Future research investigating prospective links between TPB components, NAE, and the development of gambling behaviours and problems is therefore recommended.

Conclusion

The TPB has been a major theoretical approach used to guide adolescent health behaviour research, including research aimed at the formulation of effective behaviour-change interventions for adolescent risky and addictive behaviours. Despite increased attention to the TPB and its related construct of NAE in the gambling and prevention literature, there is a paucity of research investigating the utility of an extended TPB model (which includes NAE) in the context of adolescent gambling behaviour and in the prevention of adolescent gambling problem. This situation is disconcerting since adolescent gambling problems continue to be a public health concern, and given the clear need for development of school-based problem gambling prevention initiatives utilizing innovative theoretical models in order to improve the likelihood of sustained, successful outcomes (Williams et al., 2010). The current program of research sought to make a novel contribution to the literature by validating this paradigm as a comprehensive model of

adolescent gambling behaviour and as a guiding framework for school-based problem gambling prevention initiatives. Findings suggest that the extended TPB is a suitable framework for describing the rational, cognitive processes involved in adolescent gambling intention formation and, to some extent, adolescent gambling frequency. However, the combined results from this research also offer new evidence that further elaboration of the extended TPB framework is needed for understanding gambling behaviour and for formulating effective prevention initiatives. Given that adolescent problem gambling remains a significant global public health concern, future research in in this area is critical, as it will serve to increase our understanding of the importance of various cognitive and heuristic elements in the context of adolescent gambling and problem gambling prevention practice.

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Appendix A

Parental Consent Form, Study 1

International Centre for Youth Gambling Problems and High-Risk Behaviors
3724 McTavish Street, Montreal, Quebec, Canada H3A 1Y2
Tel: 514-398-1391 Fax: 514-398-3401 www.youthgambling.com

Title of research project :
Anticipated Regret and the Theory of Planned Behaviour in the Prevention of Youth Problem Gambling

Principal Investigator:
Ms. Renée St-Pierre, M.A., Ph.D. student
Department of Educational and Counselling Psychology, Faculty of Education, McGill University

Co-Investigators
Mr. Jeffrey Derevensky, Ph.D., Co-director
International Centre for Youth Gambling Problems and High-Risk Behaviors
Ms. Rina Gupta, Ph.D., Co-director
International Centre for Youth Gambling Problems and High-Risk Behaviors
Ms. Caroline Temcheff, Ph.D., Assistant Professor
Département de psychoéducation, Faculté d'éducation, Université de Sherbrooke

Introduction

It is important to carefully read and understand this consent form for the research we are asking your child to participate in. Take the time you need in order to make your decision. Do not hesitate at any moment to ask any questions that you may have. Your child can decide at anytime to withdraw his/her participation in this research study, without any form of reproach or consequence.

Project description

Your child is invited to participate in a project whose main objective is to evaluate the effectiveness of the *Clean Break/ Les jeux sont faits* prevention video designed to educate and sensitize adolescents to the potential risks and consequences associated with excessive gambling. Considering that gambling is becoming more popular among youth and young adults, your child's participation is extremely valuable for the development of better educational and prevention programs.

Nature of participation

Individuals who participate in this research will be given a pre-intervention questionnaire, which will take approximately 10–20 minutes of class time to complete. All students in the classroom will then view the prevention video for 25–45 minutes. Immediately afterwards, a second questionnaire needing approximately 10 minutes of the remaining class time to complete will be given to individuals who participate in this study. Finally, a follow-up questionnaire will be given during another class period, approximately 3 months after having watched the video. This questionnaire will take approximately 10–20 minutes to complete. Once the study is completed, a brief period will be devoted to explaining the study and answering questions. Please note that only those students who obtain their parents' consent and agree to participate in this research will be allowed to take part in the evaluation of the video and complete the questionnaires. Also note that some students will only view the prevention video once the research is completed; these students will instead proceed with their regular academic activities with the teacher for 25 minutes of class time after completing the pre-intervention questionnaire.

Possible risks and discomforts

There are no foreseeable risks or discomforts in participating in this research study. The prevention video was developed to portray excessive gambling in a non-judgemental manner. As well, results from previous research show that the video is both appealing to and appropriate for adolescents.

Dissemination of results

The results of this project will be disseminated in many different ways, such as during conferences or in journal articles and other forms of publications. Conferences will be given in diverse regions of Québec in order to inform different professional groups, such as teachers and school administrators, of the results of the study. Under no circumstances will your child's name or identity appear anywhere.

Confidentiality

All of the information gathered for this research project will be treated in a confidential manner. In order to protect your child's identity, he/she will be given an identification number for coding purposes. Your child will only be asked to provide his/her date of birth, mother's surname, and last two digits of his/her telephone number to match up the questionnaires; no other identifying information will need to be provided. The data and consent forms will only be available to the primary and co-investigators. However, it is possible that we will be required to share this research dossier with McGill officials (Ethics Committee) for internal and monitoring purposes.

Compensation

Your child will be entered in a raffle for one of ten $20 cinema gift certificates to compensate him/her for his/her participation in this study. Winners will be drawn at random once the study is completed. Additionally, a free lunch (pizza) will be provided to all students in participating classrooms.

Contact person

If you have any questions, comments or complaints, or if would like more information about this study, please contact Ms. Renée St-Pierre at (514) 398-6830 or renee.st-pierre@mail.mcgill.ca. If you have any questions or concerns about your child's rights or welfare as a participant in this research study, please contact the Research Ethics Officer at 514-398-6831 or lynda.mcneil@mcgill.ca.

Freedom of participation and withdrawal

Your child's participation in this study is completely voluntary. Your child is therefore free to accept or not accept to participate, without needing to give a reason or risk being judged. Your child is also free to withdraw his/her participation at any moment, and may also refuse to answer any question. A decision to participate or not participate will not affect the availability of the prevention program offered.

Terms of consent

I have read and understood the content of this consent form. I have had the opportunity to ask questions and they were answered to my satisfaction. I know that my child is free to participate in this study and is able to withdraw at any moment, by a verbal expression, without prejudice. I am also aware that a decision to participate or not participate will not affect the availability of the prevention program offered. I can certify that I was given enough time to make my decision.

Please indicate whether you agree to have your child participate by completing the following and returning it to the school:

I agree to allow my son/daughter _____ to participate in this research study. I have been informed that he/she is free to withdraw this consent and discontinue participation in this project at any time without further implications. I have also been informed that a decision to participate or not participate will not affect the availability of the prevention program offered.

Parent's Name _____ Date: _____

Parent's Signature _____

This form will be entered in our research dossier. This research study and consent form have been approved by McGill University's Ethics Committee.

