

Fold, Check, Hit Me! Impact of Lifestyle on the Trajectories of Problem Gamblers

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Abstract

Several studies have demonstrated the intermittent nature of problematic gambling behaviours. Despite the upsurge in research in this area, few studies have examined the dynamics of gambling behaviour or the factors influencing gambling trajectories. Using a retrospective self-report gambler survey inspired by the life history calendar method, the current study sheds light on the intermittency of gambling and the static and dynamic factors that may modulate gambling trajectories. Attention was paid to deviant life circumstances, especially criminal offending, and their effects on gambling parameters. The multilevel analyses results, conducted with data gathered from a sample of one hundred problem gamblers, revealed the impact of life circumstances on these trajectories. On the one hand, sources of social control—hours worked, participation in therapy—create the effect of alleviating gambling problems. On the other hand, deviant life circumstances—commission of lucrative crimes, consumption of psychoactive substances, paying gambling debt—exacerbated gambling. The dynamic factors that predict changes in gambling behaviour and identified in this research support the development of intervention policies based around them.

Keywords: gambling problems, life-course, life circumstances, deviant behaviours, relapse, abstinence, relative losses

Résumé

Plusieurs études ont démontré la nature intermittente des comportements de jeu problématique. Malgré la recrudescence de la recherche dans ce domaine, peu d'études ont examiné la dynamique du comportement de jeu ou les facteurs influençant les trajectoires de jeu. À l'aide d'une enquête rétrospective sur les joueurs compulsifs autodéclarés, inspirée de la méthode du calendrier sur l'historique de vie, cette étude met en lumière l'intermittence du jeu et les facteurs statiques et dynamiques qui peuvent moduler les trajectoires de jeu. L'attention a été portée sur les conditions de vie déviantes, en particulier les infractions criminelles et leurs effets sur les paramètres de jeu. Les résultats des analyses à plusieurs niveaux, réalisés à partir de

données recueillies auprès d'un échantillon de cent joueurs compulsifs, ont révélé l'impact des circonstances de la vie sur ces trajectoires. D'une part, les structures de contrôle social, p. ex., les heures travaillées, la participation à une thérapie, ont pour effet d'atténuer les problèmes de jeu. D'autre part, les circonstances de vie déviantes, comme la perpétration de crimes lucratifs, la consommation de substances psychoactives, le remboursement des dettes de jeu, aggravent le jeu. Les facteurs dynamiques qui prédisent les changements dans le comportement de jeu et qui ont été répertoriés dans cette recherche appuient l'élaboration de politiques d'intervention fondées sur ces facteurs.

Introduction

Over the years, studies have reported variations in the prevalence of problem gambling (Lesieur, 1991; Shaffer, Hall, & Vander Bilt, 1999; Villella et al., 2011; Williams, Volberg, & Stevens, 2012). Despite the upsurge in research concerning this recurring phenomenon, few studies have examined the dynamics of gambling behaviour or the specific factors influencing gambling trajectories. Research on recovery and relapse suggests that the problems problem gamblers face are transient and episodic, rather than chronic and continuous (Hodgins & el-Guebaly, 2004; Ledgerwood & Petry, 2006; Oei & Gordon, 2007; Thygesen & Hodgins, 2003; Viets & Miller, 1997; Walker, 1993), which hints at the impact of factors varying over time. However, no longitudinal studies have been conducted concerning the relationship between life events (e.g., work, intimate relationships, suicide attempts) and gambling, in contrast to the respective parallel situations regarding other deviant behaviours.

On the other hand, many studies executed over the last twenty years have demonstrated that gambling co-occurs and shares aetiological similarities with a variety of deviant behaviours, particularly criminality and substance abuse (Welte, Barnes, Wiczorek, Tidwell, & Parker, 2004). Despite the existence of numerous plausible hypotheses, the nature of the relationship between these behaviours still remains largely unresolved. Given the great instability of problematic gambling behaviours, this study examines changes in the trajectories of problem gamblers through the life-course perspective, an approach which provides a theoretical framework for analyzing the synchronicity of life events and gambling behaviours. Based on interviews conducted with 100 problem gamblers using a retrospective self-report gambler survey inspired by the life-course calendar method, the current study sheds light on the intermittency of gambling, and the static (antecedent and stable) and dynamic (varying over time) factors that may modulate gambling trajectories. Attention was paid to deviant life circumstances, especially criminal offending, and their effects on gambling parameters.

Problematic Gambling Behaviours

Although scarce, certain studies have indeed examined the stability of gambling problems. For instance, LaPlante, Nelson, LaBrie, and Shaffer (2008) found that pathological gambling is not progressive and enduring. Likewise, the few existing longitudinal studies on problem gambling address the fact that, although prevalence at the aggregate level might seem relatively stable, it is nevertheless more episodic and transitory at the individual level (Abbott, Williams, & Volberg, 2004; Slutske, Jackson, & Sher, 2003). Relating to those findings, several studies of recovery, abstinence, and relapse have demonstrated the intermittent nature of problematic gambling behaviours (Hodgins & el-Guebaly, 2004; Ledgerwood & Petry, 2006; Oei & Gordon, 2007; Thygesen & Hodgins, 2003; Viets & Miller, 1997; Walker, 1993). Of particular interest, Walker (1993) reported that a high proportion of gamblers in therapy returned to gambling again after a few years of abstinence (71% after one year and 85% after two years). Similar results were reported by Hodgins and el-Guebaly (2004), who found that 92% of a sample of 100 problem gamblers who had recently stopped gambling relapsed over the 12-month window period. Two-thirds of the relapses lasted more than one day, indicating a high inter-subject variability and the difficulty of precisely determining the duration of problem gamblers' trajectories.

The poor long-term prognosis of recovery from gambling problems has been attributed to both the factors that predict starting to gamble and those that exacerbate gambling. Although many studies have investigated the factors that predict starting to gamble, no consensus has been reached concerning the impact of sociodemographic factors such as age, sex, and socioeconomic status. Indeed, where certain studies attest of a correlation between gambling problems and sociodemographic elements, others do not find any compelling association regarding those factors (Barnes, Welte, Hoffman, & Dintcheff, 2005; Raylu & Oei, 2002; Welte, 2001; Welte et al., 2004; Welte, Barnes, Wieczorek, Tidwell, & Parker, 2001). Regarding personality traits, thrill seeking appears to increase the probability of engaging in high-risk behaviours, such as gambling and criminality (Blaszczynski, Wilson, & McConaghy, 1986; Coventry & Brown, 1993). Leblond, Ladouceur, and Blaszczynski (2003) demonstrated that impulsivity - which can be defined as inadequate self-control over the expression of behaviours - is associated with treatment failure among gamblers. More generally, problem gambling has been repeatedly reported to be strongly associated with impulsivity (Barnes, Welte, Hoffman, & Dintcheff, 1999; Carlton & Manowitz, 1994; Dussault, Brendgen, Vitaro, Wanner, & Tremblay, 2011; Steel & Blaszczynski, 1998; Vitaro, Arseneault, & Tremblay, 1997; 1999). These results are consistent with those of other studies of risk factors, and suggest that a pattern of deviant behaviour underlies a life of criminality or problem gambling (Barnes et al., 2005). Thus, impulsivity and thrill seeking, which are often regarded as dimensions of the larger concept of low self-control (Gottfredson & Hirschi, 1990), are thought to be antecedents of deviant behaviours (Vitaro, Brendgen, Ladouceur, & Tremblay, 2001). It should be noted that poor or low self-control (LSC) is not specific to criminal offending, but is also observed in a variety of self-centred, reckless, "uncontrolled" or "unregulated" behaviours, including problem gambling. Gottfredson and Hirschi

(1990) consider criminal offending to be analogous to many other behaviours, including smoking, drinking, using drugs, gambling, having illegitimate children, and illicit sex. However, while the common-antecedents framework sheds light on problem gamblers' sociodemographic characteristics and personality traits, this knowledge is essentially based on cross-sectional studies which provides a static and therefore truncated model of problem gambling, one that fails to take into account all of the phenomenon's complexity.

Few studies have been published concerning the dynamic factors that modulate gambling behaviours, and no longitudinal studies of how gambling behaviour is affected by life events or other circumstances. However, certain studies have noted the importance of gambling behaviours in the appearance and persistence of problem gambling. Thus, Goudriaan, Slutske, Krull, & Sher (2009) have reported that the risk and severity of gambling problems is partially determined by the number and types of games that gamblers indulge in. On the other hand, a prominent school of thought, possibly reflecting the psychological foundation of the diagnosis of gambling problems, considers pathological gambling to be an addiction comparable to substance abuse. It may be noted that changes in the DSM-V follow this perspective by classifying problematic gambling under *Addiction* and *Related Disorders*. Furthermore, many studies of co-dependence have established a strong association between substance abuse and pathological gambling (Barnes et al., 1999, 2005; French, Maclean, & Ettner, 2008). Certain authors have gone as far as to consider alcohol abuse and pathological gambling to be complementary phenomena (Elia & Jacobs, 1993; French et al., 2008). In this view, the two behaviours are reciprocal risk factors (Grant, Kushner, & Kim, 2002; Maccallum & Blaszczyński, 2002; Welte et al., 2004), presumably because the disinhibition caused by substance abuse is partially responsible for the intensification of gambling behaviours or reduced income and other financial problems because of the possibility that gambling might increase drinking habits.

Another relationship is observed, albeit much less extensively studied, between pathological gambling and criminality (Lesieur, 1977; Lesieur & Rosenthal, 1991; Livingston, 1974). Barnes et al. (1999) reported that certain crimes were strongly associated with the frequency of gambling. Studies of members of Gamblers Anonymous have reported that 20–85% of these individuals had committed crimes, and that 23% had an actual criminal record (Blaszczyński & McConaghy, 1994; Meyer & Fabian, 1992; Templer, Kaiser, & Siscoe, 1993). The nature of the association between pathological gambling and criminality remains largely obscure, but the most widespread hypothesis is that gambling problems predict acting out. In this view, pathological gamblers first finance their gambling from legal sources, but when these are exhausted, certain gamblers—depending on opportunity, perceived risk, and their value systems—turn to crime (Lesieur, 1977; Meyer & Fabian, 1992; Rozon, 1987). When legal sources of income become inadequate, gamblers become despondent; many authors have suggested that is the tipping point at which certain gamblers are driven to their final resort—illegal income (American Psychiatric Association, 1994; Blaszczyński, 1994; Doley, 2000; Fulcher, 1979; Lesieur & Blume, 1991; Taber, McCormick, Russo, Adkins, & Ramirez, 1987; Wellford, 2001).

Although this explanation is plausible and certainly describes many cases, no longitudinal study has clearly established gambling as a universal aetiological factor for criminality (Barnes et al., 2005). However, in a study by Wanner, Vitaro, Carbonneau, & Tremblay (2009) examining cross-lagged links among various deviant behaviours, the authors note that gambling problems at age 16 were linked to later theft, but only for adolescents with deviant peers, a finding which suggests a prior delinquent context.

To further our understanding of the factors that determine gambling trajectories, it is necessary to analyze these trajectories from a dynamic perspective, and adopt a paradigm which emphasizes the importance of temporality.

Theoretical Framework of Criminal Career

In general, studies of criminal careers have focused on the development and evolution of criminal and antisocial behaviours, and on risk factors and lifestyles that influence these trajectories (Farrington, 2003). Blumstein et al. (1986) define an individual's "criminal career" as the longitudinal sequence of crimes they commit. A criminal or deviant career is thus temporally bounded: it includes both a beginning and an end. The trajectory from the beginning to the end of the career can be described in terms of variables related to acts of interest (e.g., frequency of offending). Blumstein, Cohen, and Farrington (1988) point out that the criminal career paradigm is not strictly speaking a theory of crime but rather a way of structuring and organizing knowledge about key determinants of acting out. In this paradigm, individuals begin offending at a specific age, commit a variety of crimes at a rate that is specific to them, and stop offending at some point (Piquero, Farrington, & Blumstein 2003, 2007). Studies of criminal careers have clearly demonstrated the dynamic nature of offending, over both the short and the long terms (Griffin & Armstrong, 2003; Horney, Osgood, & Marshall, 1995; Laub & Sampson, 1993, 2003; Ouellet & Tremblay, 2014; Sampson & Laub, 1990, 1993).

Life Course Perspective

The life course perspective is based on two central concepts: trajectories and transitions. The concept of trajectory, as defined by Elder (1985), offers a long-term view of the life course, a perspective, for example, from which to examine careers. Each life course has many interlocking trajectories (e.g., employment, criminal career, etc.). Transitions, on the other hand, are specific, relatively short-term, life events (first marriage, first job, etc.) that modulate trajectories and are to be viewed in respect to their temporal context "and the resources people bring to it" (a divorce experienced by a person in his or her 20s versus in that person's 50s, as for the example Elder provides). Finally, incongruences between trajectories and transitions generate turning points or changes in an individual's life course (Farrington, 2005; Griffin & Armstrong, 2003; Horney et al., 1995; Laub & Sampson, 2003; Sampson & Laub, 1993). In Sampson & Laub's (1990, 1993; Laub & Sampson, 2003) view, criminal career is modulated by informal forms of social control, that is, significant

events in offenders' social lives. Adopting the life course perspective and relying on individual trajectories from childhood to late adulthood (participants were last met when they were 70), Laub and Sampson (2003) conclude that desistance from crime is especially influenced by work and marriage.

Application of this paradigm has not been limited to classic forms of social control, but has also extended to circumstances more closely related to offenders' deviant lifestyles. For example, Horney et al. (1995) reported offenders were more likely to offend in the months in which they increased their consumption of alcohol and drugs. Uggen and Thompson (2003) and McGloin, Sullivan, Piquero, and Pratt (2007) have reported that increased drug consumption is associated with increased illegal income and diversity of criminal activities. In addition, the risks of arrest and incarceration are known to be higher during periods of penal surveillance. Probation has been variously reported to have no effect on criminal activities (Horney et al., 1995) and to reduce, but not eliminate such activities (McGloin et al., 2007; Ouellet & Tremblay, 2014). In summary, circumstances related to deviant lifestyles have been shown to influence the dynamics of criminal trajectories over both the short and long terms.

The features of the criminal-career paradigm suggest that it may be reasonably applied in research on deviant careers, such as those of problem gamblers. Concretely, the life-course perspective provides a theoretical framework for analyzing the synchronicity of life events and gambling behaviours in studies of problem gamblers' trajectories. It thus helps fill a fundamental knowledge gap on gambling problems and sheds light on the dynamic factors linked to gambling trajectories.

Current Study

Recent studies have suggested the career of gamblers resembles that of hardened criminals, is punctuated by dramatic turns of events, and alternates between relatively intense periods of activities and periods of calm. The possibility that life events influence gambling trajectories, just as they do criminal careers, cannot therefore be excluded from a dynamic point of view. The objective of this study was to shed light on the interaction between conventional (employment, intimate relationships, therapy) and deviant (lucrative criminality, alcohol and drug expenditures, loan shark loans) life circumstances and three indicators of gambling: amounts spent on gambling, interruptions in gambling, and relapse. The theoretical framework for the study was inspired by the concept of criminal career generally, and the life course perspective. To ensure optimal analysis of our diversified sample of gamblers, linear hierarchical models were used.

Method

Participants

The data were obtained through interviews of 100 problem gamblers recruited from several therapeutic resources in the Montreal region over a three-year period (2006–2008).

Participants were recruited essentially on the basis of their score on the Canadian Problem Gambling Index (CPGI), developed by Ferris and Wynne (2001). In the present study, the mean score of the gamblers to the CPGI was 17.6 ($SD = 4.9$). The gamblers interviewed for this study scored between 8 and 27, indicating that they were problem gamblers. The majority of the participants were male (64.0%) and relatively uneducated (51.0% had no more than a high school diploma), and the mean age was 46 years. All the participants were in therapy for their gambling problem, which had started, on average, 10.5 years prior to their entry into therapy.

Most of the participants (53.0%) had only pursued one form of gambling during the window period, and 92.0% had concentrated on video poker (deduced from the amounts gambled). Although many of these characteristics are similar to those reported in the literature (Chevalier & Allard, 2001; Custer, 1982; Wellford, 2001), this sample was not representative of problem gamblers.

The interviews covered the 36 months preceding the participant's entry into therapy, and there were thus 3,600 distinct months of observations (100 participants x 36 months). The interviews lasted approximately two hours and were conducted face-to-face. The questionnaire was inspired by the one administered to federal inmates to characterize their financial situation in the three years preceding their incarceration (Morselli & Tremblay, 2010). It comprises a large section devoted to the chronological collection of information on a variety of subjects, including life events, legal income, gambling, borrowing strategies, and criminal offending. Life history calendar method was developed by Freedman, Thornton, Camburn, Alwin, and Young-DeMarco (1988) for use in the study of criminal careers, and has proven to be reliable (Ahn, Blumstein, & Schervish, 1990; Bradburn, Rips, & Shevell, 1987; Caspi et al., 1996; Griffin & Armstrong, 2003; Horney et al., 1995; Horney & Marshall, 1991; MacKenzie & Li, 2002; McGloin et al., 2007; Ouellet, 2018; Ouellet & Bouchard, 2017; Ouellet & Tremblay, 2014; Sutton et al., 2011; Sutton, Bellair, Kowalski, Light, & Hutcherson, 2011; Uggen & Thompson, 2003). The method not only improves the quality of retrospective data, especially by allowing synchronization of events, but also facilitates the identification of likely sequences of events and changes (for more details on life history calendars, see Freedman et al., 1988).

Money issues are a constant preoccupation of gamblers, and the amounts bet are a function of winnings and losses. This “money management” holds multiple consequences, and is associated with life events that tend to reinforce the credibility of the self-reports.

Measures

Relative losses, periods of abstinence, and relapses. The behavioural dynamics of the participants' gambling—more specifically, changes in actual gambling—were evaluated in terms of three measures: relative losses, periods of abstinence, and relapses.

Relative loss. Relative loss is the ratio of gambling losses to legal income in each month. This ratio is a measure of the extent to which life circumstances increase or decrease monthly gambling activities. Moreover, it to some extent contextualizes the losses, because while losing \$10,000 is a hardship in absolute terms, it is even more problematic if one's income is \$20,000 rather than \$200,000. Relative losses were calculated only for the months in which participants actually gambled—that is, months in which the participants abstained were excluded. As only the months in which gambling occurred were analyzed, the number of months of observation varied from individual to individual. This is not problematic, given the flexibility of linear hierarchical models (Willett, Singer, & Martin, 1998). Dupéré, Lacourse, Vitaro, and Tremblay (2007) noted that these types of measures do not require that participants be measured simultaneously, at a fixed rate, or the same number of times. The results thus reflect changes in gambling behaviour in the months the participants gambled. A strong majority of the participants were considerably in debt during the window period: the median relative loss was 53.1%, and the mean relative loss was 124.3%. The significant discrepancy gap between the mean and the median relative loss is, to some extent, a reflection of the volatility of gambling behaviour.

Periods of abstinence. Given this variability, it was thought useful to specifically investigate periods of abstinence and identify predictors of abstinence of at least one month. Half of the participants (50%) abstained for at least one month during the window period, and the mean duration of their abstinence was 8.5 months. The data set used to examine the dynamics of abstinence consisted of 3,600 observations (100 participants x 36 months).

Relapse. Relapse was considered to occur in the first month of gambling following abstinence for at least one month. The analysis of relapses thus examined the experience of individuals who had undergone one period of abstinence during the window period (because the analysis of changes in developmental trajectories require an observation period of at least 3 months (Dupéré et al., 2007), this was the minimal observation period for each participant in this study) since to relapse one must have previously abstained. In fact, half of the participants had not abstained during the window period. The data set for the analysis of relapse consisted of the observations for the months of abstinence, and where applicable, the months in which relapse occurred (50 participants x 9.88 months).

Life Circumstances – Dynamic Factors. Life circumstances were divided into groups: conventional and deviant (see Table 1 for descriptive statistics). Conventional life circumstances included living with an intimate partner and the number of hours worked. A significant proportion (46%) of participants remained single throughout the window period. Among participants who maintained an intimate relationship for at least one month, the mean duration of the relationship was 27.1 months. Most (86.7%) of the participants were employed during the window period, and the mean duration of employment 29.8 months. As relative loss is based on legal income, it also appeared useful to compare the number of hours each

Table 1
Descriptive Statistics

Predictor	Mean (<i>SD</i>)
Level 1 - Dynamic Predictors (<i>n</i> = 3600)	
Living with an intimate partner (1=yes; 0=no)	41.1%
Hours spent at work	1.67 (1.21)
Does not work	29.2%
Less than the window period (WP) average	7.3%
Equal to the WP average	31.0%
Greater than the WP average	32.5%
Therapy (1=yes; 0=no)	12%
Alcohol and drug consumption (\$)	1.40 (1.12)
Paying off a loan shark (1=yes; 0=no)	18.3%
Lucrative crimes (1=yes; 0=no)	12.5%
Level 2 – Static Predictors (<i>n</i> = 100)	
Sex (0=female; 1=male)	64.0%
Age (years)	46.38 (10.53)
Level of education	2.71 (1.39)
Without high school diploma	25%
High school diploma	26%
Vocational studies diploma	15%
College	21%
University	13%
ICJE (9-item scale)	17.41 (4.88)
LSC (24-item scale)	81.62 (17.14)

participant worked in each month to their mean monthly hours over the entire window period. In addition, the effect of being in or out of therapy during the window period was analyzed. Most (67.3%) of the participants had been in therapy, and the mean duration of therapy was 4.5 months.

To evaluate the intensity of participants' deviant lifestyles, we used three measures: (1) total monthly expenditures on alcohol and drugs¹ (2) loan shark loans, and (3) involvement in lucrative crime. The mean monthly expenditure on psychoactive substances was CAN \$244. Loan shark loans—more specifically, the months a participant was indebted to a loan shark—were also analyzed. Almost 38% of participants had borrowed money from a loan shark during the window period, and the mean duration of indebtedness was 16.8 months. Crimes directly related to gambling—e.g., to finance gambling, defray daily expenses, or pay off gambling debts—were committed by 35% of participants. This result is consistent with literature reports (Doley, 2000). The monthly illegal income (for the months in which crimes were committed) was considerable: geometric mean = \$5,197, *Mdn* = \$2,500.

¹Specifically, alcohol, marijuana/hashish, cocaine, crack/freebase, heroin/methadone, barbiturates/depressants, hallucinogens, amphetamines, and Valium™/tranquilizers/morphine. It should be noted that the actual variable analyzed was the logarithm of the monthly expenditures.

The mean duration of offending among participants who had committed lucrative crimes was 12.6 months. These data were used to analyze the effect of the commission of lucrative crimes (yes/no) on the participants' monthly gambling habits.

Personal characteristics of participants – static factors. Evidence on the impact of sex, age and education on the prevalence of pathological gambling has been demonstrated in several studies. It indicates that, more often than not, the most severely pathological gamblers tend to be male (the reported proportion of men varies from 60% to 80%) (Chevalier & Allard, 2001; Custer, 1982; Wellford, 2001), older (tending to be overrepresented in age groups older than 30 years) (Chevalier & Allard, 2001), and less educated (Chevalier & Allard, 2001). Accordingly, the effect of sex, age, and education was controlled for, to understand better the effect of life circumstances on relative losses, periods of abstinence, and relapses. To measure propensity to gamble, both the CPGI and the self-control scale developed by Grasmick, Tittle, Bursik Jr., and Arneklev (1993) based on Gottfredson and Hirschi's (1990) model were used.

Analytical Strategy

It was considered useful to distinguish between the effects of the participants' dynamic and static characteristics. The first level (Level 1) comprises dynamic characteristics, i.e., conventional or deviant life events, which may vary from month to month for each participant; data on these characteristics were collected from the participants' calendars. The second level (Level 2) comprises static characteristics, i.e., characteristics that did not change during the window period. The association between monthly participant characteristics (Level 2) and life events (Level 1) on variations in gambling behaviour was analyzed using linear hierarchical models. Van Der Leeden (1998) notes that one of the most interesting uses of multi-level models is their application to repeated-measure data. Multi-level models allow flexible manipulation of hierarchical data while preserving the independence of the error terms, and have been demonstrated to be better suited to the analysis of this type data than are traditional single-level models (Raudenbush, & Byrk, 2002; Goldstein, 1987; Van Der Leeden, 1998; Wooldredge, Griffin, & Pratt, 2001).

To measure the intensity of gambling activity, two models were used, depending on the dependent variables in question. A linear hierarchical model (LHM) was used to analyze relative losses (ratio of gambling losses to income). LHMs are a variant of multiple regression models for nested or hierarchical data (Horney et al., 1995), and measure the variance explained by each level of analysis. A second type of model was used for the analysis of periods of abstinence, and relapses. As abstinence and relapse are binary variables (no = 0, yes = 1), and the error terms of a binary variable are not normally distributed, a generalized linear hierarchical model (GLHM) was used. GLHMs are variations of logistic regression models for nested data, and predict the likelihood that an event occurs or does not occur given the presence of selected independent variables. Raudenbush and Byrk (2002) note that GLHMs provide an integrated framework for the analysis of the structure and predictors of life events.

Table 2

Linear Hierarchical Model (LHM) of Relative Losses (monthly gambling losses: income)

Relative Losses	MODEL 1 γ	MODEL 2 γ
Level 1 ($n = 3180$)		
Living with an intimate partner	- 0.04 (0.13)	- 0.02 (0.13)
Hours spent at work	- 0.20 (0.03)**	- 0.21 (0.03)**
Therapy	- 0.29 (0.12)*	- 0.29 (0.13)*
Alcohol & drug consumption (\$)		- 0.13 (0.11)
Paying off a loan shark		0.15 (0.14)
Lucrative crimes		0.73 (0.18)**
Level 2 ($n = 100$)		
Sex	1.25 (0.54)*	1.16 (0.52)*
Age	- 0.02 (0.03)	- 0.03 (0.03)
Level of education	0.05 (0.20)	0.04 (0.19)
CPGI	0.01 (0.05)	0.01 (0.05)
LCS	0.01 (0.02)	0.01 (0.02)
Abstinence during WP (months)	0.16 (0.51)	0.16 (0.49)

Note: Non-standardized regression coefficients presented, standard errors in parentheses. * $p < .05$. ** $p < .001$.

However, unlike LHMs, GLHMs provide no information on the variance explained by each of the levels, because of the heteroscedasticity of the first-degree error terms.

The structure of the two models used, and the explanatory variables analyzed in each model, were the same. In light of the research questions, and to facilitate interpretation of the constant, grand mean centering was used with variables that could not have a value of 0 (age, level of education, scores on the two scales). Because of the possible interaction between participant characteristics and life circumstances, it was assumed that the constant and the slope varied from individual to individual (Hox, 2002; Luke, 2004). The restricted maximum likelihood method was used for estimation, as this method is better suited to the simpler model (Gelman & Hill, 2007; Hox, 2002; Luke, 2004; Raudenbush & Bryk, 2002). The statistical analyses were performed using the HLM software package, version 6.06.

Results

The “unconditional” model presented in Table 2 provides information on the distribution of the variance at two levels of analysis: variance because of life events (Level 1) and variance because of participant characteristics (Level 2). The interclass correlation coefficient (for more details, see Luke, 2004) indicates that 38% of the explained variation in relative losses is because of participant characteristics and 62% by life circumstances.

Model 1 (Table 2) examined the effect of participants’ demographic characteristics and conventional life circumstances on monthly gambling losses over a 36-month

period. Once accounting for deviant life events (Model 2), only the sex of the participants discriminates between the size of their relative losses, with men exhibiting greater relative losses ($B = 1.16, p \leq .05$). Addition of conventional life circumstances revealed that participants better controlled their gambling in months in which they worked a greater number of hours. In other words, relative losses decreased as the number of hours worked increased, and vice versa ($B = -0.21, p \leq .001$). For example, relative losses were almost 21% lower among participants whose monthly hours worked exceeded their average over the window period. Be aware that we could not completely set the tautological aspect of this relationship aside (aspect that had already driven us to use the hours worked per month instead of the monthly incomes to represent the employment concept). A higher number of hours worked raises legal income and therefore reduces the ratio and the measure of relative losses. However, research has shown that more income generally means more gambling among pathological gamblers, which tends to balance this bias in part.

Given the conventional and deviant events in participants' lives, it is interesting to note the effect of voluntary therapy, and Model 1 incorporates the number of months participants were in therapy. Once accounting for deviant life events, being in therapy was associated with a significant reduction in the relative losses of gambling ($B = -0.29; p \leq .05$). Enrolment in therapy was associated with a monthly reduction of relative losses of more than 29%, regardless of the details of the therapy (frequency, approach).

Model 2 of analyzes the impact of participants' deviant behaviours (monthly expenditures on alcohol or drugs, number of months in which loan shark loans were resorted to, number of months in which participants committed lucrative crimes). The first finding was the absence of an effect for loan shark loans and alcohol and drug expenditures on indebtedness. Second result observed in Model 2, the commission of lucrative crimes was strongly associated with relative losses ($B = .73, p \leq .001$). The illegal income earned through lucrative crimes ($M = \$5,197$ in months in which participants offended) not only allows gamblers to continue gambling unabated but also incites them to overinvest. In months in which participants committed at least one lucrative crime, the ratio of their relative losses increased by 73%.

Periods of Abstinence

It is known that the intensity of problem gambling varies over time and that certain events may disrupt gambling behaviour. The analyses described above not only convincingly confirmed this, but also stimulated reflection on certain aspects of the participants' trajectories, including the factors that favour abstinence and relapse.

An overview of the impact of the factors that are linked with abstinence is presented in Table 3. Controlling for individual characteristics, conventional and deviant life circumstances, there was a significant effect for education ($OR = 1.65, p \leq .05$). Thus, the more educated the participant, the more likely he or she was to abstain over the 36-month window period. With each increment in educational level, the

Table 3

*General Linear Hierarchical Model (GLHM) of Periods of Abstinence:
Logistic Coefficients (γ) and Odds Ratios*

Abstinence	MODEL 3		MODEL 4	
	γ	Odds Ratio [95% CI]	γ	Odds Ratio [95% CI]
Level 1 ($n = 3600$)				
Living with an intimate partner	- 0.26	0.771 [0.346-1.720]	- 0.23	0.791 [0.526-1.191]
Hours spent at work	- 0.22**	0.805 [0.661-0.982]	- 0.24*	0.886 [0.800-1.003]
Therapy	1.62**	5.081 [2.735-9.440]	1.53**	4.639 [3.378-6.371]
Alcohol & drug consumption (\$)			- 0.84**	0.432 [0.233-0.574]
Paying off a loan shark			- 0.73*	0.481 [0.271-0.855]
Lucrative crimes			- 2.45**	0.086 [0.036-0.205]
Level 2 ($n = 100$)				
Sex	- 0.71	0.489 [0.156-1.531]	- 0.16	0.856 [0.228-3.211]
Age	- 0.01	0.992 [0.940-1.047]	- 0.05	0.954 [0.895-1.018]
Level of education	0.30*	1.350 [1.015-1.794]	0.50*	1.648 [1.036-2.626]
CPGI	0.00	1.000 [0.896-1.117]	0.02	1.017 [0.896-1.117]
LCS	- 0.01	0.988 [0.954-1.022]	0.02	1.015 [0.975-1.058]
Average relative loss	0.05	1.050 [0.864-1.276]	0.25	1.180 [1.001-1.421]

Note: Standard errors in parentheses. * $p < .05$. ** $p < .001$.

chances of abstaining increased by a factor 1.65: thus, a participant who had attended university was 6.5 times more likely to interrupt his or her gambling than was a participant who had not completed high school.

The time devoted to work each month was also associated with abstinence from gambling (Model 2 - $OR = 0.886$, $p \leq .01$). The greater the number of hours participants worked, the less likely they were to abstain (by a factor of 1.13 for each increment of time devoted to work).

The analysis of gambling losses reveals the role of therapeutic intervention: being in therapy was associated with a substantial reduction in gambling. A reasonable question is therefore whether therapy can influence total abstinence. As Model 4 (Table 3) indicates, there was a significant association between months in therapy and periods of abstinence ($p \leq .01$), with participants in therapy being 4.64 times more likely to stop gambling.

Model 4 incorporates deviant life events. There was a clear negative association between a deviant lifestyle and the probability of abstaining during the window period. Thus, abstinence was negatively associated with monthly alcohol and drug expenditures ($OR = 0.432$, $p \leq .01$). Loan shark loans exhibited a similar effect: participants who paid off a loan shark loan were less likely to interrupt their gambling ($OR = 0.481$, $p \leq .01$). Loan shark loans allow gamblers to continue gambling once legitimate sources of income become inadequate, and, in this study, participants who paid off a loan shark loan were 2.08 times less likely to abstain from

gambling in the month in question. Finally, and not surprisingly, an association was found between lucrative crime and abstinence: participants who committed lucrative crimes were 11.63 less likely to abstain in the month in which they offended ($OR = 0.086$, $p \leq .01$). All these results suggest a strong link between deviant behaviours and the probability of abstinence.

Relapses

For relapse, analysis was limited to participants who had abstained during the window period (regardless of whether they had relapsed or not) ($N = 50$), and the months of abstinence and relapse. For example, if a participant had two four-month periods of abstinence, the total number of months analyzed was 10. For this analysis, the mean observation period was 9.88 months ($SD = 7.61$). Participants who relapsed following abstinence differed from participants who did not abstain in only one way: they were more likely to have enrolled in therapy (78% vs. 56%, $p \leq .05$).

Controlling for individual characteristics, and conventional and deviant life circumstances (Model 6), relapse was more common among men ($OR = 1.781$, $p \leq .05$) and less-educated participants ($OR = 0.802$, $p \leq 0.05$). Men were 1.8 more likely to relapse than were women. The level of education predicted the occurrence and maintenance of abstinence (absence of relapse). Concretely, education exerted a significant effect, with participants with a university education being 5 times less likely to relapse than were participants who had not completed high school.

There was no association between any of conventional life circumstances, hours worked, and months in an intimate relationship, on the one hand, and the probability of relapse, on the other. This result may be related to the effect of therapy, as the risk of relapse was lower in the months in which a participant was in therapy (Model 6 - $OR = 0.364$, $p \leq .05$). In other words, participants who were not in therapy were 2.7 times as likely to relapse as those participants who were.

The analysis of deviant life circumstances (Model 6), like that of other factors related to the dynamics of gambling, sheds light on the context of relapses. Expenditure of alcohol and drug was associated with a greater likelihood of relapse in the month in question ($OR = 1.717$, $p \leq .01$). A similar relationship was observed for paying off a loan shark loan: paying off a loan shark loan was associated with a 2.2-fold increase of the likelihood of relapse ($OR = 2.252$, $p \leq .05$). In addition, participants were 11.1 more likely to relapse in months in which they committed lucrative crimes ($OR = 11.068$, $p \leq 0.01$).

Discussion

This research looked at the short-term dynamics of gambling behaviour. The demonstration highlights the contribution of the criminal career paradigm in understanding other types of deviant trajectories. Moreover, results show that the life course perspective gives access to a better understanding of the changes that may occur in gambling trajectory. This theoretical perspective allows us to make the link

Table 4

General Linear Hierarchical Model (GLHM) of Relapses: Logistic Coefficients (γ) and Odds Ratios

Relapse	MODEL 5		MODEL 6	
	γ	Odds Ratio [95% CI]	γ	Odds Ratio [95% CI]
Level 1 ($n = 494$)				
Living with an intimate partner	0.02	1.023 [0.598-1.751]	- 0.05	0.922 [0.576-1.476]
Hours spent at work	0.07	1.072 [0.814-1.411]	- 0.02	0.982 [0.788-1.225]
Therapy	- 1.04*	.353 [0.130-0.922]	- 1.01*	0.364 [0.129-1.029]
Alcohol and drug consumption (\$)			0.54**	1.717 [1.236-2.387]
Paying off a loan shark			0.81*	2.252 [1.062-4.774]
Lucrative crimes			2.40**	11.068 [3.854-17.789]
Level 2 ($n = 50$)				
Sex	0.70*	2.006 [1.094-3.681]	0.57*	1.781 [0.949-3.341]
Age	0.01	0.990 [0.957-1.024]	0.02	1.019 [0.982-1.057]
Level of education	- 0.17	0.847 [0.692-1.037]	- 0.22*	0.802 [0.660-0.974]
CPGI	0.02	1.023 [0.977-1.072]	0.01	1.001 [0.956-1.049]
LCS	- 0.01	0.982 [0.967-1.139]	- 0.02	0.965 [0.947-1.136]
Average relative loss	0.05	1.056 [0.952-1.172]	- 0.02	0.978 [0.843-1.133]

Note: Standard errors in parentheses. * $p < .05$. ** $p < .001$.

between the individual and his or her environment. The life course perspective places more emphasis on the decision-making process and the events that occur in life to identify changes in individual paths. Studies on life trajectories and transitions are directly inspired by the sociology of change, a concept which has shown that individuals experience several transitions in their lives, moving from one state to another on several occasions. The adoption of this framework (conceptual, theoretical and analytical) has proved fruitful in understanding changes in the trajectories of excessive gamblers.

The exploratory nature and short observation period of this retrospective study notwithstanding, the portrait of problem gamblers observed is quite different from that reported in conventional cross-sectional studies. Uggen and Thompson (2007) explain this difference in terms of the relative strengths of the two types of design: cross-sectional (or inter-individual) studies identify correlates and produce a static portrait, while longitudinal or retrospective (intra-individual) studies identify synchronicities of life circumstances and behaviours, and produce a dynamic portrait. Analyses performed in this study combine the strengths of these two research designs. It justifies the use of multi-level analysis: on the one hand, it is important to control for participants' static characteristics (attributes) in order to identify the effect of life circumstances; on the other hand, it is important to demonstrate that static characteristics may modify the effect of life circumstances.

This study examined the relationship between life circumstances (both conventional and deviant) and gambling behaviour in a sample of problem gamblers. Conventional

life circumstances have been reported to exert a marked effect on criminal trajectories (Griffin & Armstrong, 2003; Horney et al., 1995; Laub & Sampson, 2003; Ouellet, 2018; Ouellet & Bouchard, 2017; Ouellet & Tremblay, 2014), and in this study were found to exert a marked effect on indebtedness, abstinence, and relapses. As problem gambling is the net result of natural inclination, facilitating factors, and inhibitory factors, it is hardly surprising that the participation in, and intensity of, gambling is influenced by a variety of factors and situations.

One of the contributions of this research was to demonstrate the importance of considering the dynamics of deviant circumstances in the understanding of gamblers' paths. However, based on the literature consulted the prediction of the effects of deviant life events could be ambiguous, as both positive and negative effects are conceivable. For example, do gamblers use illegal income to intensify their gambling, pay off gambling debts, or simply continue in their ways? Most authors agree it is despair that generally drives gamblers to crime (Blaszczynski, 1994; Fulcher, 1979; Taber et al., 1987; Wellford, 2001). But this form of essentially expressive crime can only be expected to earn trivial rewards, as the perpetrators act impulsively rather than out of rational consideration of the available opportunities. For this reason, criminal offending is not thought to enjoy any effect on gambling behaviour. This observation is also relevant to alcohol and drug expenditures. Consumption of these products may, to some extent, exacerbate problem gambling—by lowering inhibitions, for example: the more a gambler is intoxicated the easier it is for him or her to spend the money set aside for that person's rent or child's tuition. On the other hand, it is also necessary to consider the hypothesis that two vices or two passions cannot be maintained simultaneously. In fact, addiction transference is a well-known therapeutic concept. Finally, loans from loan sharks may also have positive or negative effects. Are these loans used to pay off creditors, or to continue gambling once other types of loans are unavailable? The first scenario would lead to a decrease in relative losses while the second would lead to either a stabilization or an increase.

Findings show a strong association between the deviant circumstances and monthly variations in gambling activities. The circumstances exacerbate the intensity of gambling activities, encourage continuity and precipitate relapse. The illegal income earned through lucrative crimes ($M = \$5,197$ in months in which participants offended) incites gamblers to overinvest. In months in which participants committed at least one lucrative crime, the ratio of their relative losses increased by 73%. Temporary abstinence is less likely during months when participants are active in crime, when their alcohol and drug expenditures increases and they are also less likely to abstain during months of repayment of a loan shark loan. Finally, committing lucrative crimes, paying off a loan shark loan and increasing expenditure of alcohol and drug were all associated with a greater likelihood of relapse during these months. Our results thus show the close relationship between these deviant circumstances and the gaming habits. Although we cannot establish the causal order of the apparition of these behaviours, we observe these factors are closely associated with gambling activities.

Our results also highlight the impact of hours worked and being in therapy on gambling parameters examined. It has been shown that indebtedness decreased as the number of hours worked increased, but that the greater the number of hours worked also decreases the likelihood that participants will abstain. Regarding the intensity of gambling, our results may reflect the fact that when participants worked an above-average number of hours they spent more time at work and thus had less time to gamble. Conversely, when they worked a below-average number of hours, they may have worked less or lost their job, and thus had more time to gamble. This result supports the idea that participants better controlled their relative losses in months in which they worked more. To interpret the effect on abstinence we presume that more hours spent at work leads to higher income and thus gives the participants a financial cushion granting a false sense of security, which may lessen the pressure to abstain. To summarize, the amount of time spent at work establishes a distinction between gambling and abstinence. However, it also determines the intensity of the gambling habit for those gamblers who do not abstain during a given month. There was a strong association between months in therapy, on the one hand, and the intensity of gambling (relative losses), the probability of abstinence and the probability of relapse, on the other. This result is consistent with those findings reported elsewhere of the effectiveness of therapy among gamblers, specifically, a reduction in gambling following treatment (Lesieur & Blume, 1991; Russo, McCormick, Ramirez, & Taber, 1984; Taber et al., 1987). Considering the results, it is possible to revisit certain assumptions surrounding problem gambling. Certain authors have developed clinically-inspired theoretical models that posit an invariable sequence of phases through which pathological gamblers must progress (Doley, 2000; Lesieur & Blume, 1991). Typically, the sequence begins with a period of winnings, and continues with a progressive intensification (in terms of both frequency and amounts bet) of gambling. The progression is thought to be accelerated by gamblers' impulsivity and the consumption of alcohol and drugs (Browne, 1989). Ultimately, as a result of crushing indebtedness and the inadequacy of legal income, the gambler becomes despondent. It is at this point that the most serious consequences appear: job loss, loan shark loans, criminality, attempted suicide, etc. In the final stage, the gambler recognizes the irrational nature of his or her passion and takes steps to free himself or herself from it.

Although logical and plausible, this vision of problem gambling is not a good fit to our results. It is true that our window period cannot be considered to be representative of the participants' entire gambling career, as the mean duration of gambling career was 10.5 years, and the window period was limited to the 36 months preceding therapy—a period the classic model suggests may be the most intense and tragic stages. Nevertheless, while our results are preliminary and subject to the usual caveats, based on the qualitative observation of the individual trajectories of sample participants (these graphics are not shown), nothing indicates that the participants' gambling behaviour steadily progressed. Our analyses in fact suggest that the amounts bet every month were influenced by a variety of factors. It should also be added that occurrence of numerous periods of abstinence and relapse, observed both in this study and many others (Ledgerwood & Petry, 2006; Oei & Gordon, 2008), argues

against continuous progression. Instead, gambling behaviour appears to be volatile, and this volatility appears to be analogous to that repeatedly reported for criminal offending (Glaser, 1969; Horney et al., 1995; Laub & Sampson, 2003; Matza, 1964; Ouellet, 2018; Ouellet & Tremblay, 2014).

Although the details of this relationship remain unclear, and it is difficult to establish causal relationships (which, in any event, was not the objective of this study), it must be borne in mind many participants did not commit crimes: slightly more than one third (35%) committed crimes during the window period, with this proportion rising to 43% over entire gambling careers. Therefore, certain participants, even when heavily in debt, refrained from offending. Our participants did not therefore behave as would be expected if offending is indeed gamblers' last, despairing attempt to compensate for the inadequacy of legal income (American Psychiatric Association, 1994; Blaszczyński, 1994; Doley, 2000; Fulcher, 1979; Lesieur & Blume, 1991; Taber et al., 1987; Wellford, 2001). In fact, criminal offending appears to have been more a question of opportunity, which is consistent with the results of Rozon's (1987) qualitative studies. Rozon emphasized that while gamblers' offending is a last resort, it is also an opportunistic act that depends on the opportunities available in the gambler's environment. In summary, the detailed analysis of illegal income strongly suggests that participants who committed crimes did so because offending was something they were familiar with and proficient at. In fact, many participants justified their failure to offend in terms of ignorance of how to do so (absence of criminal opportunity) or moral considerations (as one participant said, "I may have a lot of faults, but I'm not a crook.").

Our results provide no support for the existence of a single career or single developmental profile. In this, they concord with those of Blaszczyński and Nower (2002), who demonstrated that gamblers constitute a heterogeneous population. It would be particularly interesting to continue the reflection in the light of pathways model advance by Blaszczyński and Nower. One could, for example, examine the effect of life circumstances (conventional and deviant) according to the different types of gamblers identified, but also the prevalence of certain behaviours (such as crime) within each of these types. In the end, there appears to be many profiles. Are the consequences of problem gambling the same for all gamblers? It is quite possible that the answer is no. This is not to underestimate the psychological suffering caused by gambling, but it does legitimate the hypothesis that life circumstances may modulate the repercussions of this passion.

The approach taken in this study is not without limits. One limitation of the hierarchical approach is that it does not allow the consideration of rare life circumstances. Deaths, divorces or suicide attempts are too rare events in most of life paths (especially in a short-term perspective) to lend themselves to such an analysis. Another limitation of this study is its inability to capture the duration of the identified effects. Does the duration of the effect that accompanies therapies fade after a certain time? Furthermore, retrospective designs can be riddled with threats to validity. The quality of the data collected depends on the memory of the

participants and when relying on individual recall, recall may be inaccurate and subject to biases.

Our results are exploratory and we also cannot claim that our sample is representative of individuals with gambling problems. The recruitment process imposed certain limitations: for example, it is quite plausible that the gamblers who are most criminally active are to be found behind prison bars, rather than in therapists' offices. On the other hand, the selection process did have certain advantages: therapy leads individuals to be more open and realistic about their experiences, and to explain their behaviours more honestly. Although our results cannot be generalized, the sample was nevertheless adequate for the analysis of the impact of selected life events on the intensity of gambling.

Conclusion

This study revealed the importance of analyzing the dynamics of gambling behaviour. Using three parameters (relative losses, periods of abstinence, relapses) that describe gambling behaviour over a 36-month period, it demonstrated that problems gamblers' individual trajectories are volatile and intermittent. Moreover, the results revealed the impact of life circumstances on these trajectories. On the one hand, sources of social control—hours worked, participation in therapy—create the effect of alleviating gambling problems. On the other hand, deviant life circumstances—commission of lucrative crimes, consumption of psychoactive substances, paying of gambling debts—exacerbated gambling. These latter results suggest a strong and ongoing association between gambling behaviour and other deviant behaviours.

This research has practical implications, as its identification of factors that predict changes in gambling behaviour supports the development of intervention policies. For example, interventions that favour a return to school, discontinuation of loan shark loans, and detoxification therapy should have indirect benefits. Our diagnosis is, of course, provisional, and subject to the usual caveats, especially because the participants in this study were all in therapy. Therefore, they may have been better adapted, more “recoverable,” and more committed to turning their lives around, and may have more resources at their disposal.

The results of this study provide yet more support for the position that exploration of dynamic factors is the most promising approach to understanding problem gambling. A further step would be to analyze gambling trajectories as a function of another deviant trajectory—criminality. In fact, it is a fair bet (if the choice of words can be excused) that an examination of the interrelation of these two trajectories will shed light on the evolution of both types of deviant behaviour. It would be interesting to establish which factors distinguish criminal offending from non-criminal offending within problem gamblers, to assess the impact of conventional and deviant lifestyle circumstances on criminal offending. Finally, it could be compelling to seek to uncover the sequential logic linking pathological gambling and criminal offending to determine which behaviour precedes the other.

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Self-exclusion and imposed exclusion as strategies for reducing harm: Data from three Swiss Casinos

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Abstract

Swiss gambling legislation is unique in that it includes health concerns and obligations for gambling operators. Specifically, the operators are required to provide social measures for the prevention of problem gambling. Moreover, gamblers with financial problems must either be banned from all casinos in Switzerland or exclude themselves. This study examines the reasons that lead to the application for a voluntary exclusion. It also considers to what extent excluded gamblers circumvent their respective prohibitions. Furthermore, it aims to identify the self-reported reasons why gamblers seek to lift the exclusion. The present study is the first of its kind to examine these questions, using data provided from three Swiss Casinos. A first step in the study involved analyzing the data obtained by trained Shift Managers during interviews with 8,170 gamblers, with the interviews taking place between 2006 and 2015. An invalidated casino questionnaire, based on DSM-IV criteria, was also completed by 3,650 participants from this sample. A second step involved evaluating forms. These forms were the documents completed during interviews with 1,005 gamblers who had successfully applied to have their interdiction terminated, with the person responsible for implementing social measures completing the forms. The findings indicated that most players had found other ways to gamble, during the exclusion period. The main reason gamblers gave for wishing to remove their ban was wanting to be able to visit a casino again. The possible reasons for this discovery are discussed, alongside the benefits and drawbacks of using industry-generated data.

Keywords: self-exclusion, imposed exclusion, harm reduction, problem gambling, prevention

Résumé

La législation suisse sur les jeux est unique en ce sens qu'elle inclut les problèmes de santé et des obligations pour les opérateurs de jeux. Plus précisément, ces derniers

sont tenus de prévoir des mesures sociales pour prévenir la dépendance au jeu. De plus, les joueurs qui ont des problèmes financiers doivent soit être exclus de tous les casinos suisses, soit s'en exclure de manière volontaire. Cette étude examine les raisons qui sous-tendent la demande d'exclusion volontaire. Elle examine également dans quelle mesure les joueurs exclus contournent leur exclusion et elle vise à déterminer les raisons invoquées par les joueurs pour demander la levée de l'exclusion. La présente étude est la première du genre à examiner ces questions, en utilisant les données fournies par trois casinos suisses. Une première étape de l'étude a consisté à analyser les données obtenues auprès de 8 170 joueurs par des chefs de quart qualifiés, entre 2006 et 2015. De cet échantillon, 3 650 participants ont également répondu à un questionnaire non validé sur les casinos, basé sur les critères du DSM-IV. Une deuxième étape a consisté à évaluer les formulaires que la personne responsable de l'application des mesures sociales avait remplis lors d'entretiens auprès de 1 005 joueurs qui avaient réussi à faire lever leur exclusion. Les résultats indiquent que la plupart des joueurs ont trouvé d'autres moyens de jouer pendant la période d'exclusion. La principale raison invoquée par les joueurs pour la levée de leur exclusion est qu'ils souhaitaient pouvoir se rendre à nouveau dans un casino. Nous discutons des raisons possibles de cette situation, ainsi que des avantages et des inconvénients de l'utilisation de données générées par le secteur.

Introduction

The ratification of the new Casino Act in 2000 marked the end of the decades-long ban on casinos in Switzerland. Today, Switzerland's gambling market includes not only the lottery and betting sector but also the casino sector—the former being subject to the 1923 Federal Act on Lotteries and Commercial Betting (Lottery Act) and the latter the 1998 Federal Act on Games of Chance and Casinos (Casino Act) (Häfeli, 2009). Today, 21 casinos operate in Switzerland, institutions which offer a range of gaming tables and slot machines. Online gambling remains prohibited at this time but will be legal as of 2019. Gambler protection is exceptionally important in Swiss society, and few other countries maintain such stringent legal provisions for identifying and preventing problem gambling behaviour in casinos. To this end, the independent Swiss Federal Gaming Board (SFGB) supervises casinos in Switzerland and is responsible for enforcing the Casino Act and the associated ordinances for reducing, through social measures, the socially harmful effects of gambling. Before obtaining a license, each casino must develop a clear prevention strategy for gambling addiction, which includes training the personnel in charge of social measures, and collecting data relating to gambling addiction. One important approach involves the early detection of problem gambling. For this, casino staff must follow guidelines and use checklists to identify at-risk gamblers and engage them in dialogue. This approach aims to help casinos to implement appropriate intervention measures. Accordingly, when potential problem gamblers are identified,

the casino staff can then ask them for a salary or bank account statement or another valid and relevant document. Gamblers who fail to present proof of sound financial status and whose stakes when gambling are disproportionate to their assets must be banned from all Swiss casinos (Billieux et al., 2016). Bans are imposed if proof or strong suspicion can be found to indicate that, because of their gambling actions, specific gamblers are maintaining excessive debts, holding stakes that are unequal to their financial circumstances, or experiencing other disruptions. On the other hand, gamblers can also ask to be self-excluded. Spouses and partners can also ask the casinos to stop their immediate relations from entering casinos. In such circumstances, it is the casino that is then legally obliged to investigate and clarify whether the preconditions for an imposed ban are fulfilled. Generally, concerns raised by a spouse or partner lead to an imposed exclusion by the casino. The ban applies throughout Switzerland, and the casino must share the gambler's identity with all the other Swiss casinos, regardless of whether the ban is voluntary or imposed. In Switzerland, electronic access systems and ID checks can help to enforce bans, which in principle are open-ended. A gambler can ask for a ban to be lifted one year after it was imposed, at the earliest. This procedure is a complex one, a process that requires proof of a healthy financial situation (Häfeli, 2009). In principle, no consequences should flow from the lifting process because of whether the ban was imposed or voluntary.

Exclusions—as above, whether imposed or voluntary—are designed to limit potential damage from gambling, deter gamblers from placing disproportionate bets, and provide support, while at the same time addressing issues specifically relating to the person's behaviour. The trend of using exclusions has been exceptionally steady ever since casinos became legal in Switzerland, with just over 3,200 persons being banned annually and roughly 10% of the bans being lifted again. At the end of 2017, Switzerland's nationwide exclusion register comprised 53,920 names (Swiss Federal Gaming Board, 2018), a relatively large number compared to those of the neighbouring countries with larger populations. The German database of gamblers banned from gambling and lotteries had only 32,989 persons as of 2016 (Meyer, 2017). Contrary to popular belief, most problem gamblers in Switzerland choose to bar themselves voluntarily. A study conducted in 2010 showed that 70% of those gamblers excluded had excluded themselves and 30% had been barred by the casinos (Häfeli & Lischer, 2010). Despite the high number of exclusions in Switzerland, prevention measures—including the Swiss practice of serving exclusion orders—have not been comprehensively studied. More specifically, few empirical studies have been conducted in Switzerland, a country which excludes gambling addiction or gamblers' decisions to self-exclude (Carlevaro, Lischer, Sani, Simon, & Tomei, 2017).

Internationally, researchers have conducted several studies concerning self-exclusion programs, as a measure of harm reduction (for a review, see Gainsbury, 2014; Ladouceur, Shaffer, Blaszczynski, & Shaffer, 2017; Suurvali, Hodgins, & Cunningham, 2010). Whereas most studies find financial problems and the inability to control gambling to be the main reasons for self-exclusion (Abbott, Francis, Dowling, & Coull, 2011; Hayer & Meyer, 2011; Hodgins, Makarchuk, Guebaly, & Peden, 2002;

Ladouceur, Jacques, Giroux, Ferland, & Leblond, 2000; Ladouceur, Sylvain, & Gosselin, 2007; Nelson, Kleschinsky, LaBrie, Kaplan, & Shaffer, 2010), Nower & Blaszczynski (2006, 2008) instead reported that self-excluders act as they do because they realize they need help to control their gambling problem. Ladouceur and colleagues (2007) pointed out that the majority (90.7%) of the self-excluded gamblers were motivated by a specific event, one which led them to join a self-exclusion program. Hayer and Meyer (2011) conducted the first study of its kind to examine the effectiveness of self-exclusion schemes. This project involved the casino sector across several European countries. To determine the circumstances leading to a voluntary removal, the authors used the Swiss Casino Data Management System. The device is employed for the self-exclusion process in Swiss casinos and includes lists with twelve possible motives for the exclusion. From their sample, 76.2% of the respondents stated that they had applied for a voluntary exclusion because they had lost too much money in the casino, and 60.3% indicated that they applied for it as a preventive measure. Just over half of the respondents noted that they had lost control of their gambling (53.6%) (Hayer & Meyer, 2011). It should be stressed that this study was the first to find a so-called preventive reason to be the motive for self-exclusion: In contrast to Anglo-Saxon countries, certain European casinos (e.g., in Germany or Switzerland) are required by law to offer specific “preventive measures” that identify problem gamblers at an early stage.

Previous studies only examined self-excluded participants who had already recognized their gambling problems, and who were willing to deal with them accordingly. However, a recent study conducted in Germany assessed for the first time whether imposed exclusion is possibly associated with fewer benefits compared to self-exclusion. The study revealed that gamblers with imposed exclusions reported having spent more time and money on gambling, before the exclusion, compared to self-excluders. Nonetheless, imposed exclusion was not associated with a greater reduction in gambling when compared to cases of self-exclusion. Instead, similar rates of abstinence and gambling reduction for those participants with an imposed or self-exclusion were determined. Overall, results indicated that 20.5% of those gamblers excluded stopped all gambling activities and another 66.5% instead reduced their gambling. Those persons who continued gambling significantly reduced this behaviour in every segment. Findings indicate that self-imposed exclusions were associated with similar reductions in gambling behaviour, even in other segments, where the ban was not imposed (Kotter, Kräplin, & Bühringer, 2017). To the best of our knowledge, no research has thus far been published concerning the differences in effectiveness of either family or casinos exclusions. However, Kotter et. al.’s findings provide counter-intuitive evidence of effectiveness even when the exclusion is involuntarily imposed.

Earlier research has highlighted studies have highlighted the fact that almost all participants who signed self-exclusion agreements were potential pathological gamblers (95%) (Ladouceur et al., 2000). However, more recent studies suggest that certain non-pathological, at-risk or problem gamblers may also choose to take advantage of the program and apply for voluntary exclusion. Such a determination

may be done for various reasons, including awareness of early signs of a developing problem (Blaszczynski, Ladouceur, & Nower, 2007). Kotter and colleagues revealed, that 61% of their sample of excluded gamblers (imposed or voluntary) were potential pathological gamblers (4 – 9 DSM-5 criteria), whereas 18% fulfilled 1 – 3 criteria. 21% did not fulfill any of the DSM-5 criteria (Kotter, Kräplin, & Bühringer, 2016).

In a recent meta-analysis on self-exclusion, Ladouceur, P. Shaffer, Blaszczynski and H. Shaffer (2017) concluded that this measure demonstrates some effectiveness as a component of responsible gambling (RG) programs. This determination is useful despite various limitations including low-uptake rates, breaching the agreement, and minimal evidence for the long-term outcomes. However, in the Swiss gambling environment, the problem of low uptake rates for self-exclusion is not appropriate. This situation is because the problem of gamblers who circumvent the bans is here virulent. Still that certain excluded gamblers circumvent their bans is a known phenomenon (Blaszczynski et al., 2007; Croucher, Croucher, & Leslie, 2006; Ladouceur et al., 2000, 2007). Today, casinos in neighbouring countries consider barred gamblers from Switzerland to be a significant source of revenue. It can also be assumed that at least certain number of such gamblers circumvent their exclusion by visiting illegal gambling venues in Switzerland, or by taking advantage of foreign online gambling sites (Lischer, Häfeli, & Villiger, 2014). However, to date, no information is available on the extent to which excluded gamblers in Switzerland circumvent their respective bans.

Objectives and research questions

As mentioned above, each Swiss casino was legally obliged to collect data concerning gambling difficulties. Access to such large-scale data offered unique insight into problematic gambling and exclusion for this otherwise often inaccessible population. This study therefore aimed to use such existing data to:

- determine the self-reported reasons leading to the application for a voluntary exclusion.
- identify voluntarily-excluded gamblers' self-reported casino gambling problems.
- explore to what extent alternative forms of gambling are used during the exclusion period.
- understand the motivations for seeking to lift the exclusion.

Method

Participants/Sample

Whereas the implementation of social safeguards is mandatory for Swiss casinos (Häfeli & Lischer, 2010), differences nonetheless exist in the implementation of the player protection processes between the different casinos. To ensure the comparability of the data, the study examined three casinos, all of which used the same data collection tools for the exclusion and exclusion-lifting process. All were supervised by

the Swiss Gaming Board, which ensures reliability in their chosen data collection practices. After a request, the directors of the three casinos consented that the data could be used for the purpose of this research.

The analyses described below were based on self-reports obtained from two samples of excluded gamblers. Sample 1 involved gamblers who were questioned by trained casino shift managers when seeking a voluntary exclusion. Here, only voluntary exclusion interviews were used, as operator-excluded gamblers often failed, upon request, to present proof of their sound financial status, and consequently did not complete an interview. Sample 2 included gamblers interviewed by the person responsible for implementing social measures whose application to lift an exclusion had been successful. (The original exclusion was either imposed or voluntary.) In those cases where a degree of overlap inevitably occurred between the samples, most participants only appeared in one or other of the two data sets. It is therefore most appropriate to consider these samples as distinct from each other.

The collection of data relating to the social safeguards measures was obligatory and supervised by the Federal Board. This standardized procedure has been consistently implemented over a period of at least 10 years. The data used in the study comprised the period from January 2006 to December 2015.

Materials and Procedure

Questionnaire. According to the Gambling Act and to its dispositions, casinos should register the reason or reasons that led to exclusion. Furthermore, the government obligates casinos to collect data relating to gambling addiction. The casinos themselves can decide how they will fulfill this obligation. The three casinos participating in this study all used a questionnaire, based on the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) (hereinafter “Questionnaire on Gambling Behavior”), which aimed specifically to collect information on those specific behaviours which might be considered problematic. This information was culled from a set of 10 questions relating to gambling. However, the questions have been adapted to suit better a casino context (see Table 2, results section for the list of questions). We should also highlight that this tool was not validated following its adaptation. Furthermore, no clinician reviewed the answers, and thus the tool the tool did not in fact provide diagnostic classification, but rather an overview of the participants’ self-reported difficulties in relation to their casino gambling instead. The questionnaires were completed during the initial self-exclusion interviews. The data therefore related to those players seeking a voluntary exclusion (Sample 1).

Termination interviews. Furthermore, we evaluated the notes taken by the person responsible for social measures, when interviewing gamblers who wanted to have their exclusions lifted. To follow the four-eyes principle, a counselor from an addiction center participated in the interview and provides expert interpretation concerning the final decision. The interviews were conducted with both gamblers

with an imposed and a voluntary exclusion (Sample 2). The exclusion termination interviews followed standardized forms for open-ended and closed-ended questions concerning sociodemographic characteristics, gambling behaviour before and after the exclusion, and the reasons why the individual was applying for the exclusion to be lifted. The data generated were categorized into one of a possible 17 qualitative and quantitative variables, by two raters. They were then recorded electronically and used for answering research questions 1 and 2 (above). To demonstrate consistency among observational ratings provided by two raters using the same coding system (interrater reliability), we coded 10% of the minutes ($n=100$) twice, i.e., both raters coded the same cases. Afterwards, a measurement of the extent of agreement was obtained for each of the 17 variables (Cohen's Kappa). The medium consistency of the raters was high (Median Kappa = 0.79). In the case of variables with a lower consistency, the respective cases were discussed, and any ambiguity was eliminated from the coding system.

Data analysis

Data analysis involved descriptive statistics and several significance tests, conducted with SPSS for Windows (Version 24.0). Statistical relationships were analyzed with Pearson's chi-square test (χ^2) for nominal scale variables. Furthermore, a non-parametric Kruskal-Wallis test with subsequent pair-wise post-hoc analysis was used to examine the correlation between the frequency of monthly visits and the reasons for exclusion. The adjusted future gambling behaviour was evaluated based on a Wilcoxon signed-rank test. Two-sided tests, each with the significance level set at $<.05$, were used to test the hypotheses.

Results

Motives for voluntary exclusion

Between 2006 and 2015, the three casinos mentioned above issued 8,170 voluntary exclusion orders. The exclusion rate was roughly equal for each casino and relatively stable over the 10-year period. The reasons that gamblers gave for self-exclusion were analyzed first. During the self-exclusion interview, the gambler indicated his or her reasons, from a list of 11 options, predefined in the Swiss Management System. The overall percentages over the ten years can be seen in Table 1. We should highlight that multiple responses were possible, should participants wish to report more than one reason for seeking an exclusion.

The presentation of the results of multiple response questions is generally difficult because the results are not straightforward and easy to understand. We have therefore chosen a simplified version, one which consists of calculating the percentage of participants who chose each statement, and also reporting the total number of responses given (presented as a percentage). This total percentage is greater than 100 (157.6%), a result which demonstrated that more than one response was frequently given.

Table 1
Reasons for self-exclusion (multiple answers possible)

Reasons for self-exclusion	Absolute frequency	Percentage*
Lost too much money at the casino	3,812	46.7
Needed the exclusion as a preventive measure	2,852	34.9
Spent too much time at the casino	1,733	21.2
Had lost control	955	11.7
Had financial problems because of casino gambling	616	7.5
Was in debt because of casino gambling	534	6.5
Placed bets that had no relation to my income/wealth	388	4.7
Was asked to do so by my family and friends	324	4.0
Had family or relationship problems because of casino gambling	324	4.0
Had problems at work because of casino gambling	68	0.8
Failed to live up to a commitment	30	0.4
Other	1,242	15.2

* Multiple answers were possible. Percentages therefore total more than 100.

Various indicators, such as time and money spent on casino gambling, and having lost control, imply that the respondents' gambling had become excessive. The most common reason for voluntary exclusion was "Lost too much money at the casino." The second most common reason was "Needed the exclusion as a preventive measure." In contrast, respondents mentioned family or work problems much less frequently.