Appendix B

Student Assent Form, Study 1

International Centre for Youth Gambling Problems and High-Risk Behaviors
3724 McTavish Street, Montreal, Quebec, Canada H3A 1Y2
Tel: 514-398-1391 Fax: 514-398-3401 www.youthgambling.com

Title of research project :
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Department of Educational and Counselling Psychology, Faculty of Education, McGill University

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Mr. Jeffrey Derevensky, Ph.D., Co-director
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Ms. Rina Gupta, Ph.D., Co-director
International Centre for Youth Gambling Problems and High-Risk Behaviors
Ms. Caroline Temcheff, Ph.D., Assistant Professor
Département de psychoéducation, Faculté d'éducation, Université de Sherbrooke

Introduction

It is important to carefully read and understand this consent form for the research we are asking you to participate in. Take the time you need in order to make your decision. Do not hesitate at any moment to ask any questions that you may have. You can decide at anytime to withdraw your participation in this research study, without any form of reproach or consequence.

Project description

You are invited to participate in a project whose main objective is to evaluate the effectiveness of the *Clean Break/ Les jeux sont faits* prevention video designed to teach and sensitize adolescents about the potential risks and consequences associated with gambling excessively. Considering that gambling is becoming more popular among youth and young adults, your participation in this study is extremely valuable because it will allow us to develop better educational and prevention programs. Even if you don't gamble at all, your participation would be a great help to us.

Nature of participation

If you agree to participate in this research, you will be given a first questionnaire, which will take approximately 10–20 minutes of class time to fill out. All students in the classroom will then watch the prevention video for 25–45 minutes. Immediately afterwards, a second questionnaire needing approximately 10 minutes of the remaining class time to fill out will be given to you. Finally, a follow-up questionnaire will be given to during another class period, approximately 3 months after having watched the video. This questionnaire will take approximately 10–20 minutes to fill out. Once the study is finished, a short period will be offered to explain the study and answer questions. Only students who obtain their parents' permission and agree to participate in this research will be allowed to complete the questionnaires. Also, some students will only view the prevention video once the research is completed; these students will instead carry on with their regular school activities with the teacher for 25 minutes after completing the first questionnaire.

Possible risks and discomforts

There are no foreseeable risks or discomforts in participating in this research study. The prevention video was developed to show excessive gambling in a non-judgemental way. As well, previous research reveals that adolescents find the video both appealing and appropriate.

Confidentiality

All of the information is confidential and anonymous; you will only be asked to give your birth date, mother's surname, and last two digits of your telephone number to help us match up the questionnaires. You will be given an ID number so that there will be no way to identify you or any other participant.The questionnaires and consent/assent forms will only be available to the primary and co-investigators.

Compensation

You will be entered in a raffle for one of ten $20 cinema gift certificates to compensate you for your participation in this study. Winners will be drawn at random once the study is completed. Additionally, a free lunch (pizza) will be provided to all students in participating classrooms.

Contact person

If you have any questions, comments or complaints, or if would like more information about this study, you can contact Ms. Renée St-Pierre at (514) 398-6830 or renee.st-pierre@mail.mcgill.ca. If you have any questions or concerns about your rights or wellbeing as a participant in this research study, please contact the Research Ethics Officer at 514-398-6831 or lynda.mcneil@mcgill.ca.

Freedom of participation and withdrawal

Your participation in this study is completely voluntary; you are free to accept or not accept to participate, without needing to give a reason or risk being judged. If for any reason you no longer wish to participate once you have begun, you can end your participation at any time. You are also allowed to refuse to answer any question. Your decision to participate or not participate will not affect your chance to watch the video.

Terms of assent

I have read and understood this assent form. I have had the chance to ask questions and they were answered to my liking. I know that I am free to participate in this study and that I am able to end my participation at any time without needing to give a reason or risk being judged. I am also aware that my decision to participate or not participate will not affect my chance to watch the video. I can confirm that I was given enough time to make my decision.

Please indicate whether you agree to participate by completing the following:

I, _____ agree to participate in this research project. I understand that I am free to withdraw this agreement and discontinue participation in this project at any time without further implications. I also understand that my decision to participate or not participate will not affect my chance to watch the video.

Student's Name _____ Date: _____

Student's Signature _____

This form will be entered in our research dossier. This research study and consent form have been approved by McGill University's Ethics Committee.

Appendix C

Parental Consent Form, Study 2

UNIVERSITÉ DE SHERBROOKE

McGill

Title of research project :
Thinking before doing: Evaluation of school-based prevention programs for youth problem gambling
Funded by the Social Science and Humanities Research Council of Canada (SSHRC)

Principal Investigators:
Ms. Caroline Temcheff, Ph.D., Assistant Professor
Département de psychoéducation, Faculté d'éducation, Université de Sherbrooke
Tel : 1-800-267-8337 ext. 63341; courriel: Caroline.Temcheff@USherbrooke.ca
Mr. Jeffrey Derevensky, Ph. D, Co-director
International Centre for Youth Gambling Problems and High-Risk Behaviors

Co-Investigators (Ph.D. Student):
Ms. Renée St-Pierre, Ph.D. candidate
Department of Educational and Counselling Psychology, Faculty of Education, McGill University

Introduction

It is important to carefully read and understand this consent form for the research we are asking your child to participate in. Take the time you need in order to make your decision. Do not hesitate at any moment to ask any questions that you may have.

Project description

Your child is invited to participate in a project whose main objective is to evaluate and compare the effectiveness of gambling prevention tools designed to educate and sensitize adolescents to the potential risks and consequences associated with excessive gambling. Considering that gambling is becoming more popular among youth and young adults, your child's participation is extremely valuable for the development of better educational and prevention programs.

Nature of participation

Individuals who participate in this research will be given a pre-intervention questionnaire, which will take approximately 10 minutes of class time to complete. All students in the classroom will then engage in a prevention exercise led by trained mental health professionals for 30-45 minutes. Approximately one week later, a 30 minute group discussion, followed by a post-intervention questionnaire needing approximately 5 minutes of class time to complete, will be given to individuals who participate in this study. Finally, a follow-up questionnaire will be given during another class period, approximately 3 months post-intervention. This follow-up questionnaire will take approximately 10 minutes to complete. Once the study is completed, a brief period will be devoted to explaining the study and answering student questions. Please note that only those students who obtain their parents' consent and agree to participate in this research will be allowed to complete the questionnaires. Also note that some students will only view the prevention video once the research is completed; these students will instead proceed with their regular academic activities with the teacher for 45 minutes of class time after completing the pre-intervention questionnaire.

Possible risks and discomforts

There are no foreseeable risks or discomforts in participating in this research study. The prevention materials have been developed to portray excessive gambling in a non-judgemental manner.

Dissemination of results

The results of this project will be disseminated in many different ways, such as during conferences or in journal articles and other forms of publications. Conferences will be given in diverse regions of Quebec in order to inform different professional groups, such as teachers and school administrators, of the results of the study. Under no circumstances will your child's name or identity appear anywhere.

Confidentiality

All of the information gathered for this research project will be treated in a confidential manner. In order to protect your child's identity, he/she will be given an identification number for coding purposes. Your child will only be asked to provide his/her date of birth, mother's surname, and last two digits of his/her telephone number to match up the questionnaires; no other identifying information will need to be provided. The data and consent forms will only be available to the primary and co-investigators. However, it is possible that we will be required to share this research dossier with McGill officials (Ethics Committee) for internal and monitoring purposes.