Gambling-related problems and voluntary exclusions

Whereas completing the questionnaire about the motives for a voluntary exclusion, and providing information about themselves, was mandatory, completion of the Questionnaire on Gambling Behaviour was instead optional. Under these circumstances, only 44.7% ($n=3,650$) of the gamblers undertaking a voluntary exclusion interview (Sample 1) completed the questionnaire. Although incomplete, these data provide some insight into the extent of gambling-related problems for this subset. On average, 33.7% of gamblers seeking voluntary exclusion met 0–2 of the questionnaire criteria per casino and year. Furthermore, 39.0% of the gamblers surveyed met 3–4 criteria, while 27.3% met 5 or more such criteria.

The study then focused on the percentage of those participants who agreed with the items from the Questionnaire on Gambling Behavior (see Table 2). The self-excluded gamblers agreed most often to the questions "When gambling, do you often try to win back the money you lost?" and "Do you frequently gamble for longer than planned?" Gamblers almost never indicated having lost an important relationship or job because of their playing, or that they had eliminated or lessened gambling debts through illegal means. Gambling-related problems at the time of a voluntary exclusion may therefore be more likely be related to personal factors (e.g., lost too

Table 2

Percentage of positive responses to items in the Questionnaire on Gambling Behaviour

Question	Percentage*
When gambling, do you often try to win back the money you lost?	78.7
Do you frequently gamble for longer than planned?	70.7
Have you noticed any changes in your behavior, such as placing larger bets or spending more time at the casino?	62.2
Do you frequently think about going to the casino?	41.2
When you lose more than you can afford, do you ask close family members or acquaintances for financial help?	28.6
Do you become nervous or restless when you go to the casino less frequently or take less betting money with you?	25.5
Do you frequently gamble to escape from other problems?	13.4
Have you ever claimed to have won when in fact you lost money?	13.2
Have you ever lost an important relationship, job, apprenticeship, or promotion because of gambling?	5.5
Have you ever tried to cover gambling debts illegally?	1.5

* The data basis is formed by the values of all casinos over the entire survey period. Multiple answers were possible. Percentages therefore total more than 100.

much money, spent too much time at the casino), and may not yet affected the person's family members or colleagues at work.

Evaluation of the application of those gamblers requesting for their exclusion to be lifted

The second step in this study was to evaluate the data for those gamblers who applied to terminate their exclusion (Sample 2). This process involved the applicant submitting his or her documents (salary statement, debt enforcement registers, etc.) to provide proof that the reason for the exclusion no longer existed. In cases where this documentation was accepted as proof, the applicant was then invited to an interview to ensure that he or she was deemed ready to return to the casino. Depending on the outcome of the interview, the exclusion was either to be lifted, or left in place. The man or woman responsible for social measures and a specialist from an addiction-center were the two persons responsible for the interviews.

During 2006 and 2015, 3,670 applications for lifting the exclusions were registered in the three casinos. 1,275 applications were deemed to have provided sufficient documentary proof and were therefore invited to interview. Of these, 1,064 (80%) subsequently had their exclusions lifted, and we were given access to 1,005 interview forms from this sample (95.5% of the successful applicants). Most of the exclusions ($n=1005$) were voluntary ($n=891$; 88.7%) as opposed to imposed ($n=111$); three cases were missing. The youngest gambler was 19 years old at the time of the interview; the oldest 82 ($Md = 37$). 25.2% were female and 74.8% male. There were no significant gender differences ($\chi^2 = 2.701$, $p = .10$) in the exclusion type. Voluntary exclusions were more frequently lifted than imposed ones ($\chi^2 = 7.169$, $p = .007$). It was

impossible to calculate the mean duration of the exclusion because some interview notes did not include the date.

Alternative forms of gambling. The data from exclusion termination interviews show that gamblers make extensive use of alternative gambling opportunities during their exclusion, mainly at casinos abroad. Exclusion orders are therefore ineffective in forcing most gamblers to abstain from gambling. Almost 90% of those respondents looking to have their exclusion orders lifted engaged in other forms of gambling (59.7% at casinos abroad; 21.2% in lotteries; 6.9% other). Only 12.2% of the applicants claimed not to have used alternative forms of gambling. The study found no gender differences in this regard: Both men and women sought other opportunities to gamble ($\chi^2 = 7.127$, $p = .068$). Nevertheless, this finding must be interpreted cautiously. Only 61% ($n=613$) of those participants seeking readmission to Swiss casinos—i.e., by those persons who wanted to gamble again—did in fact answer the question.

Reasons for applying to lift an exclusion. This question was answered by 99.8% ($n=994$) of those gamblers seeking readmission to Swiss casinos. The main reason respondents gave for wishing to have their exclusion order lifted was wanting to be able to visit the casino again (42.1%) or social reasons (39.4%). Many participants also reported experiencing social pressure to visit a casino, e.g., for a Christmas party with the company (10.0%). As mentioned earlier, 60% of gamblers claimed to have visited casinos during their exclusion, often ones immediately across the Swiss border, and thus involve only little extra travel. Therefore, “casino visits abroad are too time-consuming” is almost never indicated as a reason (only 5.6%). Almost one in five gamblers felt that their personal freedom was constrained by the exclusion and therefore wished to terminate it (desire for self-determination) (17.4%). Furthermore, 7.4% of the players claimed to control their gambling behaviour, to have enough financial means (3.0%) or other reasons (10.7%).

Discussion

Motives for the voluntary exclusion

The most frequently named reasons for a voluntary exclusion are having “lost too much money in the casino” and having applied for a voluntary exclusion for “preventive reasons.” These findings correspond with the results from Meyer and Hayer’s study (2011). Only a few players (4.7%) indicated family pressure as the reason for requesting a voluntary exclusion. Thus, the findings do not allow for firm conclusions to be drawn concerning the role that family members play leading up to the exclusion. As mentioned above, research into third party or specifically family-initiated exclusion is highly limited (Goh, Ng, & Yeoh, 2016). Thus, further research into this area is required.

As mentioned above, gamblers with an imposed exclusion are not interviewed in the exclusion process. However, it can nevertheless be assumed, that the reasons

for the exclusion, as defined in the Swiss Gaming Act (concerning gamblers with excessive debt, stakes disproportionate to their financial circumstances, or both) are genuine.

Gambling-related problems and voluntary exclusions

The study's evaluation of the Questionnaire on Gambling Behaviour provides insight into the extent of problems caused by gambling. The findings therefore indicate that one-third of gamblers seeking voluntary exclusion exhibit low-level problems in relation to their casino gambling, while two-thirds report more troubling problems. It should be noted that only 44.7% of self-excluders filled out the questionnaire on addiction. We can only speculate about the reasons why, for certain players, this section was not completed. The decision could have been because of their wish to avoid facing the extent of the situation or, conversely, because of staff members not having proposed the questionnaire. Given the potential implications for staff training, these possibilities highlight an important area for further investigation. Given that highly emotional moments often precede the person asking to be excluded, it cannot be ruled out that gamblers are not representing their situation accurately. Either they are exaggerating or trivializing their situation. Their decision, whichever one it was, may have influenced the low rate of self-reporting for illegal activities (to cover gambling debts), loss of employment, or an important personal relationship.

Evaluation of the application of those gamblers requesting for their exclusion to be lifted

Evaluation of the data generated during exclusion termination interviews reveals the following. During their exclusion, the gamblers made extensive use of alternative gambling opportunities, mainly casinos abroad. Exclusion orders therefore do not lead most of the gamblers to abstain from gambling. Almost 90% of those gamblers applying to have their exclusion orders lifted had availed themselves of other forms of gambling. It should be noted that this question was answered by only 61% ($n=613$) of applicants. Furthermore, the applicants are seeking readmission to Swiss casinos, i.e., they want to participate in gambling. Not all excluded gamblers share this wish: Many excluded gamblers remain abstinent or lose interest. In that respect, the aforementioned 90% are not representative of all excluded gamblers. Despite this caveat, it can be assumed that a substantial number of the excluded gamblers circumvent their exclusion by availing themselves of alternative forms of gambling. This finding is consistent with other studies. With regard to this issue of circumvention of exclusion orders, the question arises as to whether any complementary measures exist that are capable of preventing this behaviour. Because many gambling dens reside close to the Swiss border, the idea of gambling elsewhere being too "time-consuming" was almost never provided as a reason for lifting the exclusion. The majority of the players claimed social reasons or, not surprisingly, the wish to visit a casino again as a reason for seeking a lifting of the exclusion.

Limitations

The study analyzes the characteristics and experience of a substantially large number of individuals excluded in Switzerland, where exclusion can be voluntary or mandatory. Furthermore, this inquiry considered data spanning a period of 10 years, providing insight into a population otherwise hard to reach. Nevertheless, acquiring data from gambling operators may be problematic: thus, caveats cannot be ignored. The data were collected for the casinos in compliance with their legal requirements, which limited the possibilities for obtaining and evaluating specific data for research purposes. Thus, the questionnaires are relatively rudimentary and no elaborate survey methods were used. In the same vein, the Questionnaire on Gambling Behaviour had been adapted for use within the casinos to gauge the extent of gambling problems and was therefore not a clinically validated tool. Furthermore, certain variables are missing, that would have been useful for this study, e.g., the duration of the exclusion or sociodemographic characteristics of the voluntarily-excluded gamblers, gambling behaviour and gaming preferences, etc. These variables can be seen as confounding, and therefore, the inability to control them, must be stressed as a limitation. Elsewhere, gaps resided in the data: For example, with the 1,064 interviews resulting in an exclusion being lifted, only 1,005 forms were available for analysis, and we cannot know what happened to the remaining 49 forms. Similarly, at other times, respondents chose not to reply to certain questions: for example, only 44.7% of the sample agreed to complete the Questionnaire on Gambling Behaviour during the self-exclusion interview.

In view of the data, we need to consider that gamblers' requests for voluntary exclusion were often preceded by an exceptionally emotional moment, and that they may have accordingly described their situation inaccurately. Considering it was casino employees who conducted the interviews, it cannot be ruled out that gamblers misrepresented their respective situations.

It should be stressed that the answers given by individuals who wanted to revoke their exclusion with regard to their future gambling behaviour was open to response bias (social desirability). Furthermore, the question concerning the use of alternative forms of gambling was related to past gambling behaviour (these may be affected by a recall bias), and the information was based on notes taken by the person responsible for social measures. Moreover, no data were available on the average length of the exclusion so it is possible that participants are recalling information several years after the original exclusion. The results must thus be treated with appropriate caution.

Another important limitation was that the notes taken during the exclusion-termination interviews included only those gamblers with a stable financial situation (no debts) whose exclusion was ultimately lifted. Consequently, there is still a considerable lack of research on the behaviour of excluded gamblers with unstable financial circumstances. While this study provides some unique insight into self-reported gambling and exclusion, more targeted, research could be useful to explore the questions raised.

Conclusions and recommendations

During those interviews, 35% of those participants seeking voluntary exclusion reported doing so for preventive reasons. To date, researchers have not examined the impact of the social safeguards in Swiss casinos. It would be interesting to explore the effectiveness of preventive measures upon awareness of problem gambling, both by the gamblers and the employees. Nevertheless, Swiss casinos, with their preventive social measures, constitute a special case in the world of international gambling. Such a position is particularly the case with training employees in the early detection of problem gamblers.

Evaluation of the notes taken during the exclusion termination interviews reveals that many gamblers served with exclusion orders find other ways of continuing to gamble. As a result, the overarching objective of Switzerland's exclusion policy—an enduring abstinence from gambling—needs in turn to be modified. The question then arises as to whether exclusions should be the only means of protecting gamblers who are deemed to be at risk. The possibilities for individual limitations on the frequency of visits, or the stakes, should both be discussed as another measure of player protection.

Despite its numerous limitations, this study demonstrates how access to data from the gambling industry can provide important information for prevention efforts. Data from the gambling industry provide access to problem gamblers who are not in treatment, thus broadening the target population otherwise limited on one hand to patients in treatment centers and, on the other, on gamblers who, first, need to be identified, and second, agree to participate in a survey (Carlevaro et al., 2017). We should note that this study would not have been possible without the Swiss Confederation's legal provisions, with regard to problem gambling prevention and to industry data. These provisions clearly contribute to the fulfilment of the “responsible gambling” principle that prevention programs need to be evaluated and monitored (Blaszczynski et al., 2011; Blaszczynski, Ladouceur, & Shaffer, 2004). Evidence is necessary for the effective deployment and development of the exclusions, as an important measure for safeguarding gamblers.

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Perceptions of Problem Gambling Among Methadone Maintenance Treatment Clients and Counsellors

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Abstract

Problem gambling is highly prevalent and rarely treated among clients who attend methadone maintenance treatment programs (MMTPs). Compared with those of the general population, rates of gambling disorder have been found to be elevated among individuals receiving methadone maintenance treatment. Our study aims were to (a) develop a clearer understanding of the gambling experience of clients and counsellors at a methadone clinic and (b) gain insight into the current treatment options and obstacles to treatment in the clinic. Semi-structured interviews focusing on gambling issues were conducted with 8 clients and 8 counsellors at an MMTP located in an urban area. Participants were asked questions to gain an understanding about their perspectives on, treatment options for, and treatment barriers to problem gambling in the clinic. Data were coded by 4 investigators by using a constant comparison, open coding approach. The findings revealed important differences between clients and counsellors: Opinions differed on the definition of problem gambling, obstacles to treatment, and optimal treatment settings. Clients and counsellors also agreed on some elements, including the negative impact that problem gambling can have on recovery from substance use. This examination of responses of counsellors and client feedback provides a useful mechanism to better understand problem gambling in MMTPs. In addition, the findings have important clinical implications, including a need for more effective screening and treatment in MMTPs and to provide substance use counsellors with training related to problem gambling.

Keywords: problem gambling, gambling disorder, methadone maintenance treatment, gambling treatment

Résumé

Le jeu compulsif est hautement répandu et rarement traité parmi les clients qui suivent un programme de traitement d'entretien à la méthadone. Comparés à ceux de la population en général, les taux de jeu pathologique ont jugé élevés chez les personnes qui suivent un tel traitement. Les objectifs de notre étude étaient de deux ordres : a) mieux comprendre l'expérience de jeu des clients et les connaissances en cette matière des conseillers d'une clinique de traitement à la méthadone, et b) avoir une meilleure compréhension des options de traitement actuelles et des obstacles au traitement en clinique. Des entretiens semi-structurés portant sur les problèmes de jeu ont été menés auprès de 8 clients et de 8 conseillers dans un centre de traitement, situé en zone urbaine. On a posé des questions aux participants pour mieux comprendre leurs points de vue sur les options et les obstacles au traitement contre le jeu problématique à la clinique. Les données ont été codées par quatre chercheurs en utilisant une approche de codification ouverte à comparaison constante. Les résultats ont révélé des différences importantes entre les clients et les conseillers : les opinions divergeaient quant à la définition du jeu problématique, les obstacles au traitement et les paramètres de traitement optimaux. Les clients et les conseillers ont par ailleurs été d'accord sur certains éléments, notamment l'impact négatif que le jeu problématique peut avoir sur le rétablissement d'une consommation abusive. L'examen des réponses des conseillers et des commentaires des clients constitue un mécanisme efficace pour mieux comprendre le jeu problématique dans les programmes de traitement d'entretien à la méthadone. De plus, les résultats ont d'importantes répercussions cliniques, notamment la nécessité d'un dépistage et d'un traitement d'entretien à la méthadone plus efficaces et d'une formation sur le jeu problématique pour les conseillers en toxicomanie.

Introduction

Gambling disorder is highly prevalent and rarely treated among patients receiving methadone maintenance treatment, with rates of this disorder ranging from 7% to 52.7% among those in methadone maintenance treatment programs (MMTPs; Elman et al., 2016; Himelhoch et al., 2015; Leavens, Marotta, & Weinstock, 2014; Feigelman, Wallisch, & Lesieur, 1998; Spunt, Lesieur, Hunt, & Cahill 1995; Spunt, Lesieur, Liberty, & Hunt, 1996; Weinstock, Blanco, & Petry, 2006). For this study, the term *gambling disorder* is used to refer to those who meet four or more criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*;

American Psychiatric Association [APA], 2013) and the term *problem gambling* to refer to participants who do not meet the diagnostic threshold. Among MMTP patients, the combined prevalence rates of problem gambling and disordered gambling ranged from 17.7% to 30% (Elman et al., 2016; Himelhoch et al., 2015, 2016; Ledgerwood & Downey, 2002; Leavens et al., 2014; Spunt et al., 1996). In contrast, the rate of gambling disorder among the general population ranges from 0.4% to 4.2% (Lorains, Cowlishaw, & Thomas, 2011; Shaffer & Hall, 2001). Given that rates of gambling disorder are approximately 13-18 times higher among those receiving methadone maintenance treatment than among the general population, treatment for this disorder should be addressed in MMTPs.

Several studies have shown evidence that gambling disorder is associated with negative effects on patients' engagement in substance use treatment (Leavens et al., 2014; Ledgerwood & Downey, 2002). Studies have also reported increased rates of drug use and illegal activities in clients under treatment for substance use disorder (SUD) who also meet the criteria for problem gambling. These findings present concerns that gambling may contribute to drug and criminal problems and impede recovery (Grant & Kim, 2001; Himelhoch et al., 2015, 2016; Langenbucher, Bavly, Labouvie, Sanjuan, & Martin, 2001; Spunt et al., 1996). Unlike other substance use treatment clinics, MMTPs follow a harm reduction approach. MMTP patients typically have poor general health; the goal of MMTPs is therefore to reduce the risks of drug use and improve the overall health quality of patients (Fillmore & Hohman, 2015; Puigdollers et al. 2004). Previous research has found that problem gambling among clients in methadone maintenance treatment is associated with significantly higher rates of treatment dropout and fewer total days spent in treatment (Ledgerwood & Downey, 2002; Himelhoch et al., 2016). Gambling treatment may be an important addition to MMTPs to complement other treatment strategies. With this addition to the treatment program, clients may be able to better engage in treatment and to stay in treatment longer than occurred previously, therefore continuing to lessen their risk.

Despite the negative effects that ongoing problem gambling appear to have on recovery, previous research showed a low percentage of treatment for gambling disorder during SUD treatment (14.3%; Leavens et al., 2014). Leavens and colleagues (2014) found that 26.5% of individuals reported that they needed to address gambling during their recovery and 30% had concerns that gambling could interfere with their future efforts to abstain from substances. These findings clearly indicate a need among SUD clients for treatment that focuses on problem gambling behaviours. Gambling treatment programs are scarce among the MMTP population; therefore, there is more to be learned about the effects of gambling interventions on substance abuse treatment. Petry, Rash, and Alessi (2016) reported that, in contrast to the results of previous studies, offering gambling intervention programs did not significantly affect SUD treatment outcomes. Given the limited research available about gambling interventions in substance use treatment clinics, it is unclear whether gambling interventions will have an impact on SUD treatment outcomes. However, considering the high rates of problem gambling among MMTP patients compared

with those of the general population, treatment for problem gambling within MMTPs is still advantageous.

Unfortunately, despite some clients' desire for treatment and the potential negative impacts of gambling on recovery, treatment for problem gambling for those who are in recovery is not readily available. Prior research examined the barriers to treatment among problem gamblers and found that one of the foremost barriers to initiating gambling treatment was treatment unavailability (Khayyat-Abuaita, Ostojic, Wiedmann, Arfken, Ledgerwood, 2015; Rockloff & Schofield, 2004). Even among problem gambling helpline callers who initiated treatment, treatment unavailability was reported to be the foremost barrier (17.7%; Khayyat-Abuaita et al., 2015). Several other studies have reported that individuals' feelings of shame, embarrassment, or stigma were the most significant barriers to treatment (Gainsbury, Hing, & Suhonen, 2014; Rockloff & Schofield, 2004; Suurvali, Hodgins, Toneatto, & Cunningham, 2012). Additional barriers that have been reported are participants wanting to solve the problem on their own, difficulty admitting gambling was a problem, concerns about the cost of treatment, and concerns or uncertainties about the treatment itself (Gainsbury et al., 2014, Rockloff & Schofield, 2004; Suurvali et al., 2012). Participants did not report a lack of interest in treatment as a significant barrier in any of these studies.

A qualitative research method was used for the present study, as it allows researchers to gain a deeper and more nuanced understanding of gambling in the clinic. Previous studies have used qualitative methods to discuss perceptions of problem gambling among college students, homeless individuals, and clients in substance abuse treatment and have provided information on the development of treatment interventions for each of those populations (Guilcher et al., 2016; Holdsworth & Tiyce, 2013; Punzi, Tidefors, & Fahlke, 2016; Takushi et al., 2004). This approach allows researchers to gain invaluable information about the perceptions of gambling and gambling treatment and allows for the development of effective intervention approaches that can be used to improve treatment for problem gambling in methadone maintenance clinics. In the current investigation, we sought to do the following:

1. Develop a clearer understanding of the gambling experience of clients and counsellors at a methadone clinic.
2. Gain insight into the current treatment options and obstacles to treatment in the methadone clinic.

Method

Participants

Client recruitment. As we were specifically interested in including clients with an identified problem gambling disorder as assessed by a score of 4 or higher on the *DSM-5* problem gambling questionnaire, participants were recruited from a previous study (5th ed.; APA, 2013; Himelhoch et al., 2016). Individuals were contacted for

the present study if they had participated in the previous study, which examined the rates of gambling disorder in MMTPs, and provided written permission to be contacted for future studies. Participants attended an urban university-affiliated MMTP and were paid \$30 for their participation. Interviews were conducted with eight clients, of whom 63% were female ($n = 5$) and 63% African American ($n = 5$). All participants met the *DSM-5* criteria for gambling disorder in the previous study.

Counsellor recruitment. Counsellors at the same MMTP were approached during a staff meeting and informed about the study by research assistants. Counsellors were contacted for an interview if they expressed interest in participation and provided contact information during the meeting. They were paid \$30 for their participation in the study. Interviews were conducted with eight counsellors, of whom 38% were female ($n = 3$) and 38% African American ($n = 3$).

Procedure and Materials

Semi-structured interviews. Semi-structured interviews were conducted by trained members of the research team. Participants provided informed consent prior to beginning the interviews. Client interviews took place at an off-site administrative building and counsellor interviews at the university-affiliated MMTP. Each interview lasted approximately 1 hr. All interviews were audio-taped and professionally transcribed verbatim with permission from client and counsellor participants. The present study was reviewed and approved by the institutional review board at the University of Maryland Baltimore.

In-depth interview guide. An in-depth interview guide was used that contained questions focused on clients' and counsellors' perspectives on problem gambling, opinions of screening for problem gambling behaviours in the MMTP, conversations (both clinical and informal) about gambling in the clinic, current treatment options available in the clinic, treatment approach suggestions for problem gambling behaviours, obstacles to treatment in the clinic, and problem gambling resources in Baltimore. In addition, clients were asked about types of gambling and their own personal gambling behaviours. The client interview guide is provided in Appendix A and the counsellor interview guide in Appendix B.

Qualitative Data Analysis

The research team used grounded theory for coding the data and identifying the emerging themes (Glaser & Strauss, 1967; Lapan, Quartaroli, & Riemer, 2012). Grounded theory strategies allowed researchers to use inductive processes to obtain data and develop theories on this underexplored topic (Byrne, 2001). Researchers used a constant comparison, opening coding approach. Four investigators took part in coding and analysing interview data; each interview was coded independently by two investigators. Investigators initially categorized data by interview questions, and then coded the data for each interview question. The coding process began with each

researcher entering codes and corresponding supporting text in a database. Initially, each investigator had individual databases with codes and supporting text. Codes and emerging themes established by each investigator were discussed during coding meetings. If investigators agreed on codes, the code was finalized. If investigators found any discrepancies in codes, the discrepancies were discussed by all four investigators and codes were reconsidered. After open coding was finished, researchers constructed focused codes and created a finalized database of codes and supporting text. Researchers ended data collection when saturation was reached. This coding process allowed researchers to develop a grounded theory of the perceptions of problem gambling and barriers to problem gambling treatment in the clinic. Investigators met a final time to discuss the themes that had been created, reconcile any differences in codes of themes between investigators, and create a final list of emerging themes.

Results

In-depth interviews with clients and counsellors yielded six emerging themes. Counsellors and clients shared perspectives on three of these themes: gambling as a substitute for drug addiction, gambling as a trigger for relapse, and finances as a motivator for change. Interviews produced three additional emerging themes in which clients and counsellors expressed differing perspectives: definition of problem gambling, obstacles to treatment, and treatment setting.

Gambling as a Substitute for Drug Addiction

Clients and counsellors expressed agreement that gambling is often used as a substitute for drug use. Many counsellors stated that gambling is not a major focus at the clinic, but agreed that a gambling disorder could be detrimental to a client's recovery from drug addiction. Counsellors mentioned that the thrill associated with gambling can be similar to the thrill clients achieved through drug use.

You're anticipating the psychological and physical symptoms are almost identical in terms of this anxiety level, in terms of the hand sweating, the anticipation. You still go through the same array of symptoms as if you were going to buy drugs. (Counsellor 2)

The majority of clients agreed that gambling can be used as a substitute for drug use and acknowledged that problem gambling has many similarities to a drug addiction.

... you're substituting it from one drug to really another. Not that it's a drug, but it's just as bad. You're spending money on drugs, you're spending money on gambling. (Client 3)

Table 1 shows the frequency count of the most common counsellor responses to the question, "Do you think that gambling can have an impact on your client's recovery?"

Table 1

Counsellor Responses to “Do You Think That Gambling Can Have an Impact on Your Client’s Recovery?”

Response Category	Number of Counsellors
Substituting addictions	4
Mental health symptoms	4
Relapse	2
No effect	2

Table 2

Client Responses to “How Do You Think Gambling Could Affect Someone’s Recovery From Drugs/Alcohol?”

Response Category	Number of Clients
Substituting addictions	7
Relapse	4
Compounding addiction	2
No risk of relapse	2
Preventing relapse	2

Table 2 shows the frequency count of the most common client responses to the question, “How do you think gambling could affect someone’s recovery from drugs/alcohol?”

Gambling as a Trigger for Relapse

As noted in Tables 1 and 2, counsellors and clients also reported that problem gambling behaviours not only mimic behaviours associated with drug addiction, but that problem gambling could also lead to a relapse to drug addiction. Counsellors specified that clients may be likely to use drugs both when they experience a sizable loss while gambling and when they experience a sizable win while gambling.

I think a lot of times, one of those things feeds off the other, because if they get the number, they’re going to buy an absurd amount of drugs. Vice versa. It has a crossover to it. (Counsellor 2)

Finances as a Motivator for Change

Clients and counsellors stated that financial struggles play a major role in clients’ recognition of problem gambling behaviours. Counsellors acknowledged that financial issues could be one of the clients’ only motivators for seeking change to their gambling behaviours (Table 3).

Table 3

Counsellor Responses to “What Do You Think Motivates Clients to Ask for Help With Problem Gambling?”

Response Category	Number of Counsellors
Monetary issues	4
Monetary incentive	2
Learning about problem gambling	2

Table 4

Counsellor Responses to “How Do You Talk to Your Clients About Gambling?”

Response Category	Number of Counsellors
Individual counselling sessions	4
Discuss finances	3
Clients avoid conversation	3

I think what would motivate them to ask for help is, as I said ... if when bills came due they didn't have the resources to pay them, especially when they're well and not spending any more money on drugs. (Counsellor 4)

Clients agreed with counsellors and stated that they would only recognize that their gambling has become a problem when they can no longer pay their bills.

When I don't pay my bills ... My bills and puts me on the street, then yeah, that's bad, or my lights get turned off ... (Client 2)

Table 3 shows the most common counsellor responses to the question, “What do you think motivates clients to ask for help with problem gambling?” Six counsellors reported that money is a motivator for change. Four counsellors reported that monetary issues would trigger a client's motivation for change. Two additional counsellors reported that a monetary incentive, such as a paid research study, would trigger change in clients.

In addition, several counsellors indicated that their conversations about gambling with clients revolve around financial planning (Table 4). Several counsellors mentioned that they use a money chart when discussing gambling with their clients in order to help them recognize that their gambling may be a problem.

People do the survey and they circle it, but not all of them are looking at the score sheet to see whether they made that level of problem or not ... I've always gone over the money and ... that seems to have a light bulb effect. (Counsellor 1)

Definition of Problem Gambling: Lifestyle Disruption Versus Overspending

Counsellors' definitions of problem gambling differed greatly from clients' definitions. The majority of counsellors stated that gambling becomes a problem

Table 5

Counsellor Responses to “How Do You Define Problem Gambling?”

Response Category	Number of Counsellors
Lifestyle disruption	7
Overspending	3
Loss of control	2

Table 6

Client Responses to “What Does the Term Problem Gambling Mean to You?”

Response Category	Number of Clients
Overspending	7
Frequency of gambling	2
Borrowing money	2
Loss of control	2

when it has a major effect on an individual’s lifestyle and interferes with his or her ability to perform daily activities in a normal manner (Table 5).

My definition of problem gambling is when it gets, it’s like an addiction, when it gets to the point where you’re not able to manage your day-to-day activities. Not so much debilitating as far as drug addiction, as far as you can’t get up in the morning, you’re always chasing, but as far as gambling, what I was explaining to my client is that you’re always trying to regain the loss. It’s the same. (Counsellor 8)

One counsellor defined it more specifically as a loss of control or a loss of focus on priorities.

I think every time I think of a problem, I think of loss of control. I think when it’s prevalent or there’s evidence of you losing control or not taking care of things that are a priority and you put things ... like gambling or drugs or whatever the case may be in front of that, I think that identifies in some way loss of control which constitutes a problem. (Counsellor 6)

In contrast, when clients were asked to define problem gambling, all but one client defined problem gambling as overspending, or not being able to pay bills (Table 6). Several examples of client’s definitions of problem gambling are as follows:

Problem gambling, it comes to a problem when it affects you paying your bills. You gamble on the odds. You can’t afford to do it but you do it anyway ... That’s when it becomes a problem. (Client 1)

Instead of getting my money order for my rent, first I go to the next window at the check cashing place where I get my money order and get scratch-offs and sit there and play them. (Client 2)

Problem gambling to me is when you had twenty thousand dollars and it be gone in a year. That's a problem. (Client 6)

While counsellors acknowledge that a lack of money or overspending might be signs of a gambling addiction, it is not the only indicator of gambling addiction. Given that the overwhelming majority of clients defined problem gambling solely as overspending, clients seemed to be able to acknowledge gambling as an issue only if it was having an impact on their financial situation. Clients tended to not recognize gambling as a problem if it was not causing financial struggle.

If they're spending all their money on gambling. If they're constantly buying scratch offs or they're constantly gambling on things like dog fights or anything really is a problem; but gambling is really bad for taking your money ... (Client 5)

Obstacles to Treatment: Issue Avoidance Versus Embarrassment

Counsellors stated various obstacles that interfere with clients seeking treatment for problem gambling, including lack of awareness, legality of gambling, lack of counsellor education, denial, and issue avoidance. Table 7 shows frequency counts of the most common counsellor responses to the question, "What are obstacles for clients receiving treatment for gambling?" Many counsellors thought that clients were unaware about the negative effects of problem gambling and suspected that to be the reason for clients not seeking treatment.

... A lot of us weren't raised knowing how to save and what different savings accounts are, retirement funds, and all that. I think education about finances would probably help to raise a little bit more awareness about gambling. (Counsellor 1)

I'd just say a lack of insight, first of all. Like I said, a lot of people don't identify it with a problem. (Counsellor 6)

One counsellor mentioned that their own education was also an obstacle to clients receiving help for their problem gambling. Counsellors are trained in substance use

Table 7

Counsellor Responses to "What Are Obstacles for Clients Receiving Treatment for Gambling?"

Response Category	Number of Counsellors
Denial/issue avoidance	7
Lack of awareness/knowledge	5
Socially acceptable	5
Counsellor uneducated on gambling treatment	3

treatment and stated they did not have the resources or education to help clients with their problem gambling.

Maybe we need to have a counsellor here who is really versed on the questions that we can answer. I've been trained as a substance abuse therapist. As we go through this, I'm still learning where to refer, who to contact. Sometimes when patients come in and look for that instant gratification kind of thing, and if you don't have it right there, they're interest in it is deteriorating. (Counsellor 2)

Several counsellors stated that clients do not feel the need to address their gambling habits as an issue because they are able to function and pay their bills with their current gambling habits. Clients may not be seeking treatment because they do not want to address gambling as a problem and may be avoiding the issue.

Then some people say, "Oh, well, I pay all my bills first so I don't have to worry about that." (Counsellor 1)

A lot of people actually budget their income to ensure or accommodate that ... A lot of them, it's hard for them to really grasp it as a problem. (Counsellor 6)

It hasn't really destroyed their life. They're functional. (Counsellor 5)

Another counsellor reported that some clients were not only avoiding the issue of gambling, but were also denying it completely as a problem.