Compensation

Your child will be entered in a raffle for one of ten $20 cinema gift certificates to compensate him/her for his/her participation in this study. Winners will be drawn at random once the study is completed. A free pizza lunch will also be provided following completion of the study.

Contact person

If you have any questions, comments or complaints, or if would like more information about this study, please contact Dr. Caroline Temcheff at 1-800-267-8337 ext. 63341 or Caroline.Temcheff@USherbrooke.ca. If you have any questions or concerns about your child's rights or welfare as a participant in this research study, please contact the Research Ethics Officer Serge Striganuk at 1-800-267-8337 ext. 61667 or Serge.Striganuk@USherbrooke.ca.

Freedom of participation and withdrawal

Your child's participation in this study is completely voluntary. Your child is therefore free to accept or not accept to participate, without needing to give a reason or risk being judged. Your child is also free to withdraw his/her participation at any moment, and may also refuse to answer any question. A decision to participate or not participate will not affect the availability of the prevention programs offered.

Terms of consent

I have read and understood the content of this consent form. I have had the opportunity to ask questions and they were answered to my satisfaction. I know that my child is free to participate in this study and is able to withdraw at any moment, by a verbal expression, without prejudice. I am also aware that a decision to participate or not participate will not affect the availability of the prevention programs offered. I can certify that I was given enough time to make my decision.

Please indicate whether you agree to have your child participate by completing the following and returning it to the school:

I agree to allow my son/daughter _____to participate in this research study. I have been informed that he/she is free to withdraw this consent and discontinue participation in this project at any time without further implications. I have also been informed that a decision to participate or not participate will not affect the availability of the prevention programs offered.

Parent's Name _____ Date: _____

Parent's Signature _____

Principal Investigator's Signature C Temcheff _____

This form will be entered in our research dossier. This research study and consent form have been approved by McGill University's and Université de Sherbrooke's respective Ethics Committees. ***Please sign both copies of this form, return one copy to the principal investigator, and keep the second copy for your records***.

Appendix D

Student Assent Form, Study 2

UNIVERSITÉ DE SHERBROOKE

McGill

Title of research project :
Thinking before doing: Evaluation of school-based prevention programs for youth problem gambling
Funded by the Social Science and Humanities Research Council of Canada (SSHRC)

Principal Investigators:
Ms. Caroline Temcheff, Ph.D., Assistant Professor
Département de psychoéducation, Faculté d'éducation, Université de Sherbrooke
Tel : 1-800-267-8337 ext. 63341; courriel: Caroline.Temcheff@USherbrooke.ca
Mr. Jeffrey Derevensky, Ph. D, Co-director
International Centre for Youth Gambling Problems and High-Risk Behaviors

Co-Investigators (Ph.D. Student):
Ms. Renée St-Pierre, Ph.D. candidate
Department of Educational and Counselling Psychology, Faculty of Education, McGill University

Introduction

It is important to carefully read and understand this consent form for the research we are asking you to participate in. Take the time you need in order to make your decision. Do not hesitate at any moment to ask any questions that you may have. You can decide at anytime to withdraw your participation in this research study, without any form of reproach or consequence.

Project description

You are invited to participate in a project whose main objective is to evaluate and compare the effectiveness of gambling prevention tools designed to educate and sensitize adolescents to the potential risks and consequences associated with excessive gambling. Considering that gambling is becoming more popular among youth and young adults, your participation in this study is extremely valuable because it will allow us to develop better educational and prevention programs. Even if you don't gamble at all, your participation would be a great help to us.

Nature of participation

If you agree to participate in this research, you will be given a first questionnaire, which will take approximately 10–15 minutes of class time to complete. All students in the classroom will then take part in a prevention exercise for 45 minutes. Approximately one week later, a second questionnaire needing approximately 5–10 minutes of class time to complete will be given to you. Finally, a third questionnaire will be given to you during another class period, approximately 3 months post-intervention. This follow-up questionnaire will take approximately 10–15 minutes to complete. Once the study is finished, a short period will be offered to explain the study and answer questions. Only students who obtain their parents' permission and agree to participate in this research will be allowed to complete the questionnaires. Also, some students will only view the prevention video once the research is completed; these students will instead carry on with their regular school activities with the teacher for 45 minutes after completing the first questionnaire.

Possible risks and discomforts

There are no foreseeable risks or discomforts in participating in this research study. The prevention materials have been developed to show excessive gambling in a non-judgemental way.

Confidentiality

All of the information is confidential and anonymous; you will only be asked to give your birth date, mother's surname, and last two digits of your telephone number to help us match up the questionnaires. You will be given an ID number so that there will be no way to identify you or any other participant.The questionnaires and consent/assent forms will only be available to the primary and co-investigators.

Compensation

You will be entered in a raffle for one of ten $20 cinema gift certificates to compensate you for your participation in this study. Winners will be drawn at random once the study is completed.

Contact person

If you have any questions, comments or complaints, or if would like more information about this study, please contact Dr. Caroline Temcheff at (819) 821-8000 ext 63341 or caroline.temcheff@usherbrooke.ca. If you have any questions or concerns about your child's rights or welfare as a participant in this research study, please contact the Research Ethics Officer at 514-398-6831 or lynda.mcneil@mcgill.ca.

Freedom of participation and withdrawal

Your participation in this study is completely voluntary; you are free to accept or not accept to participate, without needing to give a reason or risk being judged. If for any reason you no longer wish to participate once you have begun, you can end your participation at any time. You are also allowed to refuse to answer any question. Your decision to participate or not participate will not affect your chance to participate in the prevention programs.

Terms of assent

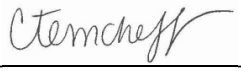
I have read and understood this assent form. I have had the chance to ask questions and they were answered to my liking. I know that I am free to participate in this study and that I am able to end my participation at any time without needing to give a reason or risk being judged. I am also aware that my decision to participate or not participate will not affect my participate in the prevention programs. I can confirm that I was given enough time to make my decision.

Please indicate whether you agree to participate by completing the following:

I, _____ agree to participate in this research project. I understand that I am free to withdraw this agreement and discontinue participation in this project at any time without further implications. I also understand that my decision to participate or not participate will not affect my chance to participate in the prevention programs.

Student's Name _____ Date: _____

Student's Signature _____

Principal Investigator's Signature  _____

This form will be entered in our research dossier. This research study and consent form have been approved by McGill University's and Université de Sherbrooke's respective Ethics Committees. ***Please sign both copies of this form, return one copy to the principal investigator, and keep the second copy for your records***.