Oh, no, they're not interested in any [resources] ... they denied it completely as a problem. (Counsellor 4)

In contrast, the majority of clients stated that guilt, shame, or embarrassment was the main obstacle keeping them from addressing their problem gambling habits (Table 8).

When you tell all the wrong things that you've done like, "Oh, I've took the rent money and my kids, or the light money," you know? ... Or "I took money that my kids didn't get a pair of shoes ..." To me that's the hardest thing of just saying what you've done ... the guilt. (Client 3)

For me, what makes it hard is when I talk about, I be embarrassed about when I start going downhill. Like, me having a problem and it got out of control,

Table 8
Client Responses to "What Makes It Hard to Talk About Gambling?"

Response Category	Number of Clients
Guilt/shame/embarrassment	7
Denial	2
Don't feel the need to talk about it	2

Table 9

Counsellor Responses to “What Are Some Treatments You Think Might Be Useful for Methadone Program Clients With Problem Gambling Behaviours?”

Response Category	Number of Counsellors
Individual therapy	4
Psychoeducation	4
Money management skills	4
Modify screening measure	4

like I’d have messed up my rent money. Money that I was supposed to spend on my children—on my family. (Client 4)

Treatment Setting: Individual Therapy Versus Group Therapy

Another disconnect between counsellors and clients emerged when discussing treatment options for problem gambling. Table 9 shows the most common counsellor responses to “What are some treatments you think might be useful for methadone program clients with problem gambling behaviours?” Half of the counsellors stated that they believed that clients would prefer to discuss their gambling habits during a one-on-one session, whereas clients stated that they would prefer to talk about their gambling problems in a group setting. Counsellors also suggested psychoeducation, money management skills, and a modified screening measure as other potential treatment methods.

Counsellors shared a similar rationale for their belief that individual therapy would be a better setting to address gambling than a group setting. Given that finances are a personal topic, many counsellors thought that clients would not want to discuss their gambling habits in a group.

I usually do it in an individual setting because it’s personal when you start talking about finances with people. (Counsellor 8)

However, a majority of clients stated that they would like to attend a group or gambling-specific program for clients with gambling addiction. Clients also reported that it would be easier to talk about gambling if they had good rapport with their counsellor (Table 10).

It’s when I have other people sharing where they’ve been where I’m at and I see that “Wow, if they can do it, I know that I can do it.” So, it would help me to easy open up to admitting and to sharing that I really have a problem because I’m not by myself, I’m not the only one that went through this. (Client 4)

Overall Theme: Relatability

Throughout each interview, investigators noticed a common theme of relatability among clients. Clients indirectly mentioned numerous times throughout the course of

Table 10

Client Responses to “What Would Make It Easiest to Talk About Gambling?”

Response Category	Number of Clients
Groups	4
Counsellor with good rapport	3
Gambling-specific program	2
Nothing	2

the interviews that relatability is a crucial aspect to acknowledging and receiving treatment for problem gambling. The majority of clients stated that having counsellors who have gone through a similar experience was important to them in terms of talking about and treating their problem gambling.

It’s a real big difference the counsellors that actually had an addiction problem and they on the other side now and they’d talking to us and letting us know that it’s a way you can come out of that, then to someone who got the knowledge by book-wise and never even had a drug addiction or a gambling addiction. (Client 4)

What makes it hard to talk about gambling is the person don’t gamble. (Client 6)

One client in particular expressed strong feelings about the importance of having a counsellor with a history of addiction. This client stated that they could not relate to a counsellor who does not have a history of addiction and thinks that all counsellors at the substance use clinic should have a history of addiction in order to be able to effectively help clients.

The ones that come in there and work from the books, not from the streets, I can’t comprehend with. I can’t get with. I don’t get along with them because they think they know everything about me and they don’t know nothing even to begin with. I can’t ever explain. (Client 2)

Clients also discussed the importance of their relationship with their counsellor. Several clients stated that if they did not have a good relationship with their counsellor, they would be much less open to discussing gambling habits. In contrast, they stated that they would be willing to discuss those habits with counsellors they trust.

...You’ve got to find somebody that you can talk to and that’s the only way you’re going to fight it. (Client 8)

As demonstrated in this quote, clients felt that sharing experiences and personal stories would help them open up about their own gambling habits. Most clients expressed interest in having groups specifically for those with problem gambling.

Just go and talk about your addiction. Somebody might be saying the way you feel. They might be going through the same thing you’re going through. (Client 8)

A majority of clients were confident that they would attend a gambling group at the clinic if one were available. A few clients mentioned that the group would work like a networking system and that clients would encourage other clients to attend the group.

Here's how it works. Say I've got a gambling problem, and you probably got a gambling problem, too. I'll come to you and say, "The clinic got a good gambling group. You should go check it out." You got to network. Even though he might think that he ain't got no gambling problem, you can still get him to go with you. (Client 1)

Discussion

Rates of problem gambling behaviours have been found to be elevated among individuals receiving treatment for SUDs. In MMTPs, as many as 52.7% of surveyed clients met the criteria for gambling disorder (Elman et al., 2016; Himelhoch et al., 2015; Feigelman et al., 1995; Leavens et al., 2014 ; Spunt et al., 1995, 1996; Weinstock, Blanco & Petry, 2006). These high rates of gambling in MMTPs demonstrate an unfulfilled need to address problem gambling behaviours in the substance use treatment setting (Leavens et al., 2014).

In the present study, interview content revealed that counsellors believed that problem gambling is widespread among clients receiving treatment in the clinic, and counsellors acknowledged that problem gambling can be detrimental to a client's recovery from SUDs. Surprisingly, clients also acknowledged the high prevalence of problem gambling behaviours in the clinic and recognized that problem gambling has similar symptoms to drug addiction and can lead to a relapse. These findings resonate with previous research that has found that gambling disorder is associated with negative effects on substance use treatment (Leavens et al., 2014; Ledgerwood & Downey, 2002). Although it is clear that both counsellors and clients are aware that gambling is a common problem at the clinic, the majority of counsellors did not report discussing or treating problem gambling behaviours. This finding is consistent with research suggesting low rates of gambling treatment in substance use treatment, despite a reported desire from participants for these services (Leavens et al., 2014). Given the high rates of problem gambling, it is imperative that treatment for problem gambling behaviours is offered in substance use clinics.

These interviews lend insight into the beliefs of counsellors and clients regarding their expectations and perspectives of gambling and gambling treatment in the clinic, shedding light on the differences between clients and counsellors. An examination of these inconsistencies will promote a better understanding of clients' perceptions of problem gambling and may be able to help counsellors treat clients in a more effective manner.

The first difference was the stated cause of high rates of gambling in clients being treated in the clinic. Counsellors stated that clients' lack of awareness and education

about problem gambling caused them to be uninformed about the negative effects of gambling. Several counsellors implied that clients were becoming problem gamblers without recognizing that their habits may be unhealthy or addictive. However, in speaking with the clients, it was clear that the majority of them recognize that gambling is an addictive behaviour. Clients explicitly stated on several occasions that gambling is an addiction and can be used as a substitute for drug addiction. A previous study supports this finding and reported that 30% of participants were concerned that their gambling would have an impact on their recovery from substances (Leavens et al., 2014). Given that clients at the clinic are aware of the signs of addiction and relate gambling addiction to drug addiction, lack of awareness may not be the cause of the high rates of gambling.

Although lack of awareness may not be driving high gambling rates, client education could influence gambling rates. Research has found that gamblers often have irrational beliefs about gambling (Delfabbro, 2004). In the present study, a second inconsistency was discovered when the definition of problem gambling was discussed with clients and counsellors. Clients define problem gambling only in terms of financial struggle; the majority of clients stated that gambling becomes a problem when individuals are no longer able to pay their bills. Counsellors, on the other hand, define gambling in terms of lifestyle disruption. In their responses, counsellors implied that gambling is a problem when it has a major effect on an individual's lifestyle and interferes with his or her ability to perform daily activities in a normal manner. Despite education on the odds of winning, many disordered gamblers continue to gamble and have strong beliefs that they will win. Disordered gamblers often win by persistence and frequent play, but allow those small wins to maintain their interest (Delfabbro, 2004). Persistent gambling is often not viewed as a problem to clients because they experience some success; however, this type of gambling can still become problematic. This discrepancy shows that clients focus on the more immediate problems of gambling and tend not to recognize other problems associated with their gambling behaviour. Clients may benefit from further education on the definition of problem gambling.

In addition to increased education, increased treatment options for problem gambling in the clinic may help address the issue. A third difference was revealed when discussing client and counsellor thoughts on the optimal treatment modality for problematic gambling. Counsellors believed that individual counselling sessions would be the best setting to discuss gambling behaviours and financial status because of the personal nature of the topic. Clients, however, stated they would prefer a group setting in which they could share stories and relate to others. The preference for a group setting rather than an individual setting was interesting considering that embarrassment was identified as a major obstacle to treatment. Although clients agree that they would not want to discuss their gambling or financial problems in public, they would be comfortable discussing them in a group if everyone in the group struggled with the same issues. Clients indicated a strong preference for personal stories, personal connections, and relatable counsellors. Clients also demonstrated a preference for counsellors who have histories of addiction.

This finding demonstrates that clients are seeking empathy in their relationships with counsellors.

Empathy is defined in the therapeutic relationship as experiencing an accurate understanding of the client's awareness of his or her own experience (Rogers, 1957). Empathy is a fundamental concept in the therapeutic relationship (Moyers & Miller, 2013; Norcross & Wampold, 2011) and many research studies have reported that empathy is associated with positive addiction treatment outcomes (Bein, Miller, & Tonigan, 1993; Fiorentine & Hillhouse, 1999; Meier, Barrowclough, & Donmall, 2005). The finding that clients of this MMTP request personal stories and counsellors with a history of addiction reveals that counsellors may not be demonstrating empathy towards their clients. This finding informs clinics that training in empathetic understanding is essential for counsellors to improve relationships with clients. Experiential learning techniques, such as improvisation, role play, and abstinence or behaviour change challenges, can be used to teach empathy to counsellors and students (Bayne & Jangha, 2016; Giordano, Stare, & Clarke, 2015; Warren, Hof, McGriff, & Morris, 2012; Yates, DeLeon, & Rapp, 2017).

The finding that clients prefer group treatment to individual treatment is also important when taking into consideration the cost-effectiveness of group treatment over individual treatment. Research has shown that group and individual therapy have similar outcomes, but that the group setting is a more cost-effective treatment format (Marques & Formigoni, 2001; Sobell, Sobell, & Agrawal, 2009). This suggests that a group specifically for those with problem gambling behaviours might be a cost-effective and efficient way to offer problem gambling treatment within the MMTP.

Clients and counsellors agreed that there are numerous barriers surrounding problem gambling treatment in the clinic. Each group, however, had distinct views on which of these obstacles was the main hindrance. Counsellors reported many obstacles to treatment, as discussed earlier, including lack of awareness, legality of gambling, lack of counsellor education, client denial, and issue avoidance. Many counsellors reported that they felt that issue avoidance was the main obstacle to treatment and that clients did not seek treatment because they were ignoring signs of problem gambling or in denial about having problem gambling behaviours. Clients, however, reported far fewer obstacles than counsellors did and stated that their main obstacle to treatment was guilt, shame, and embarrassment. This suggests that lack of awareness, denial, and issue avoidance may not be the client's main obstacles for seeking treatment for gambling addiction; instead, embarrassment may be a leading obstacle. This finding reinforces previous research that psychological barriers such as pride, shame, and stigma are the leading barriers to treatment (Pulford et al., 2009; Suurvali, Cordingley, Hodgins, & Cunningham, 2009; Suurvali et al., 2012). Minimization or issue avoidance were also reported as major obstacles to treatment in previous studies. Lack of awareness or knowledge and logical issues were mentioned to a lesser degree (Pulford et al., 2009; Suurvali, Cordingley, Hodgins, & Cunningham, 2009). A change in protocol for discussing

problem gambling behaviours in the clinic may be necessary to better address this issue.

Current clinic protocol includes a brief screening for problem gambling during intake, but does not outline any follow-up procedures for discussing the results of the problem gambling screen. A majority of counsellors reported that they discuss gambling habits after intake only if their clients bring them up. There were a variety of reasons for this, including (a) that the counsellors thought drug addiction took priority over gambling, (b) that the counsellors were unaware of the client's score on the gambling questionnaire completed during intake, and (c) that the clients denied having a gambling problem. These responses suggest that it may be beneficial for clinics to develop a protocol for discussing gambling habits with clients who were identified as problem gamblers during intake.

Along with client education, several counsellors suggested that counsellor education could be an obstacle to treatment. Several participants mentioned casual and social discussions of gambling with their counsellors, for example, talking about the games or numbers they intended to play. One participant accused the counsellor of having a gambling addiction. This is consistent with research showing that substance abuse counsellors struggle with problem gambling at much higher rates than the general population does (Knopt, 2005; Weinstock, Armentano, & Petry, 2006). MMTP counsellors are trained to address SUDs; therefore, many stated that they do not feel they have the knowledge to treat problem gambling. Several counsellors stated that they would be interested in receiving more education on gambling. Others suggested that hiring a counsellor specifically for problem gambling at the clinic might be a more effective way to address the issue. If education on problem gambling were increased among the counsellors, more MMTP clients might be able to receive education and services. Further investigation should focus on the most effective ways to train traditional addiction counsellors to ensure they are prepared to discuss problem gambling with clients.

Limitations

Although we achieved our research aims in this study, several limitations should be noted. First, because of the exploratory and qualitative nature of this study, the sample size was small. This was also a convenience sample and may not be generalizable to other urban substance use treatment clinics. Future research should conduct a multi-site study to explore a larger and more diverse sample. This is one of the first qualitative investigations to explore the perceptions of problem gambling in a substance use treatment setting and provides a promising starting point for further investigation.

Conclusion

Although increased prevalence of problematic gambling in MMTPs has been reported for well over a decade, there continues to be a lack of screening and

treatment services provided in these clinics. In our study, both clients and counsellors recognized the high prevalence of problem gambling among clients treated in the clinic, but also acknowledged that efforts are not being made to address the issue. We identified that clients are aware of the financial consequences of their gambling habits, but established that further education needs to be provided about the effects of gambling on recovery from drugs. Clients demonstrated a strong preference for treatment options that did not make them feel singled out; they preferred group over individual therapy, requested personal stories in the literature about problem gambling, and heavily preferred counsellors with a history of addiction. This highlights the need to make clients feel comfortable and understood when they are receiving treatment. Counsellors demonstrated a need for further training about techniques for treating problem gambling and appeared to be open to receiving education. Finally, standardization of clinic procedures for addressing problematic gambling might help clinicians to more effectively recognize and treat problem gamblers. The hope is that the results of these qualitative interviews may help programs address some of the barriers that appear to continue to hamper efforts to provide services that address problematic gambling in MMTPs. A combination of both counsellor and client education and clinic policy change may help launch more treatment of problem gambling in substance use treatment settings.

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Appendix A

Interview Discussion Guide: Methadone Program Clients

1. I would like to take a few minutes to introduce ourselves.
2. Can you list types of gambling you can think of?
3. What types of gambling do you do?
4. How has [the lottery/scratch offs/etc.] affected your life?
5. How much do you think is okay to spend on [the lottery/scratch offs/etc.]?
6. What does the term “problem gambling” mean to you?
7. What kinds of conversations have you had in the clinic about gambling?
8. How do people talk about gambling in the clinic?
9. How do you think your counsellor views [the lottery/scratch offs/etc.]?
10. How could gambling affect someone’s recovery from drugs/alcohol?
11. How should gambling be talked about as it relates to your treatment?
12. What makes it hard to talk about gambling?
13. What would make it easiest to talk about gambling?
14. What kind of information do you think could be used to help people become aware of how gambling can affect their recovery?
15. If you or someone you knew wanted to get help for gambling problems, who would you call?
16. If we were to make a brochure to make people more aware of gambling problems, what would you put in it?
17. Is there a type of advertising that you think would be more helpful?

Appendix B

Counsellor Interview Guide: Methadone Program Counsellors

1. I’d like to start off by listing different ways that people gamble. Can you list types of gambling you can think of?
2. Is there a type of gambling that you’ve heard your clients discussing more frequently than others?
3. So now I’d like to hear your definition of problem gambling. How would you know if one of your clients had a problem with gambling behaviours?
4. What is your opinion about whether screening for problem gambling behaviours should be addressed in treatment?
5. Have you spoken with any of your clients about problem gambling behaviours?
6. Do you think that gambling can have an impact on your client’s recovery?
7. Tell me about your experiences in the clinic. Have any of your clients ever asked you about gambling?
8. What do you think motivates them to ask for help with problem gambling?
9. What are some obstacles that might interfere with a client seeking treatment for problem gambling behaviours?
10. What are some treatments you think might be useful for methadone program clients with problem gambling behaviours?

11. Can you list some places to go to get help for problem gambling in the city of Baltimore?
12. What would be the best way to make sure that clients in methadone treatment who want help with problem gambling behaviours actually get it and use it?
13. Do you have any other comments on problem gambling in the methadone clinic?

Combining Cultural and Individual Dimensions in the Analysis of Hazardous Behaviours: An Explorative Study on the Interplay Between Cultural Models, Impulsivity, and Depression in Hazardous Drinking and Gambling

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Abstract

We aimed in this study to analyse how impulsivity and depression are related to hazardous gambling and drinking, while taking into account the moderating effects of the cultural models that people use to interpret their social environment. Cultural models, impulsivity, depression, hazardous gambling, and drinking were assessed in a convenience sample of 329 subjects recruited in three contexts (university, health services and support settings, venues for gambling and drinking) in South-eastern Italy. Mixed models were used to explore the influence of the different variables separately and the interaction between cultural models and the other predictive variables (impulsivity and depression). The findings show that different cultural models of the social environment are related to different probabilities of hazardous drinking and gambling. Heavy drinkers and gamblers tend to perceive their social world as an extremely anomic environment. In the case of hazardous drinking, this critical view of the social environment is associated with lack of premeditation, lack of perseverance, sensation seeking, and depression. In the case of gambling, this view is associated with sensation seeking and depression. Moreover, the way in which the participants evaluated the social environment was found to moderate the influence of depression in hazardous drinking and of sensation seeking in hazardous gambling. The findings of this exploratory study offer support to the idea that exploring cultural factors and how they combine with other psychological and psychosocial risk factors may promote a better understanding of people's engagement in hazardous behaviours.

Keywords: hazardous gambling, hazardous drinking, cultural models, impulsivity, depression, multilevel regression model

Résumé

Dans cette étude, notre objectif était d'analyser le lien entre impulsivité et dépression, d'une part, et les risques de jeu et la consommation d'alcool, d'autre part, tout en

tenant compte des effets modérateurs des modèles culturels que les gens utilisent pour interpréter leur environnement social. Les modèles culturels, l'impulsivité, la dépression, le jeu à risque et la consommation d'alcool ont été évalués sur un échantillon de commodité de 339 sujets recrutés dans trois contextes différents (université, services de santé et structures de soutien, lieux de jeu et de consommation d'alcool), dans le sud de l'Italie. Pour explorer séparément l'influence des différentes variables et l'interaction entre les modèles culturels et les autres variables prédictives (impulsivité et dépression), on a utilisé des modèles mixtes. Les résultats montrent que différents modèles culturels d'environnement social sont liés à différentes probabilités de consommation dangereuse d'alcool et de jeu problématique. Les gros buveurs et les joueurs excessifs ont tendance à percevoir leur monde social comme un environnement extrêmement anémique. Dans le cas de la consommation abusive d'alcool, cette vision critique de l'environnement social est associée à un manque de préméditation, à un manque de persévérance, à la recherche de sensations et à la dépression. Dans le cas de problème de jeu, ce point de vue est associé à la recherche de sensations et à la dépression. De plus, on a démontré que la manière dont les participants évaluaient l'environnement social diminuait l'influence de la dépression liée à une consommation d'alcool abusive et de la recherche de sensations fortes dans le jeu problématique. Les résultats de cette étude exploratoire sous-tendent l'idée voulant que l'exploration de facteurs culturels et la manière dont ils se combinent à d'autres facteurs de risque psychologiques et psychosociaux permettent de mieux comprendre la propension des personnes à adopter des comportements à risque.

Introduction

In the mainstream approach to hazardous drinking and gambling, these conditions are depicted as being characterized by an unhealthy and uncontrollable urge to use a substance or to engage in a certain activity that has maladaptive and disastrous results for both mental and physical health and in the areas of work and relationships (American Psychiatric Association [APA], 2013; Robinson & Berridge, 2001). The current edition of the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; APA, 2013) classifies problem gambling in the same category as substance use: "addiction and related disorders." The rationale for this choice is that the growing scientific literature reveals common elements between gambling and substance use disorders, ranging from the external consequences of financial problems and destruction of relationships to the biological and psychological process identified as the foundation of addictive behaviours (Pace, Schimmenti, Zappulla, & Di Maggio, 2013; Reilly & Smith, 2013).

The main assumption on which scientists' and health professionals' perspectives on addiction are based is that the predictable way of behaving and acting is due to a specific configuration of an encapsulated mind: The problem lies in the brain and

mind. The trait-based approaches stress that certain individuals possess undeniable qualities (e.g., neurobiological alterations, high levels of impulsivity, short-sightedness towards delayed outcome of choice, deficit in mood regulation) that make them more likely to engage in hazardous behaviour. It is worth observing that the way in which a problem is defined, even implicitly, has flow-on effects on how policies are envisaged (Bacchi, 2009). After problem gambling (or problem drinking or drug use) is interpreted as a matter of individual health more than a political, cultural, or social concern, neither the government nor the social network (family, peers, neighbourhood) is responsible for restricting its consumption (Reith, 2007), or for reflecting on the ways they fuel or constrain individual attitudes towards gambling or drinking: The individual becomes the privileged target of the intervention (Venuleo & Marinaci, 2017).

On the other hand, cross-cultural, ethnographic, and anthropological studies underline that gambling, like hazardous alcohol use, takes on different meanings in different cultural contexts and serves different functions regarding the relationship between the individual and his or her community (cf. Binde, 2005; Room & Mäkelä, 2000). Longitudinal studies, grounded on theories of social learning and cultural capital, reveal the importance of daily interactions with family members, friends, and other referents in constructing the meaning of gambling (McComb & Sabiston, 2010) or drinking (M. D. Wood, Read, Mitchell, & Brand, 2004) and in the ways that individuals move in and out of problem behaviour over time (gambling: Reith & Dobbie, 2011; drinking: Chassin et al., 2002).

According to the cultural standpoint (Raylu & Oei, 2004; Room & Mäkelä, 2000; Valsiner, 2000), the engagement of people in hazardous behaviours cannot be understood independently of their cultures and intersubjective life worlds. The very concept of risk is inherently subjective (Krimsky & Golding, 1992; Slovic, 1999), meaning different things to different individuals and cultural groups. Abt, McGurrin, and Smith (1985) observe that contexts “provide the participants ready-made cultural texts or rationales for their own constructions of reality” (p. 79). Accordingly, any model of hazardous behaviours must focus on people’s interpretations and evaluations of the meaning of activities within a social and cultural context. “If we wish to explore Chinese attitudes towards chance and money, we must also discuss their attitudes towards destiny, luck and work” (Papineau, 2005, p. 165).

Cole (1996) points out the need to consider cultural variability in psychological processes to know whether such processes are universal or specific to particular cultural circumstances. Culture may play a leading role in moderating the effect of different protective or risk factors (Venuleo & Marinaci, 2017). For instance, it is recognized that the risk factors of pathological gambling are different in different communities (Papineau, 2005) and ethnic groups (Kim, Kim, & Nochajski, 2012). Similar evidence was found regarding hazardous drinking (Rissel, McLellan, & Bauman, 2000), as well as other types of disorders (i.e., post-traumatic disorder: Bhugra & Mastrogianni, 2004; schizophrenia: Jenkins, 2007; mood disorder: Perilla, Norris, & Lavizzo, 2002). However, several studies based the analysis of cultural

differences and their impact on hazardous behaviours in terms of differences between societies (Pöysti & Majamäki, 2013) that have different characteristics regarding ethnicity, race, nationality, and specific attitude (i.e., collectivist vs. individualistic cultures), with little recognition of the cultural variability among people belonging to the same society (Calogiuri & Venuleo, 2017; Cohen, 2009; Room & Mäkelä; 2000; Valsiner, 2003).

The Present Study

In this study, we investigated the role of inter-individual cultural differences in the way in which people interpret their social experience. More specifically, we suggest that people's cultural models, understood as systems of meanings, may either encourage or discourage hazardous behaviours, both by establishing what people recognize as "hazardous" and what hazardous behaviours might mean in their lives and by moderating the role of other factors that might refer to individual functioning or impairment (i.e., personality traits, affects, mood regulation). We refer to these meanings in terms of cultural models to stress the assumption that they are intrinsically intersubjective and social. The macro-social dimensions and intersubjective life worlds of people provide the semiotic resources that ground the way that they perceive and experience the social world (Zittoun, 2006), thus placing constraints on the virtually infinite number of ways in which people can interpret their experience.

On the basis of a semiotic and cultural research tradition, we use the notion of cultural models to refer to specific systems of generalized meanings that organize the perspective through which people look at their context and thus the way to act, think, and feel (Cohen, 2009; Corin, 1995; Salvatore & Venuleo, 2013; Valsiner, 2007). The notion of a cultural model may recall that of subculture (Abt et al., 1985), traditionally understood as a set of ways of understanding, behaviours, and artefacts used by particular groups. Nonetheless, we prefer the former term because subcultures have often been equated with a set of persons who were identified through demographic features (such as youth), or a collective that was identified through a specific system of activity (such as a gang; Fine & Kleinman, 1979). In contrast, a cultural model (as intended here) consists of individual positioning within the socially shared symbolic universe, which may favour different systems of activity and groupings of people who are very different from a socio-demographic point of view (Venuleo, Salvatore, & Mossi, 2015). Individual positioning derives both from people's own biographies and from the collective or shared sociocultural forms of thinking, communicating, and acting (what we refer to in terms of culture) that form the traditions of society (Dressler, 2004). Incidentally, this means that the role of culture can be studied in terms of differences between individuals within a society and is not limited to differences between societies.

It is worth emphasizing that we call the meanings making up cultural models "generalized" because they do not concern single elements (events, rules, tasks, goals, family, friends, services, and so on) of the life experience, but serve as the

“lens” through which people interpret the experience as a whole. In other words, generalized meanings orient the way people are predisposed to act and react in the world through different circumstances and relationships (Salvatore & Venuleo, 2008; Venuleo, Salvatore, & Mossi, 2015). Here, we are thinking of expressions such as “Life is a matter of duties and responsibilities” or “It’s better to burn out than to fade away” or “You cannot trust anyone.” Previous studies, based on the view of cultural models proposed above, highlighted the role of cultural models that people use to interpret their social environment when differentiating social gamblers from pathological gamblers (Venuleo, Salvatore, & Mossi, 2015), as well as alcoholics from a control group (Venuleo, Calogiuri, & Rollo, 2015). In all cases, the problem group was characterized by a negative view of both the micro and macro social environment, perceived as anomic, unreliable, and destined not to change at all. In this study, we intended to examine this matter in greater depth by pursuing two main goals.

Our first goal was to analyse the influence of cultural models on two different hazardous behaviours related to drinking and gambling. Our general hypothesis was that the way people relate to hazardous behaviours conveys points of view not only on the target behaviours, but, more broadly, on people’s social experience. More specifically, we expected that cultural models associated with a critical image of the social environment, devaluing social ties and the rules of coexistence, were more likely to be associated with hazardous drinking and hazardous gambling (Venuleo, Rollo, Marinaci, & Calogiuri, 2016). This suggestion is consistent with the notion of “cultural consensus” proposed by Dressler and colleagues (2007) to emphasize that the degree to which individuals, in their own beliefs and behaviours, approximate widely shared cultural models (e.g., their “cultural consensus”) is associated with the levels of their psychological and psychosocial distress and health outcome. The higher prevalence of involvement in high-risk behaviours among minorities exposed to the effects of acculturation-related stress (Factor, Kawachi, & Williams, 2011; Martinez, 2006), as well as the results from studies exploring the relationship between moral disengagement and gambling and alcohol use (Barnes, Welte, Hoffman, & Dintcheff, 1999; Newton, Havard, & Teesson, 2012), offers indirect support to the idea that a critical view of one’s social environment can constitute a sociocultural terrain for engagement in hazardous behaviours (Cox, Burr, Blow, & Parra Cardona, 2011). The hypothesis is also consistent with what is suggested by qualitative research: Evidence suggests that such behaviours and health-related lifestyles emerge in relation to social malaise, often related to feelings of meaninglessness, lack of a sense of belonging, and feelings of alienation (powerlessness and hopelessness; Borrell & Boulet, 2005; Paluoso, 2000).

The second aim of the study was to explore the role of cultural models in moderating the impact of individual factors associated with hazardous gambling and alcohol use. We selected two different risk factors, impulsivity and depression, whose association with both hazardous gambling and hazardous drinking has been established by various studies.

Impulsivity. This is the most frequently cited risk factor for maladaptive behaviours (Anestis, Selby, & Joiner, 2007) and various authors agree that impulsiveness,

or some specific facets of it, make individuals more prone to approach a behaviour without considering the consequences, such as heavy drinking (Carlson, Johnson, & Jacobs 2010), pathological gambling (Nower, Derevensky, & Gupta, 2004; Verdejo-García, Lawrence, & Clark, 2008), and other forms of behavioural dependence (Lejoyeux, Mc Loughlin, & Ades, 2000). “After all, an inability to inhibit consumption despite an effort to do so in the face of negative consequences is a textbook definition of impulsive behavior and a key component of alcohol dependence” (Whiteside, & Lynam, 2003, p. 70), as well as of gambling dependence (Rosenthal, 1992).

However, one has to recognize that impulsivity may be expressed through very different behaviours in everyday life (i.e., talking on the phone while crossing the road, risky driving, unsafe sex), corresponding to different levels of harm and social adaptation (Gullo & Dawe, 2008; Schulenberg & Maggs, 2002). Contextual factors may influence the interaction between impulsivity and outcome behaviour (Zimmerman, 2010). This argument is supported by the evidence that, although impulsivity as a trait is universally recognizable, the prevalence of hazardous and harmful drinking and other impulsive behaviours differs in different historical periods (Sweeting & West, 2003) and in different societies (Rehm et al., 2003). It is reasonable to assume that people who are high on impulsivity are, remain, or become hazardous drinkers (rather than hazardous gamblers, drivers, and so on) when their impulsivity interacts with a social and cultural environment that allows their drinking to begin and to be maintained (Venuleo, Calogiuri, & Rollo, 2015). From a cultural standpoint, what differentiates socially acceptable impulsive behaviours from the unacceptable forms varies from one culture to another, from one era to another (Evenden, 1999), and variation in the meaning of impulsive behaviours may play a role in the different rates. For instance, a body of research highlights how a variety of risky behaviours have higher rates in nations with more individualistic cultural orientations and have lower rates in collectivistic cultures, emphasizing values such as conformity, obedience, and in-group harmony (Schwartz et al., 2011).

Depression. One issue that has been examined in detail is the association between alcohol use disorders and major depression (Conner, Pinquart, & Gamble, 2009; Jane-Llopis & Matytsina, 2006), which is robust to variations in both study design and measurement method (Boden & Fergusson, 2011). Depression has also been found to be a risk factor for problem gambling (Griffiths & Wood, 2000; Gupta & Derevensky, 1998; Lynch, Maciejewski, & Potenza, 2004; Raylu & Oei, 2004). Several scholars have suggested that people often make use of alcohol or gambling to regulate unpleasant emotions (drinking: Gonzalez, Reynolds, & Skewes, 2011; Holahan, Moos, Holohan, Cronkite, & Randall, 2001; gambling: Gupta, Derevensky, & Marget, 2004; R. T. Wood & Griffiths, 2007) as a means of palliative escape and to relieve symptoms of psychological distress, including anxiety and depression. Other scholars have suggested that depressive symptoms are likely to be an effect of alcoholism (Schuckit, Irwin, & Smith, 1994; Swendsen et al., 1998) and gambling (Rosenthal & Lesieur, 1992), or to have a bidirectional relationship with them; for example, financial losses resulting from gambling may exacerbate depressed affect and

maintain the need to continue gambling (Blaszczynski, Winter, & McConaghy, 1986). Few studies have explored the role that social-cultural context plays in the association between depression and hazardous behaviours. Yet also in this case, it must be recognized that psychological distress and ways of coping with it may be influenced by social and cultural factors such as social isolation, lack of social support, racism, unemployment and poverty, poor housing, and lack of access to appropriate medical care (Bhugra & Becker, 2005), as well as by the cultural meanings through which people interpret their social condition and what happens in their life. For instance, take two people viewing the social environment through two different lenses, Subject A, seeing the social environment as an unwelcoming place, lacking opportunities for development, governed by dishonest politicians, and inhabited by people who think only of themselves, and Subject B, expressing faith in people's willingness to help each other in times of trouble and trust in the institutions' attempt to encourage people to develop and to improve the country. It is reasonable that these different attitudes influence the association between depression and hazardous behaviours in two ways: They may have an impact on the ways in which people interpret and cope with difficulties that are related to depression and the need to escape by drinking or gambling, and they may influence the ways in which people interpret and cope with difficulties that are related to drinking and gambling, with a resulting increase or decrease in psychological distress.