Appendix E

Questionnaire Time 1 and 3, Study 1

The following questionnaire refers to your ideas and beliefs about gambling, as well as your gambling behaviours. For each statement, please indicate your response by filling in the circle under the statement that you agree with. All information is confidential and anonymous, and only our research team at McGill University will have access to this information. We only require that you provide your date of birth, your mother's maiden name, and the last two digits of your telephone number so that we can match this questionnaire to later questionnaires. It is not necessary to provide us any other identifying information, so please do not indicate your name on this questionnaire. The entire questionnaire should take approximately 10-20 minutes to complete.

For each question, please fill in the marks like this: ● **<u>NOT</u> like this: ⊗ ◴ ⊘**

Section 1

1. Gender:

Male ○ Female ○

2. Age:

12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ Other ○ Please specify: _____

3. Grade:

7 (Sec.1) ○ 8 (Sec.2) ○ 9 (Sec.3) ○ 10 (Sec.4) ○ 11 (Sec.5) ○ CEGEP ○

4. Cultural/ethnic background (you can select more than one answer):

○ French	○ Greek	○ Korean
○ English	○ Arabic	○ Polish
○ Spanish	○ Hindi	○ Dutch
○ Portuguese	○ Chinese	○ Russian
○ Italian	○ Japanese	○ First Nations
○ Hebrew	○ Vietnamese	○ Other: Please specify: _____

_____

_____

NOTE: *The next sections are about gambling. By* ***<u>gambling</u>****, we mean when you* ***bet or risk money or something of value*** *so that you can win or gain money or something else of value. Some examples of gambling activities include: lottery, cards, sports pools or wagers, bingo, slot machines, video lottery terminals (VLTs), casino-type games, games of skills, etc.*

Section 2

ATTITUDES

This section of the questionnaire has sentences that describe what some people may think or believe about gambling. There are no right or wrong answers. Even if you do not gamble, select the answer that tells what you think or believe about gambling.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
5.	Gambling is a fun activity	○	○	○	○	○
6.	Gambling from time to time is harmless	○	○	○	○	○
7.	Gamblers need help from a counsellor or psychologist	○	○	○	○	○
8.	Gambling should be illegal	○	○	○	○	○
9.	There is too much gambling today	○	○	○	○	○
10.	Gambling destroys families	○	○	○	○	○
11.	Gambling is just another way to pass the time	○	○	○	○	○
12.	Most people can control their gambling	○	○	○	○	○
13.	Gambling is bad for society	○	○	○	○	○
14.	I think some gambling should be legal	○	○	○	○	○
15.	Gambling should be controlled by law so people don't overdo it	○	○	○	○	○
16.	Basically I approve of gambling and believe it is okay	○	○	○	○	○

Section 3

PERCEIVED FAMILY AND PEER NORMS

This section of the questionnaire has sentences that describe how some people imagine what their family and friends think about gambling. There are no right or wrong answers. Select the answer that tells what you believe your family and friends think about gambling.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
17.	Most of my friends approve of gambling and believe it is okay	○	○	○	○	○
18.	Most of my friends gamble sometimes	○	○	○	○	○
19.	My friends often get together to gamble (for example, to play cards for money) or go out to places where they can gamble	○	○	○	○	○
20.	Generally, I try to fit in with what my friends want	○	○	○	○	○
21.	My family approves of gambling and believes it is okay	○	○	○	○	○
22.	People in my family gamble sometimes	○	○	○	○	○
23.	People in my family often go to places where they can gamble	○	○	○	○	○
24.	My family members spend $20 or more per week on gambling	○	○	○	○	○
25.	My family members spend $100 or more per week on gambling	○	○	○	○	○
26.	Generally, I try to fit in with what my family wants	○	○	○	○	○
27.	My friends would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○
28.	My family would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○
29.	My friends would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○
30.	My family would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○

Section 4

PERCEIVED CONTROL

This section of the questionnaire has sentences that describe how some people feel about their ability and skills to "say no" or refuse to gamble in different situations. There are no right or wrong answers. Select the answer that tells how capable you believe you would be to refuse to gamble in these situations.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Agree	Strongly agree
31.	I am confident I would be able control myself not to gamble if I tried hard enough	○	○	○	○
32.	Even if someone would disagree or argue with me, I think I would be able to find a way to resist gambling	○	○	○	○
33.	I believe it would be easy for me to stick to my goal of not gambling	○	○	○	○
34.	I am confident that I would be able to resist gambling in spite of peer pressure	○	○	○	○
35.	I think my intelligence would help me to resist gambling in spite of peer pressure	○	○	○	○
36.	I am confident I would be able to solve most problems related to controlling my gambling or refusing to gamble if I made enough efforts	○	○	○	○
37.	Since I believe in my ability and skills, I think I would be able stay calm when facing difficulties related to controlling my gambling or refusing to gamble	○	○	○	○
38.	If I would face a problem related to controlling my gambling or refusing to gamble, I believe I would be able to think of several alternatives or solutions	○	○	○	○
39.	I am confident that I would be able think of a way out even if I was in a difficult situation where I was trying to resist gambling	○	○	○	○
40.	No matter what would happen to me, I think I would be able to say no to gambling	○	○	○	○

Section 5

ANTICIPATED EMOTIONS

This section of the questionnaire has sentences that deal with expected feelings after having gambled. There are no right or wrong answers. Even if you do not gamble, answer the questions as you would imagine you would feel afterwards if you chose to gamble.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
41.	If in the next month I started gambling or I gambled, I would regret it afterwards	○	○	○	○	○
42.	I would be worried if I gambled more money than I had intended to	○	○	○	○	○
43.	If in the next month I started gambling or gambled, I would feel upset afterwards	○	○	○	○	○
44.	I would regret it if I gambled more money than I had intended to	○	○	○	○	○
45.	If in the next month I started gambling or gambled, I would worry afterwards	○	○	○	○	○
46.	I would feel upset if I gambled more money than I had intended to	○	○	○	○	○

Section 6

INTENTIONS

This section of the questionnaire has sentences that deal with intentions to gamble in the future. There are no right or wrong answers. Even if you do not gamble at this time, please select the answer that tells what your intentions are to gamble in the future.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

	IN THE NEXT MONTH, I INTEND TO...	**Strongly disagree**	**Disagree**	**Not sure/ Neither agree nor disagree**	**Agree**	**Strongly agree**
47.	... play electronic gaming machines or slot machines (e.g., video lottery terminal, video poker)	○	○	○	○	○
48.	... buy a lottery or an instant-win/scratch ticket	○	○	○	○	○
49.	... bet on sports for money (e.g., sports cards, football pools, fantasy leagues, etc.)	○	○	○	○	○
50.	... play cards for money (poker, black jack, etc.)	○	○	○	○	○
51.	... gamble in some way	○	○	○	○	○
52.	... spend $20 or more on gambling	○	○	○	○	○
53.	... spend $100 or more on gambling	○	○	○	○	○

Section 7

GAMBLING HABITS

The following section of the questionnaire asks about gambling habits and behaviour. Certain questions may not apply to you, but all participants must be asked and answer the same questions.