Hypothesis and Exploratory Research Questions

On the basis of the previous literature, we hypothesized the following:

1. There is a positive association between impulsivity and both hazardous drinking and hazardous gambling (Hypothesis a).
2. There is a positive association between depression and both hazardous drinking and hazardous gambling (Hypothesis b).

Regarding the role of cultural models, we identified the following exploratory research questions:

1. Different cultural models are associated with both hazardous drinking and hazardous gambling to different degrees.
2. Cultural models interact with impulsivity in affecting the likelihood of hazardous drinking and hazardous gambling.
3. Cultural models interact with depression in affecting the likelihood of hazardous drinking and hazardous gambling.

Method

Participants

The study was conducted in a middle-sized town in south-eastern Italy, based on a convenience sample of 329 participants (mean age: 34.73 years $\pm$ 13.158).

To facilitate recruitment among people with different levels of gambling involvement and alcohol use—non-gamblers, gamblers, and problem gamblers—we recruited participants in three different contexts: undergraduate university courses ($n = 74$), venues for drinking or gambling ($n = 135$; cafés, betting centres, tobacco shops), and health services and support settings ($n = 120$; Alcoholics Anonymous groups, public health services for the treatment of addiction, rehabilitation communities, professional studios, Caritas).

Socio-demographic characteristics of the sample (age, marital status, job status, and educational level), disaggregated for the three contexts, are reported in Table 1. For chi-square computation, some categories were aggregated: separated/divorced and widower for marital status, unemployed/occasional workers and retired for job status. As might be expected, the three subsamples showed significant differences on all characteristics.

Preliminary Methodological Considerations: Assessing Cultural Models

From a cultural and semiotic perspective (Guidi & Salvatore, 2013; Mossi & Salvatore, 2011; Salvatore & Zittoun, 2011), we consider culture as a hierarchical, integrated system of meanings. Indeed, any culture is made up of a particular interweaving of generalized meanings encompassing the whole experience. Generalized meanings can be conceived as a polarity of an oppositional dimension, which we call a dimension of sense: for example, pleasant versus unpleasant, trustworthy versus untrustworthy, familiar versus unfamiliar (Mossi & Salvatore, 2011; Venuleo, 2013). This way of representing generalized meaning is grounded in the recognition of the basic bivalence of meaning (Salvatore, 2013), namely, the fact that meaning is a dichotomic structure: Any affirmation of a quality is at the same time the negation of the opposite quality. Accordingly, culture can be interpreted (and represented) in terms of basic dimensions of sense, and the individual's cultural model can be interpreted as a particular plotting of basic positions on those dimensions of sense (for instance, a combination of the positioning of “trustworthiness” on the “trustworthiness–untrustworthiness” dimension of sense and the positioning of “dependence” on the “dependence–autonomy” dimension of sense). This mode of representing the relationship between culture and cultural models is grounded in an epistemology that recognizes the dynamic interdependence between shared sociocultural forms of thinking and the ways that such forms are expressed by different individuals and groups. Such epistemology can also be recognized within social representations theory. Markova (2000) suggests the concept of *themata* to indicate culturally shared oppositional antinomies underlying popular thinking and grounding social representations of daily life phenomena.

It is worth highlighting that in the current study, we explored the components of cultural models associated with the domain of experience of the micro and macro social environment. The dimensions of sense for this component of the cultural models were investigated through a questionnaire designed to detect the generalized meanings concerning that domain of experience: Interpretation of the Social

Table 1
Socio-Demographic Characteristics of the Sample

Variable	Context modalities	University (<i>n</i> = 74)	Sites for drinking and gambling (<i>n</i> = 135)	Health services and support setting (<i>n</i> = 120)	Total (<i>N</i> = 329)	Significance	
						<i>F</i>	<i>p</i>
Age, <i>M</i> (<i>SD</i>)		22.45 (5.375)	35.97 (12.026)	41.03 (12.684)	34.72 (13.153)	63.61	2/317 <.0001
Gender	Male	8	74	82	164	63.05	2 <.0001
	Female	66	60	38	164		
Marital status	Single	67	72	54	193	44.7	4 ^a <.0001
	Married/Cohabitant	7	54	53	114		
	Separated/Divorced	0	5	11	16		
	Widower	0	1	2	3		
Job status	Student	65	20	7	92	206.8	6 ^b <.0001
	Employee	1	56	29	86		
	Freelancer	1	28	23	52		
	Unemployed/Occasional worker	3	28	50	81		
	Retired	0	2	9	11	64.34	4 <.0001
Educational level	No diploma	0	37	58	95		
	High school diploma	59	65	32	156		
	Post-secondary education/ College/University	15	31	29	75		

Note. Expected frequencies are higher than 20%; no frequencies are less than 1.

^aThe conditions separated/divorced and widower were aggregated for computing chi-square.

^bThe conditions unemployed/occasional worker and retired were aggregated for computing chi-square.

Environment (ISE). The ISE is based on a specific methodology of cultural analysis of psychosocial contexts (markers of organizational development methodology; cf. Carli & Salvatore, 2001; Mannarini, Ciavolino, Nitti, & Salvatore, 2012; Mossi & Salvatore, 2011) and is designed to map the cultural context of a given population and identify cultural models in which the cultural context is expressed. Two features give the questionnaire the power to encourage generalized evaluations, rather than, for instance, prompting circumstantiated reasoning or knowledge (cf. Mossi & Salvatore, 2011). First, the items concern generic objects (e.g., “Italian people,” “Italy”) in accordance with the idea that when the object is proposed in terms of a general class, it is more likely to work as a projective stimulus. Second, these items are associated with a 6-point Likert scale (e.g., “very unreliable,” “quite unreliable,” “a bit unreliable,” “a bit reliable,” “quite reliable,” “very reliable”); therefore, without intermediate alternatives, they were purposely chosen as a way to “force” the answers towards opposite modalities of response.

Instruments

A set of questionnaires was administered to every participant of this study.

Questionnaire on the Interpretation of the Social Environment (ISE; Mossi & Salvatore, 2011). The ISE was used to detect cultural models of the social environment. The items promote the expression of perceptions/opinions/judgements about the micro and macro social context (e.g., evaluations of trustworthiness of one’s residence, reliability of social structures) and of social identity (e.g., moral evaluations of social behaviour). The modalities of response are constructed to serve as bait to capture the general attitude towards the evaluation of the experience. Previous studies (Carli & Salvatore, 2001; Mannarini, et al., 2012) showed good construct validity.

Short form of the UPPS-P Impulsive Behavior Scale (S-UPPS-P; Billieux et al., 2012). This is a 20-item questionnaire based on the UPPS-P model (Whiteside & Lynam, 2001). According to this model, five distinct components of impulsivity are assessed (Cyders & Smith, 2007): sensation seeking, lack of premeditation, lack of perseverance, negative urgency, and positive urgency. Each facet is evaluated by four items on a 4-point Likert scale. The S-UPPS, initially developed in French (Billieux et al., 2012) and then adapted to English (Cyders, Littlefield, Coffey, & Karyadi, 2014), Spanish (Cándido, Orduña, Perales, Verdejo-Garcia, & Billieux, 2012), and Italian (D’Orta et al., 2015), validated the five-factor structure hypothesized to underlie the UPPS Impulsive Behavior Scale. The only study on the Italian short version of the UPPS-P (D’Orta et al., 2015) was conducted on 188 volunteers recruited through e-mail invitations and advertisements posted in Italian Facebook groups and Italian health-related forums.

Short Beck Depression Inventory (S-BDI; Beck, Rial, & Rickels, 1974). This is a 13-item form of the original BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) that assesses the severity of depression. The usefulness of the BDI has been repeatedly

demonstrated, as evidenced by its widespread clinical use, as well as for its use in outcome studies of psychotherapy and antidepressant treatment. Previous studies have used the S-BDI to assess depression among hazardous gamblers (Bonnaire, Bungener, & Varescon, 2009) and drinkers (Huurre, Aro, & Rahkonen, 2003; Korneich et al., 2011) and to support the use of the short form as a reliable and valid brief screening measure of depression and for research purposes (Reynolds & Gould, 1981). However, no Italian validation of the instrument exists.

Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). This is one of the most accurate screening tests used for the early identification of hazardous and harmful alcohol use. It consists of 10 items: three regarding quantity and frequency of alcohol use, three about alcohol dependence, and four about problems derived from its use during the past year. A variety of studies in many settings and nations support AUDIT's reliability and validity (Babor et al., 2001) and an Italian version has been used in different studies (Agabio, Marras, Gessa, & Carpinello, 2007; Strunin et al., 2010), but no Italian validation of the instrument exists.

Problem Gambling Severity Index (PGSI; Ferris & Wynne, 2001). The PGSI is considered a continuous (rather than dichotomous) scale of problem gambling severity and was designed specifically for use with the general population. The instrument is part of a larger battery, the Canadian Problem Gambling Index, originally developed by Ferris and Wynne (2001) and consists of nine items on scales ranging from 0 (*never*) to 3 (*almost always*). It asks respondents, within a 12-month time frame, to rate how frequently they engaged in various problem gambling behaviours. The PGSI demonstrated good internal consistency ($\alpha = .84$) and good criterion-related validity because it matches fairly well with the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) and the South Oaks Gambling Screen, correlating at .83 with both measures (Ferris & Wynne, 2001). A study by Barbaranelli, Vecchione, Fida, and Podio-Guidugli (2013) on a sample of gamblers confirms the internal validity, reliability, and concurrent validity of the Italian version of the PGSI.

Procedure

In all contexts, the questionnaires were administered individually. In accordance with the ethical code of the Italian Psychology Association (<http://www.aipass.org/node/11560>) and the Italian Code on the protection of personal data (Legislative decree No 196/2003), the participants were informed about the general aim of the research, the voluntary nature of participation, and the anonymity of responses. In the case of rehabilitation communities and of the Alcoholics Anonymous self-help group, this presentation was made by the research group at the opening of a weekly meeting. After that, consent for an information session was obtained through the contact person in each group. In the case of the public health services for the treatment of addiction SerD, the users gave consent to the therapist before being contacted for the interview.

In all support settings (SerD, Alcoholics Anonymous, rehabilitation communities) the questionnaires were administered in a room made available by the service. In the case of students, participation was requested collectively, before the lecture started; an appointment was booked for each student and the instruments were administered in an office in the researchers' department. The same office was used for the administration of questionnaires to subjects recruited in cafés and in non-specific contexts, such as streets, parks, and squares, after their agreement was obtained. No incentive was given.

Data Analysis

Data analysis was carried out in different steps.

Confirmatory factor analysis (CFA). Given the limits highlighted above (see the Instruments subsection), CFAs were run on all the instruments, with the aim of testing whether their original factor structure fit the hypothesized measurement model in our sample. The factor scores detected through confirmatory analysis were used for the subsequent analysis.

Detection of cultural models. Consistent with the suggestion that culture, as a complex phenomenon (Batista-Foguet, Mendoza, Pérez-Perdigón, & Rius, 2000), requires the recognition of the interdependency of all the survey variables, the responses of the general sample ($N = 329$) to ISE were put through multiple correspondence analysis (MCA; Lebart, Morineau, & Warwick, 1984). MCA is a non-parametric analysis technique that allows one to sum up the relations observed among nominal or ordinal data by using a limited number of factorial dimensions (Blasius & Greenacre, 1998). Each factorial dimension describes the opposition between two patterns of co-occurring response modalities across respondents. It is worth pointing out that the modalities co-occurring on a factorial polarity concern aspects that have no functional or semantic relationship; therefore, their aggregation can be interpreted as the effect of a latent generalized meaning linking the response modalities independently from their specific content (i.e., relationship with family, friends, service, norms; Mossi & Salvatore, 2011). We focused on the first three factorial dimensions (henceforth: ISE1, ISE2, ISE3) extracted by MCA, as they explained the largest proportion of the data matrix inertia. We adopted the subjects' scores (factor coordinates), which allow the position of each respondent on the three factorial dimensions to be identified and which were used as measurements of their cultural models. The greater the similarity between the respondent's response profile and the profile characterizing the factorial dimension, the higher the respondent's score on that factor or dimension of sense.

Influence of cultural models and other predictive variables on addictions. Multilevel regression models (mixed models) were applied to detect the influence on addictions of cultural models, impulsivity, and depression separately and in interaction with each other. We chose this model because it allowed two levels of analysis to be considered: (a) the participant's answers to questionnaires and (b) the context in which the participant was recruited. The source of variability related to

the context was treated as a co-variate to remove it from general error. In conducting the multilevel regression analyses, we used a model-building technique. Specifically, we first fit a model in which only cultural models—detected through ISE factor coordinates—were included (simple model), and then if one or more components of the cultural models were significant, all other variables were included (Model 1). This allowed us to observe any change in the parameter estimates and corresponding standard errors when interactions between cultural models and the other variables, both statistically significant at the $\alpha = .05$ level, were inserted (Model 2). To test whether Model 2 (with interactions) fit significantly better than Model 1 (without interactions), we used the deviance difference test (or likelihood ratio test; Hox, Moerbeek, & van de Schoot, 2010). It consists of comparing the likelihood of the two models (Model 1 and Model 2) by looking at the difference in their logarithms (to see more, please refer to Hox et al., 2010).

Since AUDIT and PGSI scores are generally non-Gaussian, a bootstrap technique was used to further estimate the statistical significance of the values observed (Efron & Tibishirani, 1993).

Results

Confirmatory Factor Analysis

The original factor structure of all instruments was identified through confirmatory analysis: a single-factor structure for the S-BDI (fit index: comparative fit index (CFI) = .926; Tucker-Lewis index (TLI) = .912; standardized root mean square residual (SRMR) = .045; Cronbach's $\alpha = .876$), a five-factor structure (negative urgency, positive urgency, lack of premeditation, lack of perseverance, and sensation seeking) for the S-UPPS-P (CFI = .924, TLI = .909, SRMR = .06), and a single-factor structure for AUDIT (CFI = .965; TLI = .947; SRMR = .03; Cronbach's $\alpha = .918$) and PGSI (CFI = .977; TLI = .954; SRMR = .023; Cronbach's $\alpha = .893$). The composition of the S-UPPSS-P subscales was as follows: negative urgency: Items 6, 8, 13, and 15 (Cronbach's $\alpha = .784$); positive urgency: Items 3, 10, 17, and 20 (Cronbach's $\alpha = .837$); lack of premeditation: Items 2, 5, 12, and 19 (Cronbach's $\alpha = .874$); lack of perseverance: Items 1, 4, 7, and 11 (Cronbach's $\alpha = .881$); and sensation seeking: Items 9, 14, 16, and 18 (Cronbach's $\alpha = .711$). Items 13 and 15 were aggregated, as were Items 16 and 18, in order to increase indices of fitness and to obtain a better estimate of the measure.

To improve the measurement model, we eliminated items that reduced the parameters of fitness in the questionnaires. Items 1–3 were dropped for AUDIT, as they concern the frequency and the quantity of alcohol use, whereas the items retained concern aspects related to alcohol dependence and problems derived from alcohol use during the past year. Items 1, 6, 8, and 9 were dropped for PGSI, as they concern gambling-related health, financial and family problems, and sense of guilt, whereas the items retained concern gambling tolerance, losing and chasing, borrowing money, awareness of problems, and criticisms from other people.

Dimensions of Cultural Models

After applying the Benzécri formula of inertia adjustment (Benzécri, 1973), we found that the first factorial dimension of the ISE (ISE1) accounted for 35.26% of the inertia, the second dimension (ISE2) accounted for 13.73%, and the third dimension (ISE3) accounted for 7.82%. On the whole, these three factorial dimensions accounted for 56.81% of the total inertia expressed. Appendices A, B, and C show the most significant response modalities characterizing ISE1, ISE2, and ISE3 polarities, respectively. Henceforth, we use capitals for labelling the dimensions of sense and italics for the interpretation of polarities.

ISE1. Models of evaluation of the social environment: Moderation versus reactivity.

This dimension opposes two response patterns that we interpret as markers of two particular ways of perceiving and evaluating the social environment. On the *Moderation* polarity (–), responses adopting intermediate points on the Likert scales (i.e., quite agree, quite reliable) are aggregated. There is a positive image of the environment (i.e., people and services are perceived as reliable), although some critical aspects are perceived (i.e., respondents feel worried and pessimistic about the future). On the *Reactivity* polarity (+), responses adopting the extremes on the Likert scales (e.g., *very much*, *not at all*) are aggregated; the social environment is perceived in black and white.

ISE2. Relation with the social environment: Unrepresentability versus retreat.

This dimension of sense opposes two ways in which people relate within their context. For *Unrepresentability* (–), missing answers co-occur to characterize this polarity. The “un-answers” refer to questions connected to relationships with the micro and macro social environment, for instance, how subjects perceive Italians, their colleagues, their friends, their family. Thus, it is reasonable that the “un-answer” is not simply an absence of response, but information on a certain attitude towards certain fields of experience, which does not appear to be representable for the respondents positioned along this polarity (for a similar interpretation of the missing answers, see Salvatore, Mannarini, & Rubino, 2004). On the *Retreat* polarity (+), an opposing interpretation of the macro and micro social context is offered. On the one hand, the macro social context is depicted as an anomic scenario: Institutions are not reliable and all the problems in Italy are due to incompetence and inefficiency; Italians are desperate and resigned. On the other hand, the micro social context is depicted as an oasis: Family, friends, and colleagues are perceived as competent, reliable, and influential.

ISE3. Reaction to the social environment: Sense of belonging versus disaffection.

This dimension represents the way people interact with their social world, in particular how they react to it. On the *Sense of belonging* polarity (–), the responses signal a positive attitude towards the social environment: People are glad to belong to Italy and to their local territory; institutions, from police to health services, seem reliable; Italians are perceived as optimistic and trustworthy; the territory is bound to improve, and everyone can collaborate in achieving this through studying, working, following the rules, and so on. On the *Disaffection* polarity (+), the responses

indicate an uninvolved, detached reaction to the social environment: People do not feel a bond with their town or with Italy and Europe; both the macro and micro social context are perceived as unreliable, incapable, incompetent, and inefficient; and the territory is doomed not to develop in the future.

Table 2 shows the ISE, S-UPPS-P, and S-BDI means associated with the recruitment contexts. Significant differences were found on all measures of interest.

Effects and Moderating Role of Cultural Models

In the following paragraphs, the results of mixed models are presented, sorted by behaviour. A bootstrap 95% confidence interval resulting from 5,000 resamples with replacement (Efron & Tibishirani, 1993) is reported in the tables. Bootstrap estimates relate to the measure of interest and their interaction proved to be stable.

Alcohol. The simple model shows a significant positive influence of ISE1 (*Models of evaluation of social environment*) (Table 3): The more that people evaluate their social environment in an absolute way (positive polarity of ISE1), the more they drink harmfully. The random intercept was not significant (Wald $Z = .901$): The effects of models of evaluation of the social environment (ISE1) on addictions showed no significant difference in the contexts considered.

In the second phase, impulsivity and depression were inserted in the model. The parameters show that the three factors of impulsiveness relate to hazardous drinking (Table 4; likelihood ratio test = 73.5, $df = 6$, $p < .001$).

Lack of perseverance and sensation seeking show a positive association: When the scores on these scales rise, the score on alcohol rises, too. On the other hand, there is a negative association with premeditation. Furthermore, depression proves to have a significant association with AUDIT scores: Those with higher scores on the S-BDI generally scored higher on the problem drinking scale. It is worth noticing that when the variables were entered, ISE1 retained its significance. Furthermore, the model shows a significant negative influence of ISE3 (*Reaction to social environment*): The more that people show a sense of belonging (negative polarity of ISE3), the more they drink harmfully. For this model, the random intercept was not significant (Wald $Z = .713$).

The last step entailed considering the interaction between the measures of interest (Table 5; likelihood ratio test = 16.6, $df = 1$, $p < .001$). As a result of the interaction input, the variables of the previous model that maintained their significance were ISE1, ISE3, sensation seeking, and depression. There was a significant positive interaction between ISE1 and depression scores (Figure 1): The more depressed people are and the more they evaluate their social environment in absolute terms, the more likely they are to drink harmfully. Furthermore, there is a significant negative interaction between ISE2 and depression: The higher people are on the *Retreat* polarity, the less likely they are to engage in hazardous drinking. Finally, depression proved to have a significant positive

Table 2
ISE, S-UPPS-P, and S-BDI Means (SDs) Associated With the Recruitment Contexts

Variable	University	Sites for drinking and gambling	Health services and support setting	Total	Significance		
					<i>F</i>	<i>df</i>	<i>p</i>
ISE1	-0.29 (0.227)	0.09 (0.529)	0.064 (0.469)	-0.005 (0.479)	18.87	2/326	<.0001
ISE2	0.039 (0.252)	0.111 (0.337)	-0.123 (0.429)	0.009 (0.371)	13.96	2/326	<.0001
ISE3	-0.046 (0.332)	0.064 (0.315)	-0.025 (0.364)	0.007 (0.340)	3.38	2/326	<.05
Negative urgency (S-UPPS-P)	0.367 (0.802)	-0.295 (0.728)	0.085 (0.719)	-0.009 (0.786)	20.23	2/318	<.0001
Lack of perseverance (S-UPPS-P)	0.518 (1.005)	-0.338 (0.565)	0.064 (0.888)	0.000 (0.865)	27.48	2/318	<.0001
Lack of premeditation (S-UPPS-P)	0.409 (0.801)	-0.268 (0.477)	0.053 (0.650)	0.000 (0.676)	28.34	2/318	<.0001
Sensation seeking (S-UPPS-P)	0.348 (0.715)	-0.237 (0.59)	0.043 (0.646)	-0.005 (0.677)	20.22	2/318	<.0001
Positive urgency (S-UPPS-P)	0.399 (0.772)	-0.284 (0.565)	0.069 (0.630)	-0.004 (0.692)	28.02	2/318	<.0001
Depression (S-BDI)	-0.069 (0.349)	-0.09 (0.453)	0.112 (0.505)	-0.013 (0.460)	6.97	2/320	.001

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire; S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

Table 3
Parameters of Simple Model for Alcohol

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.026	0.080	2.814	-0.327	0.766	-0.292	0.239	-.100	.055
ISE1 ^b	0.268	0.084	303.508	3.182	0.002	0.102	0.433	.058	.484
ISE2 ^c	-0.222	0.118	315.739	-1.878	0.061	-0.454	0.011	-.624	.009
ISE3 ^d	-0.063	0.115	316.267	-0.547	0.585	-0.288	0.163	-.335	.223
Random effect				Wald Z					
Residual	0.471	0.038		12.526	0.000	0.403	0.551	.308	.616
Intercept	0.015	0.016		0.901	0.368	0.002	0.129	.000	.049

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Relation with social environment: unrepresentability (-) versus retreat (+)

^d Reaction to social environment: sense of belonging (-) versus disaffection (+)

Table 4
Parameters of Model 1 (All Predictive Variables) for Alcohol

Parameter	Estimate	SE	df	T	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.019	0.063	2.156	-0.305	0.787	-0.271	0.233	-0.086	.053
ISE1 ^b	0.172	0.076	280.884	2.260	0.025	0.022	0.321	-0.004	.357
ISE2 ^c	-0.156	0.107	314.624	-1.457	0.146	-0.368	0.055	-0.421	.034
ISE3 ^d	-0.379	0.110	316.393	-3.448	0.001	-0.595	-0.163	-0.645	-.083
Negative urgency (S-UPPS-P)	0.125	0.181	313.095	0.689	0.492	-0.232	0.482	-0.411	.638
Lack of premeditation (S-UPPS-P)	0.357	0.168	316.836	2.132	0.034	0.028	0.687	-0.023	.767
Lack of perseverance (S-UPPS-P)	-0.683	0.292	316.817	-2.336	0.020	-1.258	-0.108	-1.386	-.041
Sensation seeking (S-UPPS-P)	0.283	0.126	313.058	2.246	0.025	0.035	0.531	-0.034	.615
Positive urgency (S-UPPS-P)	-0.099	0.304	316.154	-0.327	0.744	-0.698	0.499	-0.948	.795
Depression (S-BDI)	0.703	0.086	316.858	8.147	0.000	0.534	0.873	.449	.924
Random effect				Wald Z					
Residual	0.374	0.030		12.507	0.000	0.320	0.438	.239	.483
Intercept	0.008	0.011		0.713	0.476	0.001	0.125	.000	.035

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Relation with social environment: unrepresentability (-) versus retreat (+)

^d Reaction to social environment: sense of belonging (-) versus disaffection (+)

Table 5
Parameters of Model 2 (All Predictive Variables and Interactions) for Alcohol

Parameter	Estimate	SE	df	T	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.053	0.074	2.624	-0.710	0.536	-0.310	0.204	-.123	.019
ISE1 ^b	0.150	0.078	305.007	1.940	0.053	-0.002	0.303	-.034	.347
ISE3 ^c	-0.285	0.108	316.866	-2.652	0.008	-0.497	-0.074	-.552	-.008
Sensation seeking (S-UPPS-P)	0.123	0.055	311.303	2.219	0.027	0.014	0.231	.005	.243
Depression (S-BDI)	0.520	0.098	316.797	5.307	0.000	0.327	0.712	.297	.739
Sensation seeking(S-UPPS-P) * ISE1	-0.048	0.103	316.949	-0.467	0.641	-0.251	0.155	-.269	.132
Depression (S-BDI) * ISE1	0.425	0.152	314.180	2.801	0.005	0.126	0.723	.144	.772
Depression (S-BDI) * ISE2	-0.620	0.221	313.495	-2.808	0.005	-1.055	-0.186	-1.639	-.144
Lack of perseverance (S-UPPS-P) *	-0.419	0.155	314.017	-2.710	0.007	-0.724	-0.115	-.801	-.028
Depression (S-BDI)									
Sensation seeking (S-UPPS-P) *	0.512	0.170	313.935	3.001	0.003	0.176	0.847	.053	.883
Depression (S-BDI)									
Random effect				Wald Z					
Residual	0.354	0.028		12.519	0.000	0.303	0.414	.214	.474
Intercept	0.013	0.014		0.878	0.380	0.001	0.118	.000	.042

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Reaction to social environment: sense of belonging (-) versus disaffection (+)

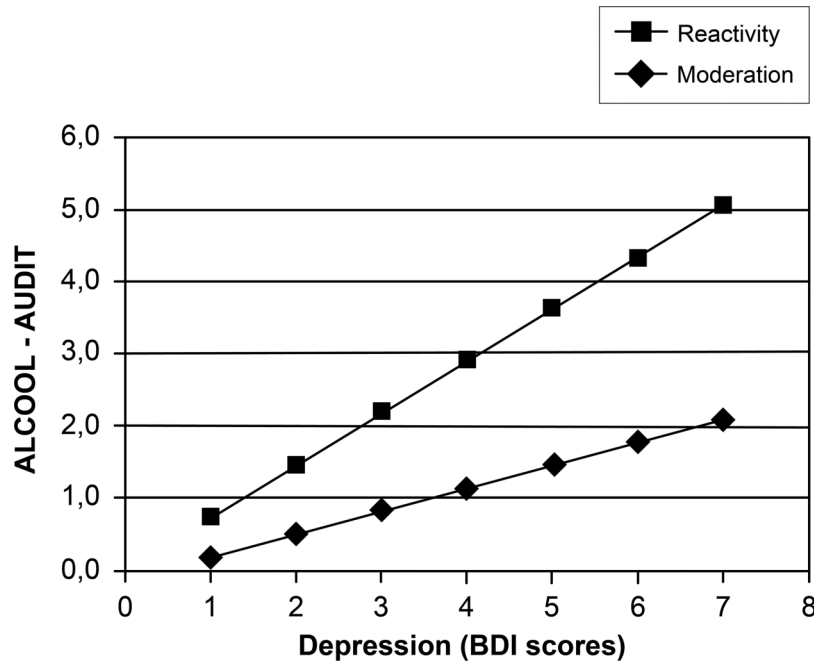


Figure 1. Simple slope of interaction between models of evaluation of the social environment (ISE1) and Short Beck Depression Inventory (S-BDI) on Alcohol Use Disorders Identification Test (AUDIT).

interaction with sensation seeking and a significant negative interaction with lack of premeditation. The random intercept for this model was not significant (Wald $Z = .878$).

Gambling. ISE1 and ISE2 appear to be related to gambling (Table 6). In particular, ISE1 is positively correlated to gambling. As is the case for alcohol, a reactive evaluation of the environment is associated with a higher probability of harmful gambling. ISE2 is negatively associated with gambling; thus, the more people's social environment is *unrepresentable*, the more they gamble harmfully. The random effect was not significant (Wald $Z = .157$), which means the effects of cultural models on harmful behaviours show no significant differences in the contexts considered.

When entering the other predictive variables, the effect of ISE1 remained stable, and ISE2 was no longer associated with hazardous gambling (Table 7; likelihood ratio test = 29.8, $df = 6$, $p < .001$). Furthermore, the analysis shows that a dimension of impulsivity—sensation seeking—and depression are related to gambling. The higher the score on the sensation-seeking scale and on the depression scale, the higher the score on problem gambling. The random intercept was not significant (Wald $Z = .369$).

In order to explore the moderation of cultural models, we entered the interactions between the measures of interest (Table 8; likelihood ratio test = 12.7, $df = 5$, $p < .05$). Following the input of interaction, the variables that proved to be related to PGSI scores were ISE1 and sensation seeking. Furthermore, these variables appear to be related to a significant degree (Figures 2 and 3): The more absolute the evaluation of the social environment and the more that people “seek strong

Table 6
Parameters of Simple Model for Gambling

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.002	0.023	1.507	-0.098	0.933	-0.142	0.137	-.045	.042
ISE1 ^b	0.147	0.044	185.304	3.338	0.001	0.060	0.235	.022	.275
ISE2 ^c	-0.151	0.063	191.505	-2.405	0.017	-0.276	-0.027	-.373	-.007
ISE3 ^d	0.041	0.062	301.465	0.660	0.510	-0.081	0.163	-.173	.235
Random effect				Wald Z					
Residual	0.137	0.011		12.300	0.000	0.116	0.160	.074	.198
Intercept	0.000	0.002		0.157	0.875	0.000	74.837	.000	.006

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire.

^a Bootstrap results are based on 5,000 bootstrap samples.

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+).

^c Relation with social environment: unrepresentability (-) versus retreat (+). ^d Reaction to social environment: sense of belonging (-) versus disaffection (+).

Table 7
Parameters of Model 2 (All Predictive Variables) for Gambling

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.003	0.028	1,298	-0.108	0.928	-0.210	0.204	-.044	.041
ISE1 ^b	0.128	0.043	210.494	2.971	0.003	0.043	0.214	.016	.252
ISE2 ^c	-0.105	0.062	279.974	-1.699	0.091	-0.228	0.017	-.316	.022
ISE3 ^d	-0.020	0.063	288.354	-0.320	0.749	-0.145	0.105	-.242	.176
Negative urgency (S-UPPS-P)	0.110	0.105	301.780	1.045	0.297	-0.097	0.317	-.123	.334
Lack of premeditation (S-UPPS-P)	-0.033	0.096	305.121	-0.338	0.735	-0.222	0.157	-.185	.146
Lack of perseverance (S-UPPS-P)	0.075	0.169	307.855	0.446	0.656	-0.257	0.407	-.262	.361
Sensation seeking (S-UPPS-P)	0.205	0.073	302.820	2.806	0.005	0.061	0.350	.034	.410
Positive urgency (S-UPPS-P)	-0.272	0.176	307.755	-1.542	0.124	-0.619	0.075	-.669	.139
Depression (S-BDI)	0.168	0.050	300.651	3.379	0.001	0.070	0.266	.032	.299
Random effect				Wald Z					
Residual	0.124	0.010		12.277	0.000	0.105	0.145	.065	.178
Intercept	0.001	0.003		0.369	0.712	0.000	0.205	.000	.008

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire; ISE2, second factorial dimension of the Interpretation of the Social Environment questionnaire; ISE3, third factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

^c Relation with social environment: unrepresentability (-) versus retreat (+)

^d Reaction to social environment: sense of belonging (-) versus disaffection (+)

Table 8
Parameters of Model 2 (All Predictive Variables and Interactions) for Gambling

Parameter	Estimate	SE	df	t	Significance	95% Confidence interval		Bootstrap 95% confidence interval ^a	
						Lower bound	Upper bound	Lower bound	Upper bound
Intercept	-0.017	0.032	1.988	-0.538	0.645	-0.155	0.121	-0.058	.028
ISE1 ^b	0.146	0.044	259.031	3.328	0.001	0.060	0.232	.011	.288
Sensation seeking (S-UPPS-P)	0.131	0.031	270.783	4.187	0.000	0.070	0.193	.060	.210
Sensation seeking (S-UPPS-P) * ISE1	0.183	0.058	307.948	3.151	0.002	0.069	0.297	.012	.373
Sensation seeking (S-UPPS-P) *	0.204	0.067	304.559	3.067	0.002	0.073	0.335	-.020	.395
Depression (S-BDI)									
Random effect				Wald Z					
Residual	0.122	0.010		12.317	0.000	0.104	0.143	.066	.181
Intercept	0.002	0.003		0.577	0.564	0.000	0.052	.000	.009

Note. ISE1, first factorial dimension of the Interpretation of the Social Environment questionnaire. S-UPPS-P, short form of the UPPS-P Impulsive Behavior Scale; S-BDI, Short Beck Depression Inventory.