ALL PARTICIPANTS ANSWER THESE QUESTIONS. PLEASE PROVIDE A RESPONSE FOR EACH ITEM.

IN THE LAST 3 MONTHS...

54. How often did you bet or gamble money or something of value in the following activities and approximately how much time per week did you spend on each one?

	***PART A*: In the last 3 months, how often have you gambled or bet on each of the activities listed below? <u>PLEASE PROVIDE ONE RESPONSE FOR EACH ITEM/ACTIVITY.</u>**	Not in the past 3 months	About once/ month	2-3 times/ month	About once/ week	2-6 times/ week	Daily	***PART B*: In the last 3 months, about how much time did you spend on this activity in a typical week (hours: minutes)?** Hours	Minutes
a.	Internet (for money) Poker	○	○	○	○	○	○	☐☐ :	☐☐
	Slot machine	○	○	○	○	○	○	☐☐ :	☐☐
	Other _____	○	○	○	○	○	○	☐☐ :	☐☐
<u>The following activities do not include internet</u>									
b.	Lottery tickets (e.g., 6/49, Lotto Max)	○	○	○	○	○	○	☐☐ :	☐☐
c.	Instant-win or scratch tickets (e.g., Loto-bingo, Les 7 chanceux, Mots-cachés, etc.)	○	○	○	○	○	○	☐☐ :	☐☐
d.	Raffle or fundraising tickets	○	○	○	○	○	○	☐☐ :	☐☐
e.	Blotzito	○	○	○	○	○	○	☐☐ :	☐☐

		Not in the past 3 months	About once/ month	2-3 times/ month	About once/ week	2-6 times/ week	Daily	Hours	Minutes
f.	Cards for money (poker, black jack, etc.)	○	○	○	○	○	○	☐☐:☐☐	
g.	Board or dice games (for money)	○	○	○	○	○	○	☐☐:☐☐	
h.	Video lottery terminals	○	○	○	○	○	○	☐☐:☐☐	
i.	Slot machines at casinos or racetracks/hippodrome	○	○	○	○	○	○	☐☐:☐☐	
j.	Arcade or video games (for money or something of value)	○	○	○	○	○	○	☐☐:☐☐	
k.	Sports betting (e.g., Mise-O-Jeu, Pronostik, Total, etc.)	○	○	○	○	○	○	☐☐:☐☐	
l.	Sports pools or games (e.g., hockey, basketball, etc.)	○	○	○	○	○	○	☐☐:☐☐	
m.	Sports betting through a bookie (i.e., someone who accepts and pays off bets)	○	○	○	○	○	○	☐☐:☐☐	
n.	Horse race (i.e., live at track and/or off-track)	○	○	○	○	○	○	☐☐:☐☐	
o.	Table games at casinos (e.g., poker, black jack, roulette, etc.)	○	○	○	○	○	○	☐☐:☐☐	
p.	Your or someone else's performance in games of skill (e.g., pool, golf, bowling, darts) or other activities (e.g., sports, school, etc.)	○	○	○	○	○	○	☐☐:☐☐	
q.	A dare or challenge that you or someone else can do something	○	○	○	○	○	○	☐☐:☐☐	
r.	Bingo (for money or something else of value)	○	○	○	○	○	○	☐☐:☐☐	
s.	Any other form of gambling/betting Please specify: _____	○	○	○	○	○	○	☐☐:☐☐	

NOTE: **IF YOU HAVE NEVER GAMBLED OR ANSWERED "NOT IN THE PAST 3 MONTHS" FOR EACH OF THE ABOVE ACTIVITIES, PLEASE SKIP THE REST OF THIS QUESTIONNAIRE.**

IF YOU HAVE GAMBLED ON ONE OR MORE OF THE ABOVE ACTIVITIES, PLEASE CONTINUE THIS SECTION.

55.	**DURING THE LAST 3 MONTHS...**	
a.	How much money in total did you lose on gambling/betting? If you did not lose any money, enter "0" (in dollars)	$☐☐☐☐, 00
b.	Did you lose something of value on gambling/betting? If yes, write down its value (in dollars) and specify what it was (if more than one, calculate the total value) Please specify: _____	$☐☐☐☐, 00

Section 8

DSM-IV-MR-J

ANSWER THESE QUESTIONS ONLY IF YOU HAVE GAMBLED ON ONE OR MORE ACTIVITIES DURING THE LAST THREE MONTHS

NOTE: *By **gambling**, we mean when you **bet or risk money or something of value** so that you can win or gain money or something else of value. Some examples of gambling activities include: lottery, cards, sports pools or wagers, bingo, slot machines, video lottery terminals (VLTs), casino-type games, games of skills, etc.*

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

Never ○ Once or twice ○ Sometimes ○ Often ○

57. **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 ○

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

Never ○ Once or twice ○ Sometimes ○ Often ○

59. 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	Never tried to cut down
○	○	○	○	○

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

Never	Once or twice	Sometimes	Often
○	○	○	○

61. 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	Often
○	○	○	○

62. In the past year, has your gambling ever led to:

		Never	Once or twice	Sometimes	Often
a.	Lies to your family?	○	○	○	○
b.	Arguments with family/friends or others?	○	○	○	○
c.	Missing school?	○	○	○	○

63. In the past year, have you ever taken money from the following <u>without permission</u> to spend on gambling:

		Never	Once or twice	Sometimes	Often
a.	School dinner money or fare money?	○	○	○	○
b.	Money from your family?	○	○	○	○
c.	Money from outside the family	○	○	○	○

Thank you for taking the time to fill this out!

INFORMATION FOR MATCHING QUESTIONNAIRES

NOTE: Please provide us with your birth date, your mother's surname, and the last two digits of your telephone number to help us match up this questionnaire to later questionnaires you will be asked to fill out.

Once questionnaires are matched, you will be given an ID number. This form will then be detached and stored separately from the questionnaires to ensure the anonymity of questionnaire responses.

Date of birth:

☐☐☐☐ - ☐☐ - ☐☐
Year Month Day

Mother's surname:

_____

Last two digits of telephone number:

☐☐

The International Centre for Youth Gambling Problems & High-Risk Behaviors is also interested in contacting students at a later date to have them participate in a follow-up survey. If you are interested in participating in this follow-up survey, please provide your e-mail address below so that we may contact you in the future.

E-mail: _____

Appendix F

Questionnaire Time 2, Study 1

The following questionnaire deals with your ideas and beliefs about gambling. For each statement, please indicate your response by filling in the circle under the statement that you agree with. All information is confidential and anonymous, and only our research team at McGill University will have access to this information. We only require that you provide your date of birth, your mother's maiden name, and the last two digits of your telephone number so that we can match this questionnaire to later questionnaires. It is not necessary to provide us any other identifying information, so please do not indicate your name on this questionnaire. The entire questionnaire should take approximately 10 minutes to complete.

NOTE: *The next sections are about gambling. By* ***gambling****, we mean when you* ***bet or risk money or something of value*** *so that you can win or gain money or something else of value. Some examples of gambling activities include: lottery, cards, sports pools or wagers, bingo, slot machines, video lottery terminals (VLTs), casino-type games, games of skills, etc.*

For each question, please fill in the marks like this: ● **NOT like this: ⊗ ◪ ⊘**

Section 1

ATTITUDES

This section of the questionnaire has sentences that describe what some people may think or believe about gambling. There are no right or wrong answers. Even if you do not gamble, select the answer that tells what you think or believe about gambling.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
1.	Gambling is a fun activity	○	○	○	○	○
2.	Gambling from time to time is harmless	○	○	○	○	○
3.	Gamblers need help from a counsellor or psychologist	○	○	○	○	○
4.	Gambling should be illegal	○	○	○	○	○
5.	There is too much gambling today	○	○	○	○	○
6.	Gambling destroys families	○	○	○	○	○
7.	Gambling is just another way to pass the time	○	○	○	○	○

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
8.	Most people can control their gambling	○	○	○	○	○
9.	Gambling is bad for society	○	○	○	○	○
10.	I think some gambling should be legal	○	○	○	○	○
11.	Gambling should be controlled by law so people don't overdo it	○	○	○	○	○
12.	Basically I approve of gambling and believe it is okay	○	○	○	○	○

Section 2

PERCEIVED FAMILY AND PEER NORMS

This section of the questionnaire has sentences that describe how some people imagine what their family and friends think about gambling. There are no right or wrong answers. Select the answer that tells what you believe your family and friends think about gambling.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
13.	Most of my friends approve of gambling and believe it is okay	○	○	○	○	○
14.	Most of my friends gamble sometimes	○	○	○	○	○
15.	My friends often get together to gamble (for example, to play cards for money) or go out to places where they can gamble	○	○	○	○	○
16.	Generally, I try to fit in with what my friends want	○	○	○	○	○
17.	My family approves of gambling and believes it is okay	○	○	○	○	○
18.	People in my family gamble sometimes	○	○	○	○	○
19.	People in my family often go to places where they can gamble	○	○	○	○	○
20.	My family members spend $20 or more per week on gambling	○	○	○	○	○

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
21.	My family members spend $100 or more per week on gambling	○	○	○	○	○
22.	Generally, I try to fit in with what my family wants	○	○	○	○	○
23.	My friends would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○
24.	My family would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○
25.	My friends would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○
26.	My family would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○

Section 3

PERCEIVED CONTROL

This section of the questionnaire has sentences that describe how some people feel about their ability and skills to "say no" or refuse to gamble in different situations. There are no right or wrong answers. Select the answer that tells how capable you believe you would be to refuse to gamble in these situations.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Agree	Strongly agree
27.	I am confident I would be able control myself not to gamble if I tried hard enough	○	○	○	○
28.	Even if someone would disagree or argue with me, I think I would be able to find a way to resist gambling	○	○	○	○
29.	I believe it would be easy for me to stick to my goal of not gambling	○	○	○	○
30.	I am confident that I would be able to resist gambling in spite of peer pressure	○	○	○	○
31.	I think my intelligence would help me to resist gambling in spite of peer pressure	○	○	○	○
32.	I am confident I would be able to solve most problems related to controlling my gambling or refusing to gamble if I made enough efforts	○	○	○	○

		Strongly disagree	Disagree	Agree	Strongly agree
33.	Since I believe in my ability and skills, I think I would be able stay calm when facing difficulties related to controlling my gambling or refusing to gamble	○	○	○	○
34.	If I would face a problem related to controlling my gambling or refusing to gamble, I believe I would be able to think of several alternatives or solutions	○	○	○	○
35.	I am confident that I would be able think of a way out even if I was in a difficult situation where I was trying to resist gambling	○	○	○	○
36.	No matter what would happen to me, I think I would be able to say no to gambling	○	○	○	○

Section 4

ANTICIPATED EMOTIONS

This section of the questionnaire has sentences that deal with expected feelings after having gambled. There are no right or wrong answers. Even if you do not gamble, answer the questions as you would imagine you would feel afterwards if you chose to gamble.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
37.	If in the next month I started gambling or I gambled, I would regret it afterwards	○	○	○	○	○
38.	I would be worried if I gambled more money than I had intended to	○	○	○	○	○
39.	If in the next month I started gambling or gambled, I would feel upset afterwards	○	○	○	○	○
40.	I would regret it if I gambled more money than I had intended to	○	○	○	○	○
41.	If in the next month I started gambling or gambled, I would worry afterwards	○	○	○	○	○
42.	I would feel upset if I gambled more money than I had intended to	○	○	○	○	○

Section 5

INTENTIONS

This section of the questionnaire has sentences that deal with intentions to gamble in the future. There are no right or wrong answers. Even if you do not gamble at this time, please select the answer that tells what your intentions are to gamble in the future.

ALL PARTICIPANTS ANSWER THESE QUESTIONS

	IN THE NEXT MONTH, I INTEND TO...	**Strongly disagree**	**Disagree**	**Not sure/ Neither agree nor disagree**	**Agree**	**Strongly agree**
43.	... play electronic gaming machines or slot machines (e.g., video lottery terminal, video poker)	○	○	○	○	○
44.	... buy a lottery or an instant-win/scratch ticket	○	○	○	○	○
45.	... bet on sports for money (e.g., sports cards, football pools, fantasy leagues, etc.)	○	○	○	○	○
46.	... play cards for money (poker, black jack, etc.)	○	○	○	○	○
47.	... gamble in some way	○	○	○	○	○
48.	... spend $20 or more on gambling	○	○	○	○	○
49.	... spend $100 or more on gambling	○	○	○	○	○

Thank you for taking the time to fill this out!

INFORMATION FOR MATCHING QUESTIONNAIRES

NOTE: Please provide us with your birth date, your mother's surname, and the last two digits of your telephone number to help us match up this questionnaire to later questionnaires you will be asked to fill out.

Once questionnaires are matched, you will be given an ID number. This form will then be detached and stored separately from the questionnaires to ensure the anonymity of questionnaire responses.

Date of birth:

☐☐☐☐ - ☐☐ - ☐☐
Year Month Day

Mother's surname:

_____

Last two digits of telephone number:

☐☐

The International Centre for Youth Gambling Problems & High-Risk Behaviors is also interested in contacting students at a later date to have them participate in a follow-up survey. If you are interested in participating in this follow-up survey, please provide your e-mail address below so that we may contact you in the future.

E-mail: _____

Appendix G

Questionnaire Time 1 and 3, Study 2

GAMBLING refers to when you bet or risk money or something of value so that you can win or gain money or something else of value.
For each statement, please indicate your response by filling in the circle under the statement that you agree with. All information is confidential and anonymous.