^a Bootstrap results are based on 5,000 bootstrap samples

^b Models of evaluation of the social environment: moderation (-) versus reactivity (+)

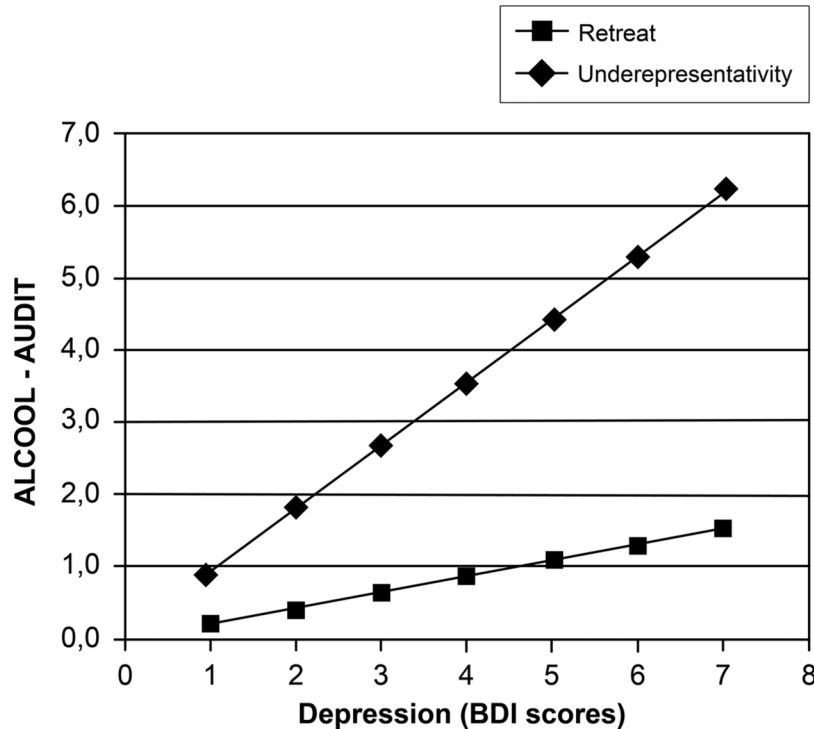


Figure 2. Simple slope of interaction between the relationship with social environment (ISE2) and Short Beck Depression Inventory (S-BDI) on Alcohol Use Disorders Identification Test (AUDIT).

sensations,” the more likely they are to engage in hazardous gambling. There is also a significant positive interaction between sensation seeking and depression. For this model, too, the random intercept was not significant (Wald $Z = .577$).

Discussion

In the present study, we examined the relationship among impulsivity, depression, cultural models, and hazardous drinking and gambling. Consistent with Hypothesis a (a positive association between impulsivity and target hazardous behaviours), a specific factor of impulsivity—sensation seeking—proved to have a significant connection with both hazardous drinking and hazardous gambling. According to the theory of sensation seeking proposed by Zuckerman (1979, 1994), people with high scores on sensation seeking have a strong need for varied and intense stimulation; previous studies, in agreement with this theory, showed that individuals who seek intense and possibly novel forms of sensation are more likely to develop problems with drinking (Adams, Kaiser, Lynam, Charnigo, & Milich, 2012; Connors & Sobell, 1986; Simons, Gaher, Correia, Hansen, & Christopher, 2005) and gambling (Cyders & Smith, 2008; Fortune & Goodie, 2010; Nower et al., 2004; Powell, Hardoon, Derevensky, & Gupta, 1999). However, results on the association between the different impulsiveness traits of the UPPS model and gambling and drinking problems are not conclusive, since different traits of impulsiveness appear to be related to these hazardous behaviours in different studies (Whiteside & Lynam, 2003). For instance, Smith and colleagues (2007), in a study with undergraduate students, found that

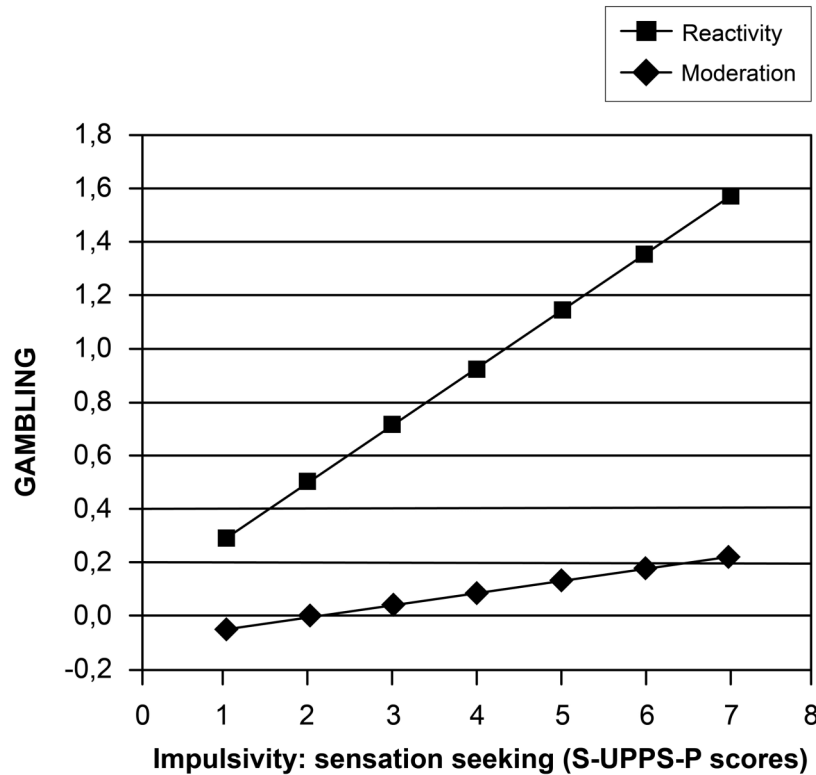


Figure 3. Simple slope of interaction between models of evaluation of the social environment (ISE1) and Impulsive Behaviour Scale – Sensation Seeking (S-UPPS-P) on the Problem Gambling Severity Index (PGSI).

sensation seeking was associated with the frequency of engaging in risky behaviours (including drinking and gambling), whereas urgency was related to problem levels of involvement in those behaviours. Cyders and Smith (2008) found that that positive urgency, lack of planning, and sensation seeking all related to both gambling behaviour and general risky behaviour (e.g., mountain climbing) cross-sectionally in a sample of college students, but only positive urgency predicted longitudinal increases in gambling behaviour. The study by Verdejo-García, Bechara, Recknor, and Pérez-García (2007) of 36 individuals with substance dependence (including alcohol) and 36 drug-free controls revealed that those with substance dependence show high scores on dimensions of urgency, lack of perseverance, and lack of premeditation, but not on sensation seeking. Differences in the sample (i.e., country, race, education levels, age) and design (i.e., cross-sectional vs. longitudinal) of these studies may explain these differences in results. For instance, some scholars have suggested that age differences may explain differences in the role of urgency in hazardous behaviours (Canale, Viena, Griffiths, Rubaltelli, & Santinello, 2015; Whiteside & Lynam, 2003).

With regard to Hypothesis b, the expected association between depression and hazardous behaviours was confirmed. Depression, both alone and in interaction with sensation seeking, was shown to have a significant relation to hazardous drinking. The results are consistent with the findings from previous studies. The literature

suggests that alcoholics with coexisting depression exhibit heavier alcohol abuse, severer physical damage, and greater vulnerability to both psychotropic drug abuse and overdose behaviour than do non-depressive alcoholics (Burke, Oberklaid, & Burgess, 2004; Hall, 2012). Furthermore, it was suggested that people with depression may engage in problem drinking in part because negative affect is detrimental to their ability to control impulsive behaviour (Cyders & Smith, 2008). Based on the results of our study, depression is not directly associated with gambling, but is associated with it when in interaction with sensation seeking. This finding deserves comment. Although the direction of causality has not been established, the association between gambling and depression was suggested by previous research studies (Griffiths & Wood, 2000; Gupta & Derevensky, 1998; Lynch et al., 2004), as well as by clinical reports in which gambling is seen as a defence against depression (Blaszczynski et al., 1986) or a coping strategy to deal with depression and/or anxiety. However, gamblers are not a homogeneous group (Zimmermann, Meeland, & Krug, 1985). It may well be that differences in personality traits and environmental factors (i.e., exposure to stressful circumstances, stigmatization) weigh differently in depression, thereby accounting for the discordant findings among studies. The findings of our study reveal, for instance, a significant interaction between depression and impulsivity-sensation seeking. This means that, although depression appears not to have a direct effect on hazardous gambling, it may favour hazardous gambling in people in search of intense sensations and ready to take physical and social risks for the sake of such experiences. Previous studies reveal the role of impulsivity traits in mediating the relationship between depression and hazardous gambling (Clarke, 2006; Dussault, Brendgen, Vitaro, Wanner, & Tremblay, 2011). Further research is needed to examine this issue in greater depth.

With regard to cultural models, we have suggested that the way people interpret their social environment may play a major role in their engagement in hazardous drinking and gambling and in moderating the impact of their levels of impulsivity and depression. Analysis has shown that different cultural models are associated with different probabilities of each of the hazardous behaviours investigated. More specifically, they have shown that the component related to the social environment evaluation model (ISE1) affects the probability of both hazardous drinking and hazardous gambling. The individuals tending to adopt the *Reactivity* cultural polarity are more prone to drink harmfully and to gamble: Heavy drinkers and gamblers perceive their world as an extremely anomic environment. One can see that reactivity corresponds to a highly negative connotation of the social environment, perceived as an extremely anomic place where people cannot trust anybody, and even institutions, politics, and public services appear to be unreliable; there is no faith in the future and the present is the only representable experience. The findings are consistent with previous studies that used the ISE questionnaire (Venuleo, Calogiuri, & Rollo, 2015; Venuleo et al., 2016; Venuleo, Salvatore, & Mossi, 2015): Hazardous gamblers and hazardous drinkers, compared with a control group, were found to have a negative attitude towards the social environment, characterized by highly negative connotations. One possible way of interpreting the result is that such

a bad view of the social environment fuels negative affect (stress, loneliness, helplessness, and other intolerable feelings) and the need to indulge in gambling and drinking as a way to escape from feelings and situations that are felt to be unbearable. This view is consistent with clinical reports and several influential theoretical models (e.g., stress-coping model, Wills & Shiffman, 1985; self-medication model, Khantzian, 1997) that underline the important role played by negative affect in promoting hazardous behaviour (gambling: Blaszczynski & McConaghy, 1989; Gupta et al., 2004; Rosenthal, 1986; hazardous drinking: Holahan et al., 2001; Leigh, 1989) but stresses that the social environment can constitute a source of malaise and negative feeling (Borrell & Boulet, 2005). Another compatible hypothesis is that the view of the social environment affects the assessment of risks related to the behaviour (Venuleo, Mossi, & Marinaci, 2017) and identification with the community's values and norms. Research has extensively suggested that social trust facilitates social control through commitment to the community's values and norms. In the same vein, if social trust erodes, people will be less likely to identify with the rules in their own conduct (Rahn & Transue, 1998; Rotter, 1980) and more likely to adopt risky behaviours (Åslund & Nilsson, 2013; McPherson et al., 2013). Ahnquist, Lindström, and Wamala (2008), in analysing data from the 2006 Swedish National Survey of Public Health, showed that low institutional trust was associated with an increased risk of harmful alcohol consumption. The authors suggest that distrust in society may contribute to the lack of positive lifestyle behaviours.

The results also show the significant relationship between ISE3 (reaction to social environment) and hazardous drinking: Subjects tending to express a *Sense of belonging* to the country where they live are also more prone to problem drinking. This result is not obvious, but it is at any rate understandable. On the one hand, previous studies have connected problem drinking to psychosocial factors such as loneliness and feelings of alienation (Paluoso, 2000; Rostosky, Owens, Zimmerman, & Riggle, 2003), which one can expect to be associated with disaffection more than with a sense of belonging. On the other hand, some authors have suggested that drinking might favour social grouping, respond to affiliation needs, and be a means to define oneself as part of a subculture. For instance, the in-depth ethnographic fieldwork of West (2001) shows that in two American subcultures, the fraternity and the U.S. Navy, which are noteworthy for alcohol use, drinking males create a masculine “in-group” that defines what masculinity means to the group and favours group cohesion. The anthropological study of the day-to-day lifestyle of skinheads living in Perth (Australia) conducted by Moore (1994) shows the significance of drinking for skinhead group affiliation and personal identity. Other studies have suggested that people's drinking may be related to self-pressure to conform to group norms in order to gain social approval and facilitate social interaction (see Petraitis, Flay, & Miller, 1995). From this perspective, drinking may serve the sense of belonging to a group, rather than reflecting disaffection. The association between drinking and sense of belonging or disaffection may also depend on contextual factors. In any case, this association needs to be explored in greater depth.

The results do not offer support to the supposed moderating role of cultural models on the effect of impulsivity with respect to hazardous drinking. A significant interaction was found with respect to hazardous gambling. More specifically, ISE1, the models of evaluation of the macro social environment, proved to have a significant interaction with impulsivity and sensation seeking. The more people tend to evaluate the social environment reactively and the more they feel they live in a very unreliable and anomic place, the stronger the relation between sensation seeking and hazardous gambling. It seems reasonable that within an anomic semiotic scenario, gambling acquires the meaning of being a source of heightened sensations in an environment that seems meaningless and detrimental. Another compatible hypothesis is that people expressing a view of the social environment as untrustworthy will be less likely to identify with the rules in their own conduct (Rahn & Transue, 1998) and more likely to express their impulsivity through hazardous behaviours that are less socially accepted. This hypothesis is consistent with the suggestion that identification with their micro social environment acts as a protective factor against harmful behaviours associated with socially undesirable ends, both for individuals and for their micro contexts (Manton, Pennay, & Savic, 2014).

The results do not offer support for the supposed moderating role of cultural models in depression with regard to hazardous gambling. Significant interactions were found between depression scores and two components of the cultural model, ISE1 and ISE3, with respect to hazardous drinking. More specifically, for ISE1, evaluating the social environment in a reactive way increases the effect of depression on hazardous drinking. This aspect is easily understood if we consider that a negative approach homogeneously applied to all contexts of people's life could make them think that a solution is hard to find. Several studies (Colder, 2001; Miranda, Meyerson, Long, Marx, & Simpson, 2002) show that alcoholics consider their addiction as the only possible result of their life, since there is no way to improve the way they live. From this perspective, our results suggest how important work may be for the development of a positive image of the social environment. Trust in politics, public service, and one's capacity to improve one's own condition does not have a minor role in attenuating feelings of desperation, which, in turn, may affect hazardous behaviour. With respect to ISE2 (the component of the cultural models regarding the relation with the social environment), the higher people are on the *Unrepresentability* polarity, where Italians and respondents' colleagues, friends, and family are not defined, the more depressed they are, and the more likely they are to engage in hazardous drinking. By contrast, the higher people score on the *Retreat* polarity, where family, friends, and colleagues are idealized as a happy, reliable oasis compared with the wider anomic social environment, the slighter the association between their level of depression and their likelihood of engaging in problem drinking. Previous studies have documented the interaction between depression, family and work relationships, and climate quality, that is, parent-child conflict, marital conflict, commitment to family rules, perceived support at work, and work pressure (El-Sheikh & Flanagan, 2001; Grzywacz & Marks, 2000), in affecting alcohol consumption. Our findings suggest that how one's micro social environment is represented is another key variable in the association between depression and drinking.

Limitations

The results of the present study should be considered in light of several methodological limitations. First, our case study is based on a convenience sample in south-eastern Italy. Previous studies in the same area have already shown the relationship between a critical view of the social environment and hazardous behaviours (Venuleo, Salvatore, & Mossi, 2015; Venuleo et al., 2016). However, we might suppose that in other countries where there is a generalized trust in politics and institutions, trustworthiness is not a relevant criterion to differentiate people's cultural models and individuals' probability of engaging in hazardous behaviour. More broadly, in different populations, different cultural models might work as either protective factors or as risk factors. The generalization of results needs to be treated with caution. What does appear to be generalizable is the relationship between cultural models and target addictions; nevertheless, the content, strength, and nature of this relationship is probably context specific (Venuleo, Salvatore, & Mossi, 2015).

Second, appropriate caution should be exercised in drawing causal inferences from data. We proposed an interpretation of the cultural models as a factor of vulnerability towards hazardous behaviours, but this relationship is likely to be reciprocal to some extent. For example, our study does not allow us to rule out that the high level of distrust in the social environment is the by-product of problems with gambling or drinking, or that cultural models and hazardous behaviours feed off each other. Similarly, impulsivity and depression may be either risk factors for hazardous gambling and drinking or an effect but may also have a bidirectional relationship. Future work to clarify the nature of this interaction is warranted.

Third, we have to acknowledge that other individual and psychosocial factors may mediate the effects of the variables investigated or suggest alternative hypotheses. Fourth, we adopted only one instrument—the questionnaire on the Interpretation of the Social Environment (ISE)—to detect cultural models. Even though its construction criteria are consistent with the idea that culture is made up of generalized meanings, the questionnaire allows us to detect how people interpret some domains of experience and not others, and does not allow us to take into account that the features of a culture are not the same over time (Valsiner, 2003). Finally, the decision to use measures based on the CFAs for our variables of interest allows less appropriate comparisons with the existing literature. On the other hand, CFAs confirm the factor structures of the instruments, and by dropping items, we were able to obtain more appropriate measures for our sample.

Conclusion

Despite these limitations, the findings deserve attention. At the theoretical level, the results support the idea that the system of meanings by which people interpret their experience is an important aspect in the analysis of the social and psychosocial dynamics of hazardous behaviours. People from the same country show different

probabilities of manifesting problems with drinking or gambling related to the cultural models through which they make sense of their social experience and environment. Furthermore, cultural models appear to interact with impulsiveness traits associated with hazardous gambling and with the vulnerability to depression associated with hazardous drinking. On the whole, the results suggest an integrated model of hazardous behaviours wherein cultural models play a significant role in moderating the path of individual vulnerability to problem drinking and problem gambling. The findings encourage an in-depth investigation of the interplay between cultural factors and other risk factors documented by the literature.

At the methodological level, the study suggests the need to improve prevention programmes and strategies of intervention focused on the recognition and elaboration of the subjects' cultural models, which seem to offer a shared terrain for the onset of different kinds of hazardous behaviours. Knowledge of cultural models can provide valuable information for the design of health programmes addressed to individuals, as well as to the intersubjective life worlds within which people's cultural models develop.

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Appendix A

Response Modalities Most Significantly Associated With the First Factorial Dimension (ISE1) of the Interpretation of the Social Environment Questionnaire

Test value	Item	Response modality
Moderation		
-6.61	I feel I belong mostly to Italy	Quite agree
-6.37	Do you like living in Italy?	Quite agree
-6.17	In your opinion, in general, nowadays to what extent are Italians worried/confident?	Quite worried
-6.02	Sometimes I need to bend the rules to help people I care for	Quite agree
-5.80	People can rely only on themselves	Quite agree
-5.63	In your opinion, in the town where you live, to what extent are the inhabitants interested in themselves and their family?	Quite agree
-5.59	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Quite pessimistic
-5.58	It is currently impossible to make predictions for the future	Quite disagree
-5.53	Public job centers	Quite unreliable
-5.47	Colleagues	Quite reliable
-5.38	In your opinion, in general, nowadays to what extent are Italians practical/idealistic?	Quite idealistic
-5.35	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Quite optimistic
-5.35	I don't worry about my future because there is someone else who takes care of it	Quite disagree
-5.35	In your opinion, in the medium term, what will be the degree of development of your area?	Quite low
-5.31	It is currently impossible to make predictions for the future	Quite disagree
Reactivity		
10.40	Italians are committed to improving the collective coexistence	Strongly disagree
10.34	In your opinion, in general, nowadays to what extent are Italians passive/active?	Very passive
10.28	In your opinion, in the medium term, what's the possibility of Italy developing?	Very low
9.73	Public job centers	Very unreliable
9.61	Public administration	Very unreliable
9.57	In your opinion, in general, nowadays to what extent are Italians practical/unrealistic?	Very unrealistic
9.13	In your opinion, in the medium term, what will be the degree of development of the town you live in? (reverse item)	Very high
9.09	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Very pessimistic
9.07	In the town where you live, the inhabitants are committed to improving the collective coexistence	Strongly disagree
8.99	Health services	Very unreliable
8.93	It will be more and more difficult to find people to trust	Strongly agree
8.84	I am happy to live in Italy	Strongly disagree
8.78	In your opinion, how important is it to follow the rules?	Not at all important

Table Continued.

Test value	Item	Response modality
8.73	In your opinion, in general, nowadays to what extent are Italians hopeless/calm?	Very hopeless
8.65	I feel I belong mostly to Italy	Strongly disagree

Appendix B

Response Modalities Most Significantly Associated With the Second Factorial Dimension (ISE2) of the Interpretation of the Social Environment Questionnaire

Test value	Item	Response modality
Unrepresentability		
-14.48	In your opinion, in general, nowadays to what extent are Italians skillful/unskillful?	Missed answer
-14.27	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Missed answer
-13.98	If you think about the future, do you feel hopeless/calm?	Missed answer
-13.91	In your opinion, in general, nowadays to what extent are Italians practical/unrealistic?	Missed answer
-13.51	Are your friends influential/uninfluential?	Missed answer
-13.39	Are your friends reliable/unreliable?	Missed answer
-13.33	If you think about the future, do you feel optimistic/pessimistic?	Missed answer
-13.19	In your opinion, in general, nowadays to what extent are Italians hopeless/calm?	Missed answer
-12.81	Is your family influential/uninfluential?	Missed answer
-12.77	In your opinion, in general, nowadays to what extent are Italians active/passive?	Missed answer
-12.57	If you think about the future, do you feel hopeless/calm?	Missed answer
-12.23	In your opinion, in general, nowadays to what extent are Italians worried/confident?	Missed answer
-12.16	Is your family reliable/unreliable?	Missed answer
-12.14	Are your friends capable/incapable?	Missed answer
-12.10	If you think about the future, do you feel worried/confident?	Missed answer
Retreat		
5.64	Are your friends reliable/unreliable?	Missed answer
5.51	Is your family reliable/unreliable?	Very reliable
5.20	Are your colleagues capable/incapable?	Very reliable
5.03	Are your friends capable/incapable?	Very capable
5.01	In your opinion, in general, nowadays to what extent are Italians optimistic/pessimistic?	Very capable
4.82	Italy's issues are due to lack of skills	Very pessimistic
4.78	Your family is capable/incapable?	Strongly agree
4.76	Italy's issues are due to the inefficiency of the State	Very capable
4.57	It is currently impossible to make predictions for the future	Strongly agree
4.56	In your opinion, in general, nowadays to what extent are Italians active/passive?	Strongly disagree
4.55	In the town where you live, inhabitants are committed to improving the collective coexistence	Very passive
4.50	In your opinion, in general, nowadays to what extent are Italians practical/idealistic?	Strongly disagree
4.44	Is your family influential/uninfluential?	Very idealistic
		Very influential

Table Continued.

Test value	Item	Response modality
4.30	In the town where you live, inhabitants are committed to improving the collective coexistence	Strongly disagree
4.14	In your opinion, in general, nowadays to what extent are Italians practical/idealistic?	Very idealistic

Appendix C

Response Modalities Most Significantly Associated With the Third Factorial Dimension (ISE3) of the Interpretation of the Social Environment Questionnaire

Test value	Item	Response modality
Sense of belonging		
-8.87	Do you like living in Italy?	Strongly agree
-8.36	Law enforcement	Very reliable
-7.85	Do you like living in the town you live in?	Strongly agree
-7.60	In your opinion, how important is it to take care of your family?	Very important
-7.33	I feel I belong mostly to Italy	Definitely yes
-7.11	If you think about the future, do you feel optimistic/pessimistic?	Very optimistic
-6.84	I feel I belong mostly to my town	Definitely yes
-6.72	Health services	Quite agree
-6.71	In your opinion, how important is it to follow the rules?	Very important
-6.55	Your family is reliable/unreliable	Very reliable
-6.33	Your family is capable/incapable	Very capable
-6.16	If you think about the future, do you feel worried/confident?	Very confident
-6.06	In your opinion, in the medium term, what will be the degree of development of the town you live in? (reverse item)	Quite low
-5.98	If you think about the future, do you feel active/passive?	Very active
-5.83	In your opinion, in the medium term, what's the possibility of Italy developing?	Quite high
Disaffection		
6.22	In your opinion, how important is it to take care of your family?	Quite agree
5.91	I feel I belong mostly to Italy	Quite disagree
5.89	In the town where you live, inhabitants are respectful of the rules	Quite disagree
5.43	In your opinion, how important is it to follow the rules?	Quite disagree
5.18	I feel I belong mostly to Europe	Quite disagree
5.05	Do you like living in Italy?	Strongly disagree
5.03	I feel I belong mostly to my town	Quite disagree
4.75	Public transport	Quite unreliable
4.70	Do you like living in the town you live in?	Quite disagree
4.70	In the town where you live, inhabitants are committed to improving the collective coexistence	Quite disagree
4.64	Public job centers	Very unreliable
4.62	Do you like living in the town you live in?	Quite disagree
4.61	How satisfied are you with your current situation? (reverse item)	Rather satisfied
4.59	In your opinion, in the medium term, what's the possibility of Italy developing?	Rather low
4.56	Are your friends capable/incapable?	Quite incapable

An Exploratory Study of Gamblers' Perceptions of Music's Effects on Gambling Behaviour

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Abstract

Background music is often present in gambling environments and has been found to influence gamblers' behaviour. However, little is known about gamblers' perception of environmental influences, including music, and whether gamblers believe that such influences can impact upon their gambling behaviour. An online questionnaire was administered to 136 gamblers to probe the perceived effects of gambling operator-selected and self-selected music on the cognitive, emotional, and behavioural aspects of gambling. In general, few respondents believed that music influences aspects of gambling participation. However, the analysis indicated that some gamblers, particularly those classified as moderate-risk and problem gamblers, self-select music to accompany gambling, and analysis of free-text responses indicated that this was undertaken to match their musical preferences or out of habit. Some gamblers believed that self-selected music promoted positive moods and supported concentration. Furthermore, some poker players thought that music may serve unique functions such as helping them to mask outward emotions and filling time between games. This study demonstrates that self-selected music is sometimes purposefully used by gamblers to support the cognitive and emotional aspects of gambling. However, as few gamblers believed that music could influence the cognitive, emotional, and behavioural aspects of gambling, this research reveals a disparity between subjective opinions and objective evidence, as gathered in published empirical laboratory experiments. This indicates the need to improve gamblers' awareness of the potential influence of background music on the gambling experience.

Keywords: gambling, background music, self-selected music, musical preferences, gambling behaviour perception, beliefs

Résumé

Dans les environnements de jeu, il y a souvent une musique de fond, et on a constaté qu'elle influençait le comportement des joueurs. Cependant, on sait peu de choses de

la perception qu'ont les joueurs des influences environnementales, notamment la musique, et de leur avis quant aux influences que ces facteurs environnementaux peuvent avoir sur leur comportement de jeu. Un questionnaire en ligne a été soumis à 136 joueurs compulsifs afin de sonder les effets perçus de la musique sélectionnée et choisie par les opérateurs de jeux d'argent, d'une part, et celle choisie par le joueur, d'autre part, sur les aspects cognitifs, émotionnels et comportementaux du jeu. En général, peu de répondants interrogés pensent que la musique influence certains aspects de la participation au jeu. Toutefois, l'analyse a montré que certains joueurs, en particulier ceux classés à risque modéré et à problème, choisissaient eux-mêmes leur musique pour accompagner les jeux de hasard, et l'analyse des réponses en texte libre indiquait que cela était fait pour correspondre à leurs préférences musicales ou par habitude. Certains joueurs étaient d'avis que la musique qu'ils choisissaient eux-mêmes favorisait une humeur positive et la concentration. De plus, certains joueurs de poker étaient d'avis que la musique pouvait potentiellement servir à des fonctions particulières, comme les aider à masquer leurs émotions et à combler le temps entre les parties. Cette étude démontre que les joueurs utilisent parfois délibérément de la musique qu'ils ont eux-mêmes choisie pour soutenir les aspects cognitifs et émotionnels du jeu. Cependant, comme peu de joueurs étaient d'avis que la musique pouvait influencer les aspects cognitifs, émotionnels et comportementaux du jeu, cette recherche révèle une disparité entre les opinions subjectives et les preuves objectives recueillies dans le cadre d'expériences empiriques de laboratoire publiées. Cette étude montre qu'il est nécessaire de sensibiliser davantage les joueurs à l'influence potentielle de la musique de fond sur l'expérience de jeu.

Introduction

Gambling is a popular leisure activity: In the United Kingdom, 48% of adults participated in gambling in 2016 (Gambling Commission, 2017). Background music often features within the design of gambling activities (Bramley & Gainsbury, 2015) and environments (Bramley, Dibben, & Rowe, 2016; Griffiths & Parke, 2005), where it is used to promote and enhance the gambling experience (Bramley et al., 2016; Parke & Griffiths, 2007). Yet, gambling is a risky behaviour and requires individuals to use a range of psychological processes, including attention (Noseworthy & Finlay, 2009), judgement, decision making, and memory, all of which can be influenced by music and other environmental stimuli (North & Hargreaves, 2008). Consequently, it is important to understand the influence of music on gambling behaviour and the extent of gamblers' awareness of these potential influences on behaviour.

The potential influences of music on gambling can be considered in relation to Griffiths (1993) categorization of ways in which the gambling industry encourages gambling in terms of (a) situational characteristics and (b) structural characteristics. Situational characteristics attract gamblers to a gambling environment (e.g., the location and density of gambling outlets in an area; gambling advertising) and are

important in an individual's initial decision to gamble. Structural characteristics are features that may maintain gambling behaviour (Parke & Griffiths, 2006) and include playability (e.g., speed of play) and ambient features (e.g., design of gambling environments or activities; Parke & Griffiths, 2007).

Music can be considered both as a situational and structural characteristic. As a situational characteristic, music can be present in the background of gambling environments and can feature in gambling activities (e.g., emitted from variously called fruit, slot, or gaming machines) as a structural characteristic. Therefore, music can potentially initiate gambling participation and maintain gambling behaviour. Background music is often present within gambling environments and its presence tends to be controlled by gambling operators (Bramley et al., 2016; Bramley & Gainsbury, 2015; Griffiths & Parke, 2005). In casinos, background music is a constant presence and is often sourced through external music supply companies (Bramley et al., 2016). Casino managers use recorded background music to create the right atmosphere for gambling and to promote positive moods (Bramley et al., 2016). To achieve these aims, casino managers manipulate the tempo, volume, and genre of the recorded background music by selecting appropriate playlists (Bramley et al., 2016). Some casino managers use live music, in addition to recorded background music, but live music is usually used to accompany non-gambling activities (e.g., the consumption of food and drink in the casino's restaurants and bars), to entertain customers, and to advertise the casino (Bramley et al., 2016).

In amusement arcades, managers choose background music with the aim of appealing to their customers' preferences, basing their decisions on associations between particular music genres and the targeted age and gender of customers, as well as on matching the machine they play (Griffiths & Parke, 2005). One amusement arcade manager commented that allowing gamblers to request certain music to be played kept the customers happy and "when they are happy, they are spending" (quoted in Griffiths & Parke, 2005, p. 5). In online slot machine gambling, research suggests that background music might help to elicit emotional responses in gamblers and enhance the gambling experience (Bramley & Gainsbury, 2015). Therefore, it appears that gamblers are exposed to a great deal of music that may be perceived to influence, or in reality to influence, their gambling experience and behaviour.

Research conducted in retail and commercial environments suggests that background music can influence the speed of consumer activity, perception of the environment, patronage, purchasing, and time perception (North & Hargreaves, 2006, 2008). Griffiths and Parke (2003, 2005) applied such research to gambling and suggested that background music may increase gamblers' confidence, arousal level, and risk-taking behaviour; aid relaxation; help gamblers to disregard previous losses; mask the auditory cues emitted from the slot machines; and induce a romantic affective state, leading gamblers to believe that their chances of winning are unrealistically enhanced. Furthermore, Griffiths and Parke (2005) hypothesized that popular music may be the most potent genre in influencing slot machine gambling

because this genre can influence behaviour in other commercial environments (e.g., cafeterias, banks, and bars).