For each question, please fill in the marks like this: ● NOT like this: ⊗ ◪ ⊘

A. Gender:

Male ○ Female ○

B. Age:

12 ○ 13 ○ 14 ○ 15 ○ 16 ○ 17 ○ Other ○ Please specify: _____

C. Grade:

7 (Sec.1) ○ 8 (Sec.2) ○ 9 (Sec.3) ○ 10 (Sec.4) ○ 11 (Sec.5) ○

ATTITUDES

This section of the questionnaire has sentences that describe what some people think about gambling. Even if you don't gamble, select the answer that best describes what you think about gambling.

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
1.	Gambling is a fun activity	○	○	○	○	○
2.	Gambling from time to time is harmless	○	○	○	○	○
3.	Gamblers need help from a counsellor or psychologist	○	○	○	○	○
4.	Gambling should be illegal	○	○	○	○	○
5.	There is too much gambling today	○	○	○	○	○
6.	Gambling destroys families	○	○	○	○	○
7.	Gambling is just another way to pass the time	○	○	○	○	○
8.	Most people can control their gambling	○	○	○	○	○
9.	Gambling is bad for society	○	○	○	○	○
10.	I think some gambling should be legal	○	○	○	○	○
11.	Gambling should be controlled by law so people don't overdo it	○	○	○	○	○
12.	Basically I approve of gambling and believe it is okay	○	○	○	○	○

GAMBLING HABITS

The following section asks about gambling habits and behaviour.

PLEASE PROVIDE A RESPONSE FOR EACH ITEM.

In the last 3 months, how often have you gambled or bet on each of the activities listed below?

		Not in the past 3 months	About once/ month	2-3 times/ month	About once/ week	2-6 times/ week	Daily
13.	Any Internet gambling for money	○	○	○	○	○	○
14.	Lottery tickets (e.g., 6/49, Lotto Max) or scratch tickets (e.g., Loto-bingo, Les 7 chanceux, Mots-cachés, etc.)	○	○	○	○	○	○
15.	Cards for money (poker, black jack, etc.)	○	○	○	○	○	○
16.	Video lottery terminals or slot machines	○	○	○	○	○	○
17.	Arcade or video games (for money or something of value)	○	○	○	○	○	○
18.	Sports betting (e.g., Mise-O-Jeu.)	○	○	○	○	○	○
19.	Sports pools, fantasy leagues or games (e.g., hockey, basketball, etc.)	○	○	○	○	○	○
20.	Horse racing	○	○	○	○	○	○
21.	Table games at casinos (e.g., poker, black jack, roulette, etc.)	○	○	○	○	○	○
22.	Your or someone else's performance in games of skill (e.g., pool, golf)	○	○	○	○	○	○
23.	Bingo (for money or something else of value)	○	○	○	○	○	○
24.	Any other form of gambling/betting Please specify: _____	○	○	○	○	○	○

PLANS

This section of the questionnaire has sentences that deal with plans to gamble in the future. Even if you don't gamble, select the answer that best describes your plans to gamble in the future.

	IN THE <u>NEXT 3 MONTHS,</u> I PLAN TO...	**Strongly disagree**	**Disagree**	**Not sure/ Neither agree nor disagree**	**Agree**	**Strongly agree**
25.	... play electronic gaming machines or slot machines (e.g., video lottery terminal)	○	○	○	○	○
26.	... buy a lottery or an instant scratch ticket	○	○	○	○	○
27.	... bet on sports for money (e.g., sports cards, football pools, fantasy leagues, etc.)	○	○	○	○	○
28.	... play cards for money (poker, black jack)	○	○	○	○	○
29.	... gamble in some way	○	○	○	○	○
30.	... spend at least $5 on gambling	○	○	○	○	○
31.	... spend at least $20 on gambling	○	○	○	○	○

EMOTIONS

This section of the questionnaire has sentences that deal with feelings you might have after gambling. Even if you don't gamble, answer the questions imaging how you would feel after gambling.

		Strongly disagree	**Disagree**	**Not sure/ Neither agree nor disagree**	**Agree**	**Strongly agree**
32.	If I gambled, I would regret it afterwards	○	○	○	○	○
33.	I would be worried if I gambled more money than I planned to	○	○	○	○	○
34.	If I gambled, I would feel upset afterwards	○	○	○	○	○
35.	I would regret it if I gambled more money than I planned to	○	○	○	○	○
36.	If I gambled, I would worry afterwards	○	○	○	○	○
37.	I would feel upset if I gambled more money than I planned to	○	○	○	○	○

CONTROL

This section has sentences that describe how people feel about their ability to "say no" to gambling.

		Strongly disagree	Disagree	Agree	Strongly agree
38.	I would be able to not gamble if I tried hard enough	○	○	○	○
39.	Even if someone would disagree or argue with me, I would be able to find a way to not gamble	○	○	○	○
40.	It would be easy for me to stick to my goal of not gambling	○	○	○	○
41.	I would be able to resist gambling in spite of peer pressure	○	○	○	○
42.	My intelligence would help me resist gambling in spite of peer pressure	○	○	○	○
43.	I would be able to solve problems related to my gambling if I made enough efforts	○	○	○	○
44.	I would be able stay calm when facing difficulties related to my gambling	○	○	○	○
45.	If I had a problem related to my gambling, I would be able to think of several solutions	○	○	○	○
46.	I would be able think of a way out even if I was in a difficult situation where I was trying to not gamble	○	○	○	○
47.	No matter what would happen to me, I would be able to say no to gambling	○	○	○	○

FAMILY AND PEER NORMS

This section of the questionnaire has sentences that describe how some people imagine what their family and friends think about gambling.

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
48.	Most of my friends approve of gambling and believe it is okay	○	○	○	○	○
49.	Most of my friends gamble sometimes	○	○	○	○	○
50.	My friends often get together to gamble (for example, to play cards for money) or go out to places where they can gamble	○	○	○	○	○
51.	Generally, I try to fit in with what my friends want	○	○	○	○	○
52.	My family approves of gambling and believes it is okay	○	○	○	○	○
53.	People in my family gamble sometimes	○	○	○	○	○
54.	People in my family often go to places where they can gamble	○	○	○	○	○
55.	My family members spend $20 or more per week on gambling	○	○	○	○	○
56.	My family members spend $100 or more per week on gambling	○	○	○	○	○
57.	Generally, I try to fit in with what my family wants	○	○	○	○	○
58.	My friends would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○
59.	My family would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○
60.	My friends would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○
61.	My family would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○

ANSWER THESE QUESTIONS ONLY IF YOU HAVE GAMBLED ON ONE OR MORE ACTIVITIES DURING THE LAST THREE MONTHS

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

Never ○ Once or twice ○ Sometimes ○ Often ○

63. 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 ○

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

Never ○ Once or twice ○ Sometimes ○ Often ○

65. 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 ○ Never tried to cut down ○

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

Never ○ Once or twice ○ Sometimes ○ Often ○

67. 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 ○ Often ○

68. In the past year, has your gambling ever led to:

		Never	Once or twice	Sometimes	Often
a.	Lies to your family?	○	○	○	○
b.	Arguments with family/friends or others?	○	○	○	○
c.	Missing school?	○	○	○	○

69. In the past year, have you ever taken money from the following without permission to spend on gambling:

		Never	Once or twice	Sometimes	Often
a.	School dinner money or fare money?	○	○	○	○
b.	Money from your family?	○	○	○	○
c.	Money from outside the family	○	○	○	○

INFORMATION FOR MATCHING QUESTIONNAIRES

NOTE: Please provide us with your birth date, your mother's surname, and the last two digits of your telephone number to help us match up this questionnaire to later questionnaires you will be asked to fill out.