Researchers have found that music can influence indices of laboratory gambling behaviour. Mentzoni, Laberg, Brunborg, Molde, and Pallesen (2014) found that slow-tempo music led participants to place more bets and fast-tempo music led to quicker reaction times during a simulated card game. Three studies have found that fast-tempo music leads to quicker betting in virtual roulette (Bramley, Dibben & Rowe, 2014; Dixon, Trigg, & Griffiths, 2007; Spenwyn, Barrett, & Griffiths, 2010). Noseworthy and Finlay (2009) found that music, particularly slow-tempo, high-volume music, can provide cues from which slot machine players can more accurately reconstruct elapsed duration of play. Therefore, evidence suggests that music can influence gambling behaviour, although the extent to which this transfers to real-life gambling situations is currently unknown.

The experience of background music in real-life gambling situations, from the gambler's perspective, has largely been neglected. Two studies that have investigated gamblers' experiences of music focused on the gamblers' opinions of the music and sound emitted from gambling equipment (Husain, Wardle, Kenny, Balarajan, & Collins, 2013; Livingstone, Woolley, Zazryn, Bakacs, & Shami, 2008). Husain et al. (2013) found that some gamblers reported that background music helped to create an illusion of a cosy, welcoming environment. Looking beyond the gambling environment, some evidence suggests that people may not always be aware of the presence of background music, nor of its potential effects. For example, stereotypical French and German background music played in a supermarket influenced the purchasing of French and German wine, yet shoppers' questionnaire responses suggested that they were aware of the music, but unaware of music's effects on their purchasing behaviour (North, Hargreaves, & McKendrick, 1999). More research in the field of gambling studies is needed to ascertain whether gamblers are aware of music's presence and potential to influence gambling behaviour. Gamblers may hold erroneous beliefs concerning the relationship of music and gambling. If so, such beliefs might contribute to problematic gambling and be potential targets for intervention.

To date, researchers have limited their investigations about how music may influence indices of gambling behaviour to experimenter-selected and gambling operator-selected music. However, research suggests that some casino and remote gamblers listen to music of their own choice (i.e., self-selected music; Bramley et al., 2016; Parke, Parke, Rigbye, Suhonen, & Vaughan Williams, 2012). Casino managers have observed gamblers listening to music via portable music players when playing poker and slot machines (Bramley et al., 2016). Furthermore, in a survey of online gamblers, "doing something simultaneously," such as "playing whilst listening to your own choice of music," was reported as an appealing feature of Internet gambling (Parke et al., 2012, p. 149). To date, self-selected music listening while gambling has not been widely acknowledged, which is somewhat surprising given the plethora of activities in everyday life that music can accompany and that have previously been

remarked on: housework, running, cycling, desk work, trying to get to sleep (Sloboda, 1999), driving (Dibben & Williamson, 2007; Sloboda, 1999), travelling (Heye & Lamont, 2010), and working (Haake, 2011).

As studies in these other domains indicate, self-selected music can serve a number of functions: provide enjoyment (Heye & Lamont, 2010; North, Hargreaves, & Hargreaves, J.J., 2004); pass time (Heye & Lamont, 2010; North et al., 2004); create the right atmosphere (North et al., 2004); create or accentuate an emotion (Heye & Lamont, 2010; North et al., 2004); regulate arousal and mood (Schäfer, Sedlmeier, Städtler, & Huron, 2013); aid concentration (Dibben & Williamson, 2007; North et al., 2004); and help achieve self-awareness (Schäfer et al., 2013), solace (Randall & Rickard, 2017), and relaxation (Dibben & Williamson, 2007). Such “functional niches” (Sloboda, Lamont, & Greasley, 2009) for music listening provide insights into how music might operate in a gambling context. Bull (2005, 2006) suggests that individuals who personalize and control their music listening can create an “auditory bubble” in which they obtain a sense of space and manage their experiences and interactions in public and private domains. Hence, one might expect individuals to report listening to music via headphones when gambling in a public place (e.g., in a casino) or when gambling alone (e.g., online gambling). Research suggests that individuals use music in precise ways that are tailored to their personal needs (Herbert, 2013); because there are behavioural, cognitive, and emotional aspects of gambling (Orford, 2011), it may be that gamblers use music to support psychological processes associated with gambling. Furthermore, the reciprocal feedback model of musical response (Hargreaves, MacDonald, & Miell, 2005) proposes that people’s responses to music are determined by three broad classes of variables: those that relate to the listener, those that relate to the music, and those that relate to the listening situation. Each exerts a simultaneous influence on the other two variables. All of this may play a part in how gamblers respond to music heard in gambling environments, any perceived or actual influence on gambling behaviour, and which music gamblers and gambling operators select to accompany gambling participation.

This discussion of the current state of knowledge about gamblers’ perceptions of background music in real gambling environments reveals a lack of data regarding how gamblers experience music and, indeed, little acknowledgement that gamblers might listen to self-selected music. This is important to investigate, as gamblers may opt out of listening to the music provided by gambling operators and listen to their own choice of music, given that recorded music is widely available (e.g., via streaming services) and accessible due to the miniaturization of portable music-listening devices. However, it is currently unknown which functions that self-selected music might serve for gamblers and the potential impact of their choices on their gambling experience. The present exploratory study had two aims. The first was to probe gamblers’ beliefs about whether gambling operator-selected music heard in gambling environments influences the cognitive, emotional, and behavioural aspects of gambling. The second was to establish why gamblers listen to self-selected music and to examine their beliefs about whether this type of music influences the cognitive, emotional, and behavioural aspects of gambling.

Method

Participants

An e-mail was sent to a list of staff and students who were interested in volunteering to participate in research studies at The University of Sheffield, Sheffield, UK. The e-mail informed potential respondents about the study and invited individuals to complete an online questionnaire about music and gambling via a link. Inclusion criteria were that participants should be at least 18 years of age and have gambled in the last 12 months.

Materials & Procedure

The questionnaire consisted of 19 questions with varying response formats: forced-choice, quantitative ratings, and open-ended responses. None of the questions were mandatory and the use of skip logic ensured that participants answered only those questions that reflected their gambling participation and music-listening habits.

The first section collected demographic information (age, gender, marital status, employment status, and income) and asked respondents about their gambling habits (i.e., which activities they played, how often they played, and their expenditure) in land-based gambling environments and when gambling remotely. The second section collected information about gamblers' opinions of gambling operator-selected music by using responses to 11 statements compiled from the hypothesized and actual effects of music on behaviour as identified in previous research (Table 1).

In Table 1, the statements are grouped according to the three aspects of gambling identified by Orford (2011): behavioural, cognitive, and emotional. These statements were used to examine the possible functions and influences of gambling-operator music heard in traditional and remote gambling environments, as well as of self-selected music. The respondents rated their agreement with the statements on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The third section collected information about self-selected music and included questions about how participants listened, how often they listened, which music genres they listened to, their motivations for listening (via free-text responses), and their opinions about self-selected music (by responding to 11 statements).

Finally, respondents completed the PGSI (Ferris & Wynne, 2001). The PGSI focuses on the harms and consequences associated with gambling, such as chasing losses, needing to gamble with larger amounts of money to experience the same level of excitement, and experiencing financial difficulties (Ferris & Wynne, 2001). The PGSI score consists of the sum of nine questions (e.g., "Thinking about the last 12 months, have you bet more than you could really afford to lose?") answered as "never" (0), "sometimes" (1), "most of the time" (2), or "almost always" (3). Higher scores indicate greater risk of problem gambling. Scores obtained for each question were

Table 1

Statements Probing Respondents' Beliefs About Music Heard When Gambling, With References to Where Actual or Hypothesized Effects of Music on Gambling Behaviour Were Suggested in Previous Research

Statement	Aspect of gambling	Relevant literature source
"attracts me to a particular area, website, or game"	Cognitive/Emotional	Griffiths & Parke (2005)
"is distracting"	Cognitive	Bramley (2015)
"aids my concentration"	Cognitive	Dixon et al. (2007)
"affects my ability to judge the amount of time that I have spent gambling"	Cognitive	Noseworthy & Finlay (2009)
"creates the right atmosphere"	Emotional	Bramley (2015) Mayer & Johnson (2003)
"makes me gamble for a longer period of time"	Behavioural	Griffiths & Parke (2005)
"makes me gamble for a shorter period of time"	Behavioural	Griffiths & Parke (2005)
"makes me place bets at a faster rate"	Behavioural	Bramley et al. (2014); Dixon et al. (2007); Spenwyn et al. (2010)
"makes me place bets at a slower rate"	Behavioural	Bramley et al. (2014); Dixon et al. (2007); Spenwyn et al. (2010)
"makes me bet larger amounts of money"	Behavioural	Griffiths & Parke (2005)
"makes me bet smaller amounts of money"	Behavioural	Griffiths & Parke (2005)

totalled to provide participants' problem gambling status (0 = non-problem gambler; 1–2 = low-risk gambler; 3–7 = moderate-risk gambler; 8+ = problem gambler).

Respondents were then thanked for participating and provided with a list of organizations to contact should they wish to discuss their gambling habits. The entire questionnaire took approximately 15 min to complete.

Ethics approval was granted by The University of Sheffield Research Ethics Committee. Informed consent was obtained at the beginning of the online questionnaire.

Data Analysis

We analysed quantitative data with SPSS in order to perform descriptive and inferential statistical tests. Responses to the open-ended questions were analysed with thematic analysis (Braun & Clarke, 2006), which enables researchers to scrutinize data in detail by identifying, analysing, and reporting themes (patterns) within it (Braun & Clarke, 2006). We used the five phases of thematic analysis: (1) becoming familiar with the data (the research team repeatedly read the responses), (2) generating initial codes, (3) searching for themes, (4) reviewing themes, and (5) defining and naming themes (Braun & Clarke, 2006).

Results

Sample characteristics

A convenience sample of 136 respondents (79 male; 57 female; $M = 28$ years; $SD = 10.46$; age range: 18–58 years) completed the questionnaire. The respondents were most commonly single (66.2%), in full-time education (58.8%), and earning up to £10,399 (47.1%) per annum. The majority of respondents ($n = 67$; 49.3%) were classified as land-based gamblers (i.e., people who gamble in physical environments such as casinos, bookmakers, live sporting events, amusement arcades, etc.), 59 (43.4%) as mixed gamblers (i.e., land-based and remote gamblers), and 10 (7.3%) as remote gamblers (i.e., people who gamble via the Internet, television, smartphones, tablets, or any other kind of electronic or technological device). A chi-square analysis with post hoc Z-tests revealed a significantly higher proportion of females in the land-based group (56.7%) and a significantly higher proportion of males in the mixed group (74.6%), $\chi^2(2) = 12.64$, $p < .05$.

Table 2 shows that the National Lottery was the most popular gambling activity, followed by betting and private betting. The previous month expenditure on these gambling activities was most commonly “less than £10.00.” The number of gambling activities that respondents reported engaging in provided an indication of gambling involvement. On average, respondents participated in 4.6 gambling activities in the past year ($SD = 2.66$; range: 1–13).

Of the sample, 40 respondents were classified as non-problem gamblers (22 male), 41 as low-risk gamblers (21 male), 29 as moderate-risk gamblers (19 male), and one male as a problem gambler on the basis of their Problem Gambling Severity Index

Table 2
Gambling participation by activity (top 10 activities)

Gambling activities	<i>N</i>
National Lottery	90
Betting	83
Private betting	58
Scratch cards	48
Slot/fruit machines	47
Table games (roulette, cards, or dice games played in a casino)	43
Virtual gaming machines (electronic machines that offer gamblers the opportunity to play games such as roulette, blackjack, poker, keno, or bingo in a land-based gambling environment)	29
Another form of gambling (used to allow respondents to document a form of gambling that they participated in such as peer gambling, or for respondents who may not have understood the descriptions of the gambling activities)	26
Football pools	12
Betting exchange	12

^a Multiple responses to this question were permitted.

(PGSI) scores (Ferris & Wynne, 2001). Twenty-four respondents did not complete the PGSI. For analysis purposes, the classifications “non-problem gambler” and “low-risk gambler” were collapsed into one category named “non-problem or low-risk gamblers.” Similarly, those classified as either “moderate-risk gambler” or “problem gambler” were organized into a single category named “moderate-risk or problem gamblers.” A chi-square analysis found no relationship between gender and PGSI classification, $\chi^2(3) = 2.23, p = .526$. Moderate-risk or problem gamblers ($M = 7, SD = 2.75$) were significantly more involved with gambling, $F(1, 105) = 21.50, p < .001$, as they participated in a greater number of gambling activities than did non-problem or low-risk gamblers ($M = 4.51, SD = 2.33$).

Experiences of Gambling Operator-Selected Music in Land-Based Gambling Environments

Over half of the respondents ($n = 69$; 50.7%) reported that they had heard music in a land-based gambling environment within the last 12 months.

Responses to the statements in relation to gambling operator-selected music are summarized in Table 3. Only one item (“creates the right atmosphere”) was positively endorsed by over half the sample. For Items 2 to 8, the majority of responses were “neither agree nor disagree” and therefore showed a degree of uncertainty about whether gambling operator-selected music was attractive, was perceived to extend the duration of gambling sessions, influenced gamblers’ betting speed or time perception abilities, influenced the duration of gambling sessions, or hindered or

Table 3

Responses to the Statements in Relation to Gambling Operator-Selected Music Heard in Land-Based Gambling Environments in Terms of Percentage Agreement, Mean Rating, and Standard Deviation of Each Statement

Statement ^a	% Agree or strongly agree ^b	<i>M</i>	<i>SD</i>
1 ...creates the right atmosphere	59.7	3.6	.80
2 ...attracts me to a particular area, website, or game	35.5	3.0	1.06
3 ...is distracting	30.6	2.9	1.00
4 ...makes me gamble for a longer period of time	27.4	2.9	.97
5 ...affects my ability to judge the amount of time that I have spent gambling	16.1	2.8	.86
6 ...makes me place bets at a faster rate	14.5	2.9	.67
7 ...aids my concentration	11.3	2.7	.90
8 ...makes me gamble for a shorter period of time	3.2	2.4	.75
9 ...makes me bet larger amounts of money	3.2	2.3	.81
10 ...makes me place bets at a slower rate	0	2.6	.61
11 ...makes me bet smaller amounts of money	0	2.3	.72

Note. $n = 62$.

^a Each statement began, “The music I hear when gambling in a land-based gambling environment...”

^b 1 = *strongly disagree*; 5 = *strongly agree*.

aided gamblers' focus. Regarding Items 9 to 11, the majority of responses disagreed with the statements, suggesting that respondents did not consider gambling operator-selected music to affect their speed of betting or their expenditure.

Experiences of Self-Selected Music

Over a third of respondents ($n = 52$; 38.2%) self-selected music to accompany gambling. The majority of the respondents who self-selected music were mixed gamblers ($n = 34$; 65.4%), followed by remote ($n = 10$; 19.2%) and land-based gamblers ($n = 8$; 15.4%).

Background variables associated with listening to self-selected music. Statistical analyses were performed to explore whether choosing music to accompany gambling was associated with age, gender, or PGSI classification. An independent t test showed that age significantly influenced whether respondents self-selected music, $t(123.95) = 4.27$, $p < .001$ (equal variances not assumed), $r = .75$. Those who self-selected music were younger ($M = 24.5$ years, $SD = 7.76$) than those who did not ($M = 31.6$ years, $SD = 10.85$).

A chi-square analysis found a significant association between gender and whether individuals listened to music of their own choice, $\chi^2(1) = 8.33$, $p < .05$. The odds ratio showed that males were 3.03 times more likely than females to listen to music of their own choice when gambling.

Just under half ($n = 25$; 48.1%) of the individuals who self-selected music were classified as non-problem or low-risk gamblers and over a third ($n = 19$; 36.5%) were classified as moderate-risk or problem gamblers (eight respondents who self-selected music did not complete the PGSI). A chi-square analysis revealed a significant association between PGSI classification and respondents who listened to music of their own choice, $\chi^2(1) = 10.80$, $p < .001$. Moderate-risk or problem gamblers were 4.1 times more likely to self-select music than were non-problem or low-risk gamblers.

Mode of listening and genres listened to while gambling. The most popular device used to facilitate music listening was a hi-fi or computer ($n = 38$ responses; 73.1%), followed by a portable music player such as an MP3 or CD player or a smartphone ($n = 23$ responses; 44.2%) and then the radio ($n = 6$ responses; 11.5%). The respondents indicated which genres of music they chose to listen to while gambling from a list of 15 categories. The most popular genre listened to was alternative/Indie ($n = 24$ responses; 14.8%) followed by rock ($n = 23$ responses; 14.2%), pop ($n = 23$ responses; 14.2%), dance/electronic/house ($n = 20$ responses; 12.3%), heavy metal ($n = 13$ responses; 8%), rap/hip-hop/RnB ($n = 12$ responses; 7.4%), blues ($n = 10$ responses; 6.2%), folk ($n = 9$ responses; 5.6%), classical ($n = 7$ responses; 4.3%), jazz ($n = 7$ responses; 4.3%), soul/funk ($n = 6$ responses; 3.7%), soundtracks ($n = 5$ responses; 3.1%), other ($n = 2$ responses; 2.5%), and religious music ($n = 1$ response; 0.6%).

Table 4

Responses to the Statements in Relation to Self-Selected Music Experienced When Gambling in Land-Based or Remote Gambling Environments in Terms of Percentage Agreement, Mean Rating, and Standard Deviation of Each Statement

Statement ^a	% Agree or strongly agree ^b	<i>M</i>	<i>SD</i>
1 ...creates the right atmosphere	67.4	3.8	.97
2 ...makes me gamble for a longer period of time	37.2	3.2	.90
3 ... aids my concentration	37.2	3.1	.91
4 ...affects my ability to judge the amount of time that I have spent gambling	30.2	2.8	1.10
5 ...is distracting	14.0	2.4	.93
6 ...makes me place bets at a faster rate	9.3	2.6	.76
7 ...makes me bet larger amounts of money	7.0	2.5	.70
8 ...makes me place bets at a slower rate	4.7	2.4	.70
9 ...makes me bet smaller amounts of money	0	2.3	.61
10 ...makes me gamble for a shorter period of time	0	2.3	.64

Note. *N* = 43.

^a Each statement began, "The music that I choose to listen to when gambling..." The statement "attracts me to a particular area, game/website or machine" was omitted for self-selected music.

^b 1 = *strongly disagree*; 5 = *strongly agree*.

Opinions towards self-selected music. Gamblers' beliefs about self-selected music are summarized in Table 4. Only one item ("creates the right atmosphere") was positively endorsed by two-thirds of respondents. Over a third of respondents positively endorsed the item "aids my concentration" and the same proportion positively endorsed the item "makes me gamble for a longer period of time." For the remaining items, the majority of responses were "strongly disagree" or "disagree," showing that participants disagreed that self-selected music influenced their ability to judge time, influenced their betting speed, shortened the duration of gambling sessions, or affected their expenditure. Over 50% of respondents disagreed that self-selected music was distracting.

Motivations for listening to self-selected music. The gamblers' free-text responses (*n* = 48) to the question, "Why do you listen to music of your own choice when gambling?" were coded by using thematic analysis (Braun & Clarke, 2006) because it offered flexibility through its theoretical freedom and allowed data to be described in detail by identifying, analysing, and reporting themes (patterns; Braun & Clarke, 2006). The level of detail obtained in response to the question ranged from one word to a brief paragraph (circa. 100 words). The responses highlighted that some (39.6%) but not the majority of gamblers who listen to self-selected music consider this type of music to influence aspects of their gambling participation. Four themes emerged from the thematic analysis, as follows.

Musical preferences influence music listening. Musical preferences were referred to by 37.5% (*n* = 18) of respondents who self-selected music to accompany their

gambling as a factor that led them to self-select music. Some respondents listened to their own music because they disliked the music played by gambling operators: *"Because I enjoy my own music rather than cheesy 'poker music'"; "I can listen to songs with words rather than annoying sounds"; "I like my music not that rubbish that comes over the sound system"; "Relaxing, enjoyable, better than the sites' own annoying music."* Some gamblers were dissatisfied with the gambling operators' music, as it was deemed to be of poor quality. The type of music gamblers chose to listen to was informed by their personal musical preferences: *"Because I prefer my own music"; "cos Lady Gaga isn't played by the betting websites."* It was also informed by which gambling activity they were playing: *"Varies depending on what I'm gambling on. Poker is usually more heavy music than roulette, for example."*

Listening to music promotes appropriate moods. Over a quarter of respondents ($n = 13$; 27.1%) who self-selected music to accompany their gambling behaviour made reference to self-selected music promoting appropriate moods while gambling. Six individuals reported that self-selected music created an appropriate atmosphere for gambling: *"Creates a better atmosphere"; "makes a more comfortable environment"; "Sets comfortable/relaxing atmosphere when with friends"; "Creates the right sort of atmosphere"; "I like music whether gambling or not but sometimes music can set a good tone at a poker game for example."* Self-selected music was therefore valued because it could help to convey positive affective states (e.g., comfort, relaxing, calmness) in gambling situations.

Three respondents reported listening to self-selected music in order to manage their inner feelings when gambling: *"It calms down my nerves."* Self-selected music could also help to relieve tension: *"In a social context (poker with friends) it provides a bit of entertainment and helps fill in the pauses. It also takes the tension off of the situation – without music the game would get far too serious and then it's just not fun."* In addition, one respondent listened to music via a portable music player with the aim of masking his outward feelings while gambling: *"Allows me to feel comfortable in the surrounding environment, mainly for poker so it is harder for people to read you."*

Habitual music listening. For 22.9% of respondents ($n = 11$) who self-selected music to accompany their gambling, they did so habitually with gambling for two reasons. The first was because music listening was a part of their everyday life: *"I listen to music all the time"; "I always listen to music"; "I like music whether gambling or not"; "I always have music on."* The second was because self-selected music frequently accompanied their computer usage, which could encompass online gambling: *"...mostly when gambling online it's simply just listening to music. I can't really do anything especially online without listening to some sort of music"; "...It's all part of the computer experience. When I am on the computer, unless I am writing, I listen to music...The computer experience is not that interesting in itself, so to enhance the process of internet access, I listen to music. The music listening is not linked to the gambling. It's linked to the computer"; "Music plays when I gamble remotely as I just tend to have music on when I'm at the computer"; "I listen to music generally when on the computer and so gambling falls into this."*

Listening to music provides cognitive effects. A small number of respondents ($n = 6$; 12.5%) who listened to self-selected music did so because they thought that it supported the cognitive aspects of gambling. Three respondents reported that music helped them to concentrate: *“Just to have something to listen to in the background, if I’m in a big tourney online that’s gonna last a few hours it helps me stay awake and focused to a certain extent.”*

Four respondents remarked that self-selected music could divert their attention from monitoring the passage of time when waiting, either to find out whether they had won or lost, or for one of their competitors to gamble: *“To fill in the time while waiting to see if I’ve won”*; *“online poker is a very slow and dull process especially in a high stakes game. Music fills in the gaps.”* Self-selected music could also provide a positive distraction: *“When playing poker online I like to listen to my own music because it makes the game more enjoyable and helps me detach myself slightly from the game which I find to be beneficial to my game and when the game is going slowly because there is a player that likes to take their time...it provides a welcome distraction.”*

Discussion

This study is the first to examine gamblers’ beliefs about gambling operator-selected and self-selected music and associated behaviours. The results indicate that both gambling operator-selected and self-selected music are considered to create the right atmosphere for gambling. However, in general, there was not a strong recognition of a number of effects that have been demonstrated in the literature, therefore suggesting a possible disparity between the aspects of gambling that gamblers believe music can influence and objective evidence obtained in empirical experiments.

The results of laboratory studies suggest that musical characteristics can influence betting speed (Bramley et al., 2014; Dixon et al., 2007; Spenwyn et al., 2010), reaction time (Mentzoni et al., 2014), and estimations of duration of play (Noseworthy & Finlay, 2009). However, responses to the statements in relation to both gambling operator-selected and self-selected music showed that, in general, gamblers do not believe that music influences their gambling behaviour (i.e., betting speed, the ability to judge the time spent gambling, expenditure, and duration of gambling sessions). There are at least three possible explanations here. First, it may be that the processes associated with gambling have become more automatic. Relative to controlled processes, automatic processes are fast, demand fewer attentional resources, and can occur with little awareness (Sternberg, 2009). From this, it may be that gamblers are unaware of environmental stimuli such as music exerting an influence on their gambling participation. Second, socially desirable reporting may have had an impact on our study: Individuals may have been reluctant to disclose that aspects of their gambling participation can be influenced by music because of their desire to portray themselves favourably and their belief that they are in control of their gambling. Third, effects of music (e.g., influences of tempo on betting speed; Bramley et al., 2014) only occur when playing particular games (e.g., roulette) that involve gamblers

participating in regular cycles of betting (roulette) or gambling over a prolonged period (e.g., poker). Music is unlikely to influence discontinuous gambling activities such as the National Lottery, which was the most popular form of gambling that this sample participated in. This is because individuals buy tickets and then wait a potentially prolonged period of time for the draw to take place before they know whether they have won or lost.

Regarding self-selected music, this study provides direct evidence to support the notion that some individuals self-select music to accompany their gambling (Parke et al., 2012). Of those who self-selected music, the free-text responses revealed that over 60% chose music to match their musical preferences or out of habit. The remaining respondents believed that music could support either the cognitive or emotional aspects of gambling. Similar to other studies that have investigated the use of music by drivers (Dibben & Williamson, 2007) and athletes (Laukka & Quick, 2013), it appears that some gamblers also use music in purposeful ways to enhance their gambling experience. Self-selected music fulfilled a range of functions for gamblers, including promoting positive affective states (e.g., comfort, relaxation, calmness, easing tension), maintaining arousal levels, diverting attention, aiding concentration, and filling time. Such functions are also common uses of music in other everyday situations (North et al., 2004; Schäfer et al., 2013). However, it is important to note that although some gamblers reported that self-selected music can support certain cognitive and emotional aspects of gambling, this was not the view of the majority.

The analysis of gamblers' free-text responses concerning their motivations for self-selected music listening provided insights into additional functions served by this type of music that were not captured by the statements. Two unique functions were reported by a gambler who played poker in a social setting. First, the gambler used music to detach from the context. Bull (2006) discussed how portable music players could provide an "auditory bubble" for the user, and in poker it may be that self-selected music provides a positive distraction by capturing attention. This particular use of music may be important because of the concept of "tilting": when negative emotions elicited by monetary losses lead gamblers to make detrimental and out-of-control decisions (Browne, 1989; Palomäki, Laakasuo, & Salmela, 2013). Gamblers who focus their attention on self-selected music when "on tilt" may experience a change in emotion that reduces any tension or frustration induced during the gambling session. Using music in this manner relates to previous research that found that individuals report using music to seek detachment from the self, activities, and their surroundings (Herbert, 2013).

Second, this gambler reported using music to manage mood and thereby control outward emotions portrayed in body language that might otherwise have allowed opponents to determine the strength or weakness of the gambler's poker hand. Therefore, for this participant, music was one component of maintaining a "poker face" (van Ingen, 2008). Using music to manage outward feelings is akin to two dimensions of mobile listening proposed by Bull (2006); this gambler used music with

a moral dimension—to avoid relating to others—as well as with a cognitive dimension in an attempt to manage his moods and thoughts.

Poker was mentioned by five other gamblers when explaining why they self-select music and indicated that this type of music serves different functions depending on whether the gamblers play poker online or offline. These differences seem related to the different characteristics of online versus in situ gambling. In online poker, players typically gamble alone in a virtual social setting such that players cannot see each other (Gainsbury, 2010, 2012). The speed of play in online poker may be quicker than in offline poker because actions, including shuffling and dealing cards, are automated. Consequently, gamblers may be able to play more hands and play several tables at once (Fiedler & Rock, 2009). In this study, online poker players tended to use music to enhance their enjoyment, help them to detach from the game, provide a positive distraction during slower periods of play, and fill in the gaps during play. In such examples, it appeared that self-selected music shifted to the foreground from the background and was listened to attentively. By contrast, offline (in situ) poker is characterized by individuals playing against each other face to face. Therefore, offline poker players used music to manage the social setting in which the poker took place. Music was used in social poker gambling situations to provide entertainment, ease tension, and help gamblers to feel comfortable; one respondent reported using music to mask outward emotions. This study therefore illustrates how gamblers' use of music can relate to the characteristics of specific gambling activities and situations.

Our study also showed that individuals classified as moderate-risk or problem gamblers were more likely to self-select music. Three possible explanations are proposed to explain this finding. First, it may be that for moderate-risk or problem gamblers, self-selecting music allows them to exert control over their gambling environment, as this type of music is more likely to be predictable, familiar, and less distracting. Therefore, it may support the cognitive work that is required to make decisions during gambling sessions. Second, it may be that for moderate-risk or problem gamblers, self-selecting music is, or forms part of, a superstitious belief. Gamblers may believe that certain musical pieces are “lucky” and listen to them while gambling, an idea supported by evidence that problem gamblers hold more superstitious beliefs than non-problem gamblers do (Joukhador, Blaszczynski, & Maccallum, 2004). Third, as moderate-risk or problem gamblers may participate in gambling more frequently or for longer durations than do non-problem or low-risk gamblers, it may be more worthwhile for the former to invest time into selecting appropriate music to accompany their gambling. These hypotheses require further testing in future research.

The results from this survey study provide new insights into background music while gambling. However, three limitations should be considered. First, the overall completion rate (percentage of returned questionnaires that were completely answered) was 79.2%. Questions located towards the end of the questionnaire, for example, the PGSI, were unanswered by some respondents, which limited the ability

to probe associations between PGSI classification and motivations for listening to self-selected music. Second, the questionnaire relied on retrospective recall of which particular gambling activities individuals were engaged in while listening to music. Future research could ask participants to recall the last time that they heard music when gambling in order to examine whether certain gambling activities are more likely to be accompanied by music. Furthermore, future research could use alternative methodologies, such as the experience sampling method, in order to reduce the delay between gambling while listening to music and reporting on the gambling experience. Third, the low sample sizes ($n < 100$) meant that more sophisticated statistical analyses (e.g., factor analysis) could not be performed on the data.

Despite these limitations, the study provides exploratory findings into the music-listening habits of gamblers. Gamblers reported hearing music in land-based gambling environments (other research has suggested that music is present in gambling environments, but it was unknown whether gamblers pay attention to the music; Bramley et al., 2016) and some gamblers self-selected music, a music-listening practice that up to now has not been widely recognized in academic research investigating music and gambling. Notably, analysis of responses to the statements showed that gamblers disagree that music can influence the cognitive, emotional, and behavioural aspects of gambling despite empirical evidence to the contrary. Our study suggests that a gap exists between subjective opinion and objective evidence: Gamblers are seemingly not aware of music's potential to influence the gambling experience. This is an important finding, given that music is often incorporated into the design of gambling products and environments (Bramley et al., 2016; Bramley & Gainsbury 2015) and that music, together with other structural characteristics, is thought to be partly responsible for the development of gambling problems (Orford, 2011). This study therefore provides context for more in-depth research into this topic, such as investigating the relationships between the music experienced in gambling environments; individuals' choices concerning the music they listen to; gamblers' perceptions, experiences, and behaviours; and the gambling situation itself so as to inform the design of the gambling environment and equipment.

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Savoir plus, miser moins : une maîtrise des principaux concepts en statistiques et probabilités distingue-t-elle les comportements de jeu?

Know more, bet less: Does a mastery of the principles of statistics and probabilities distinguish between gambling behaviours?

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Résumé

La recherche en prévention et en traitement du jeu d'argent pathologique suppose que la connaissance des statistiques et des probabilités (SP) améliore les prises de décision menant à la participation à des jeux de hasard et d'argent (JHA). Il est dès lors attendu que les gens maîtrisant les notions de SP soient davantage protégés des excès au jeu. Or, des études réalisées en laboratoire rapportent de plus longues durées de jeu et des comportements de jeu défiant une bonne compréhension des SP parmi cette population, similaires à ceux qui n'ont pas ces connaissances. Est-ce que ces comportements se reflètent dans les habitudes de jeu des personnes maîtrisant les SP, lorsqu'elles choisissent de jouer dans leur vie personnelle? Soixante-quatorze universitaires répartis en deux groupes selon leur maîtrise des SP ont été sondés sur leurs comportements et problèmes de jeu. Les résultats montrent que les participants jouent peu et éprouvent peu de problèmes de jeu, qu'ils possèdent les connaissances en SP ou non. L'apport modéré de la connaissance des SP sur les comportements de jeu auprès d'une population universitaire déjà fortement scolarisée, ainsi que l'effet d'autres variables pouvant aider à discriminer les individus quant à leur maîtrise des SP et leurs comportements de jeu sont discutés dans cette étude.