Once questionnaires are matched, you will be given an ID number. This page will then be detached and stored separately from the questionnaires to ensure the anonymity of questionnaire responses.

Date of birth:

☐☐☐☐ - ☐☐ - ☐☐
Year Month Day

Mother's surname:

_____

Last two digits of telephone number:

☐☐

The International Centre for Youth Gambling Problems & High-Risk Behaviors is also interested in contacting students at a later date to have them participate in a follow-up survey. If you are interested in participating in this follow-up survey, please provide your e-mail address below so that we may contact you in the future.

E-mail: _____

Appendix H

Questionnaire Time 2, Study 2

GAMBLING refers to when you bet or risk money or something of value so that you can win or gain money or something else of value.
For each statement, please indicate your response by filling in the circle under the statement that you agree with. All information is confidential and anonymous.

For each question, please fill in the marks like this: ● NOT like this: ⊗ ◪ ⊘

A. Gender:

Male ○ Female ○

B. Grade:

7 (Sec.1) ○ 8 (Sec.2) ○ 9 (Sec.3) ○ 10 (Sec.4) ○ 11 (Sec.5) ○

ATTITUDES

This section of the questionnaire has sentences that describe what some people think about gambling. Even if you don't gamble, select the answer that best describes what you think about gambling.

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
1.	There is too much gambling today	○	○	○	○	○
2.	Most people can control their gambling	○	○	○	○	○
3.	Gambling is just another way to pass the time	○	○	○	○	○
4.	Gambling destroys families	○	○	○	○	○
5.	Gambling is a fun activity	○	○	○	○	○
6.	Gambling is bad for society	○	○	○	○	○
7.	I think some gambling should be legal	○	○	○	○	○
8.	Gambling should be controlled by law so people don't overdo it	○	○	○	○	○
9.	Gambling should be illegal	○	○	○	○	○
10.	Gambling from time to time is harmless	○	○	○	○	○
11.	Gamblers need help from a counsellor or psychologist	○	○	○	○	○
12.	Basically I approve of gambling and believe it is okay	○	○	○	○	○

PLANS

This section of the questionnaire has sentences that deal with plans to gamble in the future. Even if you don't gamble, select the answer that best describes your plans to gamble in the future.

	IN THE NEXT 3 MONTHS, I PLAN TO...	Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
13.	... bet on sports for money (e.g., sports cards, football pools, fantasy leagues, etc.)	○	○	○	○	○
14.	... play cards for money (poker, black jack)	○	○	○	○	○
15.	... play electronic gaming machines or slot machines (e.g., video lottery terminal)	○	○	○	○	○
16.	... buy a lottery or an instant scratch ticket	○	○	○	○	○
17.	... spend at least $5 on gambling	○	○	○	○	○
18.	... spend at least $20 on gambling	○	○	○	○	○
19.	... gamble in some way	○	○	○	○	○

EMOTIONS

This section of the questionnaire has sentences that deal with feelings you might have after gambling. Even if you don't gamble, answer the questions imaging how you would feel after gambling.

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
20.	I would feel upset if I gambled more money than I planned to	○	○	○	○	○
21.	If I gambled, I would worry afterwards	○	○	○	○	○
22.	I would regret it if I gambled more money than I planned to	○	○	○	○	○
23.	If I gambled, I would feel upset afterwards	○	○	○	○	○
24.	I would be worried if I gambled more money than I planned to	○	○	○	○	○
25.	If I gambled, I would regret it afterwards	○	○	○	○	○

CONTROL

This section has sentences that describe how people feel about their ability to "say no" to gambling.

		Strongly disagree	Disagree	Agree	Strongly agree
26.	I would be able to resist gambling in spite of peer pressure	○	○	○	○
27.	No matter what would happen to me, I would be able to say no to gambling	○	○	○	○
28.	If I had a problem related to my gambling, I would be able to think of several solutions	○	○	○	○
29.	I would be able to not gamble if I tried hard enough	○	○	○	○
30.	Even if someone would disagree or argue with me, I would be able to find a way to not gamble	○	○	○	○
31.	I would be able stay calm when facing difficulties related to my gambling	○	○	○	○
32.	I would be able think of a way out even if I was in a difficult situation where I was trying to not gamble	○	○	○	○
33.	My intelligence would help me resist gambling in spite of peer pressure	○	○	○	○
34.	I would be able to solve problems related to my gambling if I made enough efforts	○	○	○	○
35.	It would be easy for me to stick to my goal of not gambling	○	○	○	○

FAMILY AND PEER NORMS

This section of the questionnaire has sentences that describe how some people imagine what their family and friends think about gambling.

		Strongly disagree	Disagree	Not sure/ Neither agree nor disagree	Agree	Strongly agree
36.	People in my family gamble sometimes	○	○	○	○	○
37.	My family approves of gambling and believes it is okay	○	○	○	○	○
38.	Generally, I try to fit in with what my family wants	○	○	○	○	○
39.	People in my family often go to places where they can gamble	○	○	○	○	○
40.	My family members spend $100 or more per week on gambling	○	○	○	○	○
41.	My family members spend $20 or more per week on gambling	○	○	○	○	○
42.	Most of my friends approve of gambling and believe it is okay	○	○	○	○	○
43.	Generally, I try to fit in with what my friends want	○	○	○	○	○
44.	Most of my friends gamble sometimes	○	○	○	○	○
45.	My friends often get together to gamble (for example, to play cards for money) or go out to places where they can gamble	○	○	○	○	○
46.	My friends would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○
47.	My family would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○
48.	My family would disapprove of me buying a lottery or a scratch ticket	○	○	○	○	○
49.	My friends would disapprove of me playing slot machines or video lottery terminals (VLTs)	○	○	○	○	○

INFORMATION FOR MATCHING QUESTIONNAIRES

NOTE: Please provide us with your birth date, your mother's surname, and the last two digits of your telephone number to help us match up this questionnaire to later questionnaires you will be asked to fill out.

Once questionnaires are matched, you will be given an ID number. This page will then be detached and stored separately from the questionnaires to ensure the anonymity of questionnaire responses.

Date of birth:

☐☐☐☐ - ☐☐ - ☐☐
Year Month Day

Mother's surname:

_____

Last two digits of telephone number:

☐☐

The International Centre for Youth Gambling Problems & High-Risk Behaviors is also interested in contacting students at a later date to have them participate in a follow-up survey. If you are interested in participating in this follow-up survey, please provide your e-mail address below so that we may contact you in the future.

E-mail: _____