Mots-clés/Keywords: jeux de hasard et d'argent, statistiques, probabilités, connaissances, comportements, universitaires / gambling, statistics, probabilities, knowledge, behaviours, university students

Abstract

Prevention and treatment research for pathological gambling suggests that knowledge of statistics and probabilities (SP) improves decisions related to gambling.

As such, it is expected that people who understand SP concepts will be more protected from excessive gambling. Laboratory studies nevertheless reveal longer gambling times and behaviours that defy a good understanding of SP in this population, similar to the behaviours of people without this knowledge. Are these behaviours reflected in the gambling habits of people with knowledge of SP when they choose to gamble in their personal lives? Seventy-four university students, divided into two groups based on their knowledge of SP, were questioned about their gambling behaviours and problems. The results show that the participants gamble very little and have few gambling problems, whether or not they have SP knowledge. The paper discusses the modest contribution of SP knowledge to gambling behaviour in the university population and the effect of other variables that could help discriminate between individuals in terms of their knowledge of SP and their gambling behaviours.

Les programmes de prévention et le traitement du jeu d'argent pathologique misent sur les concepts de statistiques et de probabilités (SP) pour faciliter la compréhension des mécanismes impliqués dans les jeux de hasard et d'argent (JHA). L'espérance de gains aux JHA étant négative à long terme, la décision optimale à prendre à l'égard de ces jeux consisterait à ne pas jouer ou alors à ne jouer qu'occasionnellement et uniquement de petites sommes d'argent (Lane, 2015). Ainsi, les personnes connaissant les SP, les notions de hasard et d'indépendance des tours par exemple, devraient être aptes à prendre de meilleures décisions et à adopter les comportements de jeu les moins problématiques.

Une meilleure capacité décisionnelle peut s'acquérir notamment par la poursuite d'études supérieures. Il a d'ailleurs été démontré que des connaissances générales supérieures, mesurées par le niveau d'éducation des individus corrélaient positivement avec de meilleures méthodes de prises de décision (Davis et coll., 2008), probablement en raison du fait que des études universitaires forment éduquent à recourir davantage à des sources fiables et à des informations scientifiquement démontrées (Evans, Kemish, & Turnbull, 2004). Par ailleurs, les pauvres résultats académiques ou un faible niveau de scolarité se retrouvent parmi les facteurs de risque sociodémographiques avérés du jeu d'argent pathologique recensés dans deux revues systématiques de la littérature (Dowling et coll., 2017; Johansson, Grant, Kim, Odlaug, & Götestam, 2009), soutenant ainsi la part des connaissances dans le développement des habitudes de jeu.

Des questions demeurent tout de même quant au lien entre le niveau d'éducation et les comportements de jeu. Par exemple, bien qu'un peu plus de six Québécois sur dix auraient joué à des JHA en 2012 (66,6 %; Kairouz & Nadeau, 2014), on retrouve significativement plus de joueurs parmi les personnes ayant terminé des études

secondaires (70,2 %) ou collégiales (70,2 %; Kairouz & Nadeau, 2014). Par contre, selon la plus récente étude de prévalence québécoise, le taux de prévalence cumulé des joueurs à risque modéré et des joueurs pathologiques probables parmi les joueurs courants a été de 4,7 % pour les individus n'ayant pas terminé leurs études secondaires, mais de tout au plus 2,7 % chez ceux détenant un diplôme d'études secondaires ou supérieures (Kairouz & Nadeau, 2014). Il semble alors que davantage de personnes éduquées soient attirées vers le jeu, mais que lorsqu'elles jouent, elles le fassent de manière moins problématique. Cependant, les études antérieures n'apportent pas de précision quant aux connaissances en SP de leurs participants. De plus, elles ont omis d'analyser leur fréquence de jeu et les montants misés au jeu, deux variables qui sont associées positivement à la gravité des problèmes de jeu (Kairouz & Nadeau, 2014).

Le niveau d'éducation semble associé également au type de jeu joué. Ce sont les personnes n'ayant pas reçu plus qu'un diplôme d'études secondaires qui composent la majorité des joueurs de loteries instantanées (55,7 %) et de bingo (68,3 %), c'est-à-dire des JHA de hasard pur, sans composante d'habileté (Chevalier, Hamel, Ladouceur, Jacques, & Sévigny, 2004). Inversement, les joueurs les plus éduqués sont également plus nombreux à se tourner vers les JHA à composante d'habileté (Bjerg, 2010; Chevalier et coll., 2004; Kairouz & Nadeau, 2014), tels les loteries sportives et les paris sportifs, les courses hippiques, les paris sur des jeux de cartes ou des jeux d'adresse, de même que les transactions boursières répétées à court terme et à haut risque (Bjerg, 2010; Mouneyrac et coll., 2017).

Bien que reposant essentiellement sur le hasard, l'issue de ces jeux favorisés par les personnes plus instruites comprend aussi une part d'habileté (Cantinotti, Ladouceur, & Jacques, 2004; DeDonno & Detterman, 2008), ce qui rend possible l'utilisation des connaissances, dont celles en SP, pour améliorer les chances de gains de ses participants (Odlaug, Marsh, Kim, & Grant, 2011). Néanmoins, ces jeux sont considérés comme étant plus risqués que la plupart des jeux sans composante d'habileté (Barrault & Varescon, 2012; Sévigny & Giroux, 2016). À cet effet, Barrault et Varescon (2012) soulignent que les caractéristiques de ces jeux induisent davantage de distorsions cognitives en donnant l'impression qu'il est possible de contrôler leurs résultats et donc, selon la théorie sociocognitive du jeu (voir Ladouceur & Walker, 1996), une hausse des comportements de jeu (Fortune & Goodie, 2012; Goodie & Fortune, 2013; Yakovenko et coll., 2016).

Le poker se retrouve parmi les JHA à composante stratégique pour lequel les connaissances en SP peuvent jouer un rôle important. Les joueurs de poker les plus habiles prendront entre autres leurs décisions de jeu en dégagant des prévisions en fonction des calculs des probabilités (Brochu, Sévigny, & Giroux, 2015), dans le but de connaître la fréquence de sortie de différentes combinaisons de cartes (Chen & Ankenman, 2013). Ces décisions auront évidemment des répercussions sur le résultat de la partie, malgré que des cartes soient distribuées aléatoirement et puissent déjouer toutes prévisions, aussi valables soient-elles (Brochu et coll., 2015). Le poker attirerait une clientèle plus scolarisée en moyenne

que les autres JHA (Bjerg, 2010), mais compterait parmi ses adeptes une proportion élevée de joueurs à risque modéré ou pathologiques probables, soit 7,9 %. Bien que ce taux soit plus important encore parmi les joueurs d'appareils de loterie vidéo (ALV) (16,4 %), il n'en demeure pas moins qu'il soit près de trois fois supérieur à celui de l'ensemble de la population de joueurs québécois (2,7 %; Kairouz & Nadeau, 2014).

La relation entre les cognitions et comportements liés au jeu et les connaissances des SP a, quant à elle, été étudiée à quelques reprises. D'abord, des études de prévention, réalisées en laboratoire pendant des séances de jeu durant lesquelles des chercheurs ont fait apparaître des messages éducatifs en lien avec les SP des JHA sur des écrans de jeu, ont révélé que ces informations diminuaient le nombre et la force des pensées erronées liées aux JHA, tant auprès de joueurs occasionnels (Benhsain, Taillefer, & Ladouceur, 2004) qu'auprès d'étudiants universitaires (Cloutier, Ladouceur, & Sévigny, 2006; Steenbergh, Whelan, Meyers, May, & Floyd, 2004). Toutefois, hormis les effets cognitifs, la littérature scientifique est équivoque et incomplète en ce qui a trait aux effets comportementaux de ces mesures préventives liées à une augmentation des connaissances en SP sur les conduites de jeu. Cloutier et ses collaborateurs (2006), Ladouceur et Sévigny (2003), de même que Steenbergh et ses collaborateurs (2004) par exemple, ont mené des études en laboratoire, respectivement auprès de joueurs d'ALV réguliers (une fois par mois ou plus), puis auprès d'étudiants appelés à jouer à un jeu de roulette sur un ordinateur. Pendant une séance de jeu expérimentale, certains participants ont vu apparaître sur leur écran des messages éducatifs concernant les SP des JHA, alors que d'autres ont plutôt dû prendre une pause de la même durée que la présentation des messages ou n'étaient pas interrompus du tout. De manière contre-intuitive, les informations concernant les SP n'ont pas incité les participants à modifier leurs comportements de jeu et ont joué autant de parties que ceux n'ayant pas reçu ces informations.

D'autres études ont plutôt examiné l'impact de connaissances mathématiques préalables, acquises par l'éducation, sur les cognitions et les comportements de jeu, pendant des séances de jeu en laboratoire. Dans l'étude de Pelletier et Ladouceur (2007) par exemple, trente étudiants universitaires faisant partie de programmes fortement liés aux mathématiques ont été comparés à 30 autres étudiants de programmes plus sociaux ou artistiques (Pelletier & Ladouceur, 2007). Des questions sur les probabilités de jeux de cartes et de dés ont été posées aux participants pour garantir l'hétérogénéité des groupes concernant leurs connaissances mathématiques (Pelletier & Ladouceur, 2007). Les comparaisons ont été effectuées à partir des résultats à un questionnaire visant à relever le recours à des stratégies comportementales irrationnelles à l'égard des ALV, de même qu'à partir de l'observation par enregistrement vidéo de ces stratégies utilisées pour générer une séquence de pile ou face « le plus au hasard possible » et des gestes irrationnels posés visant à contrôler le jeu sur un ALV (Pelletier & Ladouceur, 2007). L'analyse de leurs résultats a révélé chez les participants ayant de meilleures connaissances en mathématiques plus de comportements erronés, de même que des durées de jeu

significativement plus longues qu'au sein du groupe de comparaison (Pelletier & Ladouceur, 2007).

Pour leur part, Williams et Connolly (2006) ont choisi d'évaluer par questionnaire les perceptions erronées et les comportements de jeu dans la vie quotidienne d'étudiants ayant suivi un cours de SP régulier, un cours de SP dont les exemples et exercices ont été volontairement présentés sous l'angle des JHA ou un cours sans mathématique ayant servi de condition contrôle. Bien que les perceptions erronées liées au jeu des étudiants des deux conditions expérimentales ont été moindres que celles du groupe contrôle, les chercheurs n'ont pas rapporté de conduites de jeu différentes.

Les personnes ayant étudié dans des domaines liés aux SP ne semblent pas appliquer leurs connaissances à leurs comportements pendant des séances de jeu, puisqu'elles ne démontrent pas de comportement de jeu différent de celles n'ayant pas étudié le sujet ou persistent et jouent plus longtemps. De plus, bien qu'intéressantes, ces études n'apportent pas de réponse quant aux comportements de jeu véritables des personnes possédant des connaissances dans le domaine des SP en particulier, dans leur vie de tous les jours, soit leurs taux de participation, leur fréquence de jeu, les montants qu'ils misent aux JHA ou la présence de problèmes de jeu d'argent pathologique ou de jeu à risque. En effet, hormis les travaux de Williams et Connolly (2006) qui ont effectivement recueilli ces données, les personnes étudiées n'étaient pas placées dans des situations où elles ont misé leur propre argent, ce qui rend difficile la généralisation des conclusions qu'on peut en tirer. Ces recherches ne mesurent pas non plus les connaissances mathématiques de leurs participants, elles n'ont pas écarté des analyses les personnes ayant étudié dans un domaine lié aux SP mais ayant tout de même de faibles connaissances et n'ont pas non plus examiné l'effet des SP sur la participation à différents types de jeux.

C'est la raison pour laquelle la présente étude a voulu répondre à la question suivante : parmi les personnes ayant un haut niveau d'éducation, celles pouvant démontrer une maîtrise des SP rapportent-elles des comportements de jeu distincts? Les personnes qui ont fréquenté l'université constituent un bassin de population susceptible de permettre une réponse à cette question, puisque les notions de SP sont habituellement abordées dans les cours de mathématiques et de méthodes de recherche universitaires. Ces universitaires, étudiants ou diplômés, peuvent être considérés comme démontrant une maîtrise des SP ou non, mais ils possèdent globalement le même niveau d'éducation.

Ainsi, cette étude pose les hypothèses suivantes : (1) les universitaires démontrant une maîtrise des SP (SP+) rapporteront des taux de participation aux JHA moins élevés que ceux sans maîtrise des SP (SP-). Les individus du groupe SP+ qui participeront aux JHA rapporteront (2) des montants misés moindres, et (3) une préférence pour les jeux à composante d'habileté comparativement à ceux du groupe SP-; finalement, une maîtrise des SP prédira efficacement (4) des fréquences de jeu plus faibles et (5) l'absence de problèmes de jeu.

Méthode

Devis de recherche

La présente étude consiste en une recherche observationnelle transversale comparant les comportements de jeu des universitaires répartis en deux groupes selon leur maîtrise des SP.

Participants

Recrutement et critères de sélection. À la suite de la publicisation de prospectus de sollicitation en 2009 et 2010 à travers divers médias (journaux, babillards d'établissement d'enseignement, listes de distribution électronique, bouche-à-oreille), 291 personnes ont manifesté leur intérêt à participer à une étude portant sur les habitudes de jeu et les connaissances des SP. Afin d'éviter un biais de sélection et d'assurer que l'échantillon soit représentatif de la population universitaire générale, les participants n'étaient pas sélectionnés selon leurs habitudes de jeu. Des 154 personnes présélectionnées en fonction de leur niveau de scolarité, 143 ont complété l'ensemble de l'étude. Le taux d'achèvement de la procédure est donc de 92,9 %.

Pour atteindre les objectifs de la présente étude, seuls certains de ces participants ont été sélectionnés. Les participants ayant suivi un ou plusieurs cours de SP durant leurs études universitaires, terminées ou en cours, devaient également pouvoir démontrer leur maîtrise de la matière en remplissant avec succès un questionnaire (voir Instruments). Ces participants constituent le groupe à l'étude (SP+; $n = 45$). Ceux n'ayant jamais suivi de cours en SP et dont les réponses à un questionnaire n'ont effectivement pas démontré une maîtrise de ce sujet ont été attribués au groupe de comparaison (SP-; $n = 29$). Quant à ceux ayant déjà suivi des cours en SP mais n'étant pas parvenus à démontrer leur maîtrise de la matière en répondant au questionnaire ($n = 69$), leurs données n'ont pas été retenues dans le cadre de cette étude. L'échantillon total est donc composé de 74 participants. À la Figure 1 se trouve le détail du recrutement et de la répartition des participants.

Description de l'échantillon. L'échantillon comprend 74 participants, lesquels sont en majorité des femmes (54,1 %), nées au Québec (85,1 %), de religion catholique (78,6 %) dont le revenu brut du ménage est supérieur à 30 000 \$ annuellement (53,8 %). Les participants ont principalement complété des études universitaires de 1^{er} cycle ou de cycles supérieurs (63,0 %). La majorité des participants sont également employés (72,6 %). De ce nombre, 57,4 % des participants rapportent qu'aucune connaissance des SP n'est requise pour occuper cet emploi. Les participants du groupe SP+ sont cependant significativement plus jeunes (26,23 ans [ÉT = 4,51 ans] c. 34,34 ans [ÉT = 10,91 ans], $t(34,383, N = 73) = 3,797, p = 0,001$) que les participants du groupe SP-. Ils sont également plus nombreux à se déclarer célibataires (73,3 % c. 48,3 % [$\chi^2(1, N = 74) = 4,778, p = 0,029$]). Le Tableau 1

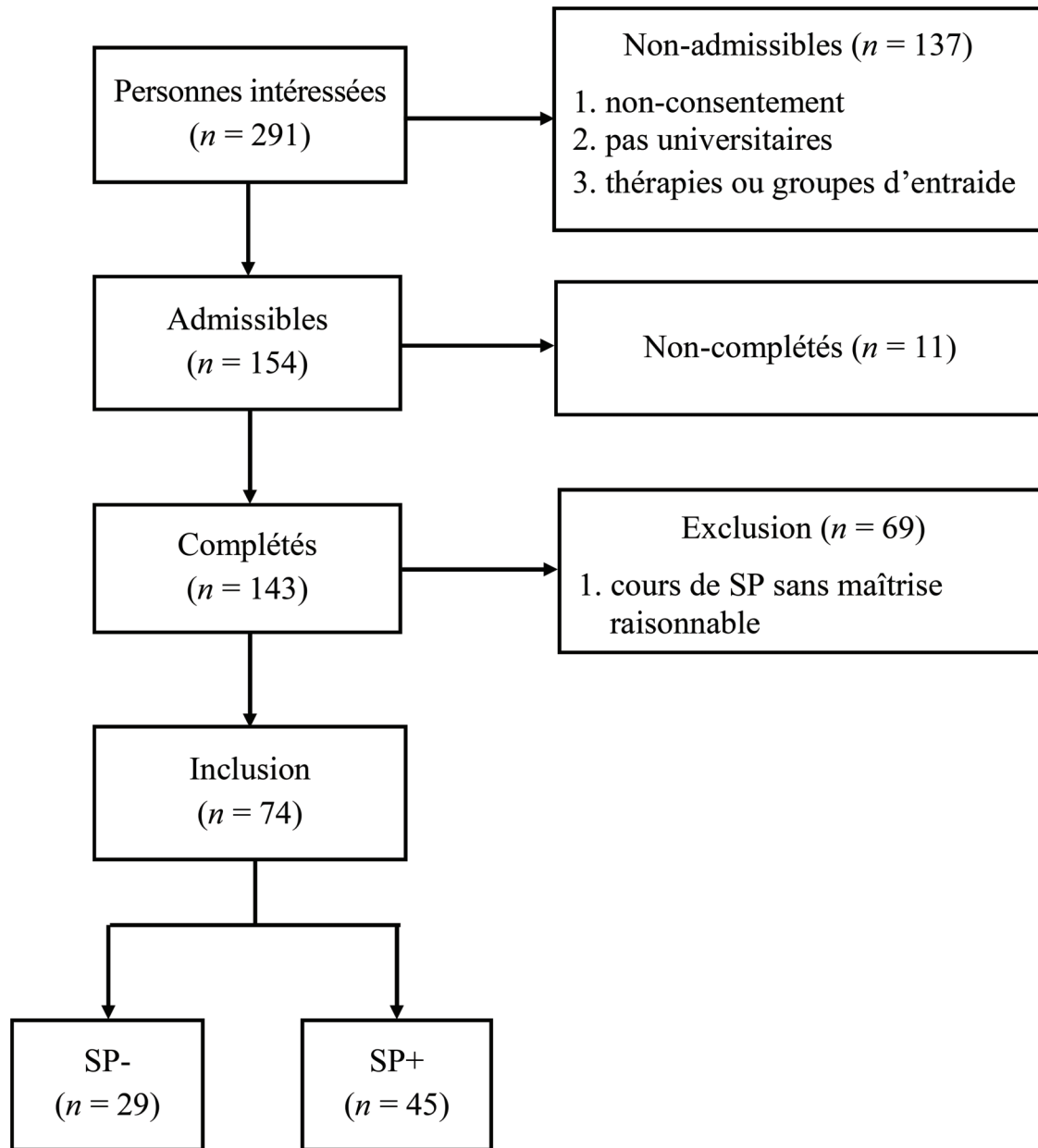


Figure 1. Recrutement et assignation des participants.

présente les caractéristiques sociodémographiques des participants selon leur groupe d'appartenance.

Instruments

Les données ont été recueillies par l'entremise d'une entrevue téléphonique ainsi que par la participation à un questionnaire auto-administré, envoyé par la poste et contenant les instruments de mesure décrits ci-dessous. D'autres instruments mesurant les croyances liées au jeu, les degrés d'optimisme et la nature du lieu de

Tableau 1

Caractéristiques sociodémographiques des participants, selon les groupes (%)

Caractéristiques	SP- (n = 29)	SP+ (n = 45)	Niveau de signification
Sexe			
Féminin	48,3	57,8	0,423 ^a
Lieu de naissance			
Province de Québec	86,2	84,4	0,835 ^a
Appartenance religieuse (n = 70)	(n = 29)	(n = 41)	
Catholique	86,2	73,2	0,244 ^b
Revenu annuel brut du ménage (n = 65)	(n = 25)	(n = 40)	
Plus de 30 000 \$	68,0	45,0	0,070 ^a
Scolarité complétée (n = 73)	(n = 28)	(n = 45)	
Baccalauréat complété ou plus	57,1	66,7	0,412 ^a
Statut d'emploi (n = 73)	(n = 28)	(n = 45)	
Occupent un emploi	71,4	73,3	0,859 ^a
Proportion d'emploi liée aux SP (n = 54)	(n = 20)	(n = 34)	
0 %	70,0	50,0	0,151 ^a
Statut civil			
Célibataire	48,3	73,3	0,029 ^a
Âge (n = 73)	(n = 29)	(n = 44)	
M	34,34	26,23	0,001 ^c
ÉT	10,91	4,51	

Note. ^aKhi-carré de Pearson. ^bTest exact de Fisher. ^cTest *t* de Student.

contrôle ont également été administrés, mais seuls les instruments aux fins de cet article y sont décrits.

Comportements de jeu et type de jeux préféré. *L'Inventaire des jeux de hasard et d'argent* (Ladouceur, Jacques, Chevalier, Sévigny, & Hamel, 2005) détermine la fréquence de participation, de même que les montants misés à 15 différents JHA au cours des 12 derniers mois. Ce questionnaire maison a été utilisé lors de l'étude de prévalence menée au Québec en 2002 (Ladouceur et coll., 2005). À partir des données tirées de cet instrument, il est possible de calculer les taux de participation, la fréquence de participation et les montants misés pour chacun des JHA, pour les jeux de hasard pur ou à composante d'habileté spécifiquement, de même que pour le jeu en général, tous jeux confondus.

La fréquence de participation des 12 derniers mois réfère à la plus élevée de toutes les fréquences rapportées aux différents JHA. Ainsi, une personne s'adonnant à la loterie une fois par semaine, mais jouant des montants plus importants aux cartes quelques fois par année a été considéré comme ayant une fréquence de jeu hebdomadaire. Pour ce qui est des montants misés dans le dernier mois, les montants rapportés pour chaque jeu s'additionnent dans les analyses par type de jeu ou pour les JHA en général. Pour les montants misés au jeu, la consigne initiale du questionnaire a été adaptée de sorte que les participants se réfèrent à leur argent personnel plutôt qu'à celui comptabilisé à partir de leurs gains et de leurs pertes, tentant ainsi de régler une ambiguïté souvent relevée

dans cette évaluation au sein des études mesurant les habitudes de jeu (Blaszczynski, Ladouceur, Goulet, & Savard, 2006).

Aux fins de l'étude et selon les tendances dans la recherche concernant les JHA (Bjerg, 2010; Boutin, 2010; Mouneyrac et coll., 2017), les loteries régulières (6/49, Lotto-Max, etc.), les loteries instantanées, aussi appelées « gratteux », l'achat de billets de tirage ou de collectes de fonds, le bingo, les ALV et les machines à sous dans les casinos sont considérés comme des jeux de hasard pur. Quant aux JHA avec composante d'habileté, ils réfèrent aux courses hippiques, aux jeux de table dans les casinos (blackjack, poker), aux paris sportifs, aux jeux de cartes (poker), aux paris sur des jeux d'adresse ou aux jeux vidéo, aux paris sur Internet (poker en ligne), de même qu'aux paris à la bourse. Cette catégorisation est utilisée pour discuter des comportements de jeu par types de jeu, de même que pour discuter du type de jeu préféré. Le type de jeu préféré se déduit par le type de jeu auquel un participant a joué la plus grosse somme d'argent annuellement, à partir du produit des montants misés dans le dernier mois et de la fréquence de jeu.

Dépistage des problèmes de jeu. Par souci de comparabilité des résultats obtenus, la version française (Ladouceur, 1991) du *South Oaks Gambling Screen* (SOGS; Lesieur & Blume, 1987) adapté aux entrevues téléphoniques (Volberg & Steadman, 1988) a été administrée. Parmi les outils de dépistage du jeu d'argent pathologique disponibles au moment de mener l'étude, le *SOGS* était l'un des plus largement utilisés, notamment en raison de sa forme normalisée et de ses bonnes propriétés psychométriques. Le *SOGS* possède une validité de construit de 0,94, une cohérence interne (alpha de Cronbach) de 0,97, de même qu'un coefficient de fidélité de type test-retest de 0,71 (Lesieur, 1994). Sa version française a aussi démontré de bonnes qualités psychométriques (Ladouceur, 1991; Ladouceur, Dubé, & Bujold, 1994a, 1994b; Lesieur & Blume, 1987). Ses différents items proviennent des critères diagnostiques du jeu d'argent pathologique du *DSM-III* (APA, 1980). Un score de 3 ou 4 points détermine les personnes présentant les caractéristiques de joueurs à risque, tandis qu'un score de 5 ou plus représente le cas d'un joueur pathologique probable (Ladouceur, 1991).

Connaissances des SP. Dix questions à choix multiples tirées du *Test d'auto-évaluation des mathématiques* (Noël, 2002) de l'université à distance de l'Université du Québec (TÉLUQ) ont été soumises aux participants. Ces questions portaient sur les statistiques descriptives, comme les notions de moyenne, d'écart-type et de corrélation, sur l'interprétation de tableaux ou de données statistiques, de même que sur les règles régissant le calcul des probabilités. Ce test est conçu de sorte à vérifier si les connaissances acquises au préalable sont suffisantes pour amorcer des programmes universitaires exigeant une maîtrise minimale des mathématiques (Noël, 2002). Le test comporte six sections de cinq questions chacune : le langage mathématique, les éléments d'algèbre, les équations, les fonctions, les statistiques, ainsi que les probabilités. Un score de 60 % et plus, soit 18 bonnes réponses sur une possibilité de 30, réfère à une maîtrise raisonnable des mathématiques (Noël, 2002). Seules les sections sur les statistiques et sur les probabilités ont été utilisées, puisqu'elles sont plus pertinentes pour prédire les

comportements de jeu. Un point de rupture à 6 bonnes réponses sur 10 a été utilisé pour référer à une maîtrise des SP. Les données recueillies auprès des participants de cette étude ont dévoilé un coefficient alpha de Cronbach de 0,79, représentant une cohérence interne tout à fait acceptable (Hogan, 2013).

Informations sociodémographiques. Neuf questions recueillent les données sociodémographiques suivantes : l'âge, le sexe, le lieu de naissance, la langue maternelle, l'appartenance religieuse, l'état civil, le niveau et le domaine de scolarité, les rendements scolaires, les établissements fréquentés, le statut occupationnel et la situation économique. D'autres questions ciblent le sujet de l'étude, soient les habiletés mathématiques requises pour exercer leur emploi, la nature de celui-ci et les cours de SP suivis lors de leur parcours universitaire.

Procédure

La première auteure de l'étude a contacté les individus qui ont manifesté leur intérêt pour participer à l'étude. Ce premier contact a permis d'aborder les objectifs de l'étude, sa nature, les conséquences de leur participation, puis de vérifier si les personnes étaient pré-admissibles et consentaient verbalement à participer à l'entrevue téléphonique et à recevoir le questionnaire par la poste. Les participants ont ensuite répondu à une entrevue téléphonique visant à répertorier leurs comportements et leurs problèmes de jeu à l'aide de l'inventaire des JHA (Ladouceur et coll., 2005) et du *SOGS* (Lesieur & Blume, 1987).

Les participants ont ensuite reçu par la poste une lettre de présentation expliquant l'étude, un formulaire de consentement écrit à signer et à retourner, un questionnaire composé des questions du test sur les SP (Noël, 2002), des questions sociodémographiques, de même que des instruments de mesure non utilisés pour cet article, le tout accompagné d'une enveloppe de retour préaffranchie et d'une liste de ressources pour le jeu ou la détresse psychologique.

Les participants qui ont retourné le questionnaire ont reçu un chèque de 20 dollars en guise de dédommagement pour leur participation. Ceux n'ayant pas retourné leur questionnaire quatre semaines après l'entrevue téléphonique ont été relancés, puis ceux qui ont choisi de ne pas le retourner ont reçu dix dollars pour leur participation à l'entrevue téléphonique. Cette étude a obtenu un certificat de conformité éthique par un des comités d'éthique de la recherche avec des êtres humains de l'Université Laval (CÉRUL : 2008-267).

Analyses statistiques

Des tests de proportion du khi-carré de Pearson et des tests *t* de Student ont été effectués pour vérifier l'équivalence des groupes sur les variables sociodémographiques. Ensuite, pour répondre aux objectifs de l'étude, les analyses effectuées ont vérifié si les comportements de jeu (participation, fréquence de jeu, montants misés, préférence en fonction du type de jeu et présence de comportements de jeu à risque

ou pathologique) du groupe à l'étude (SP+) diffèrent du groupe de comparaison (SP-) ou s'ils peuvent prédire l'appartenance à l'un ou l'autre des groupes. Les tests d'hypothèse ont été exécutés pour les tous les JHA confondus, de même que par type de jeu (de hasard pur ou à composante d'habileté), mais pas pour chacun des jeux sondés individuellement en raison de leurs petits effectifs. Toutes les analyses statistiques ont été effectuées avec le logiciel IBM SPSS Statistics 25.0 et les différences ont été jugées significatives à $p < 0,05$.

Pour relever la présence de différences significatives entre les groupes sur les variables dichotomiques nominales, soit les taux de participation et le type de jeu préféré (de hasard pur ou à composante d'habileté), des tests du khi-carré de Pearson ont été utilisés lorsque les conditions de validité des tests paramétriques étaient réunies. Sinon, le niveau de signification (p -value) du test exact de Fisher a été retenu. L'hypothèse concernant le type de jeu préféré a été testée auprès des participants ayant joué dans les douze derniers mois uniquement ($n = 67$).

Afin de tenir compte du caractère ordinal des données de fréquence de jeu dans les douze derniers mois et de celles de dépistage des problèmes de jeu, des modèles linéaires généralisés logistiques à réponses multinomiales ordinales ont été utilisés afin de vérifier si une maîtrise des SP prédit efficacement la fréquence de jeu ou l'absence de problème de jeu, tout en contrôlant les covariables « État civil » et « Âge » des participants, connues pour influencer les comportements de jeu, en les ajoutant progressivement au modèle et ainsi contrôler leur effet sur la fréquence de jeu (Howell, 2010). Toutefois, aucune des variables de fréquence n'a été influencée par ces covariables lors des analyses (tous les $ps > 0,05$). Pour cette raison, le modèle retenu pour analyse ne les inclut pas et vérifie seulement si la variable « Groupe » prédit les variables de fréquences.

En ce qui concerne les sommes d'argent mises, les données analysées ne proviennent que des participants ayant joué dans le dernier mois ($n = 56$). Il est également à noter que dès qu'un individu mise un tant soit peu plus que les autres, statistiquement, ses données se présentent comme des valeurs aberrantes. Dans le cas présent, il a été décidé qu'elles ne seraient pas retirées de l'ensemble des données lorsque possible, car même si elles sont extrêmes d'un point de vue mathématique, elles ne représentent pas des données insensées. Pour cette raison, les hypothèses ont alors été testées par la modélisation de l'analyse de variance du logarithme des données. Cette méthode paramétrique utilisant des données transformées a été privilégiée afin de profiter de la puissance de ce type de tests. Toutefois, l'analyse non-paramétrique du U de Mann-Whitney a aussi été effectuée pour sa robustesse et les mêmes résultats sont obtenus.

Résultats

Comportements de jeu aux JHA dans les douze derniers mois

Les tests de comparaison de proportions n'ont relevé aucune différence significative entre les groupes SP+ et SP- quant aux taux de participations aux JHA, aux JHA de

Tableau 2

Taux de participation aux JHA, selon les groupes (%)

Variables	Total (<i>n</i> = 74) <i>n</i> (%)	SP- (<i>n</i> = 29) <i>n</i> (%)	SP+ (<i>n</i> = 45) <i>n</i> (%)	Niveau de signification
Tous JHA confondus	69 (93,2)	28 (96,6)	41 (91,1)	0,642 ^a
JHA de hasard pur	64 (86,5)	27 (93,1)	37 (82,2)	0,298 ^a
JHA habileté	39 (52,7)	16 (55,2)	23 (51,1)	0,733 ^b
Loterie régulière	48 (64,9)	17 (58,6)	31 (68,9)	---
Loterie instantanée	32 (43,2)	14 (48,3)	18 (40,0)	---
Loterie sportive	7 (9,5)	3 (10,3)	4 (8,9)	---
Billets de tirage	35 (47,3)	16 (55,2)	19 (42,2)	---
Courses de chevaux	1 (1,4)	0 (0,0)	1 (2,2)	---
Bingo	10 (13,5)	6 (20,7)	4 (8,9)	---
ALV	10 (13,5)	6 (20,7)	4 (8,9)	---
Machines à sous	16 (21,6)	5 (17,2)	11 (24,4)	---
Jeux de table	7 (9,5)	4 (13,8)	3 (6,7)	---
Pari sportif	16 (21,6)	5 (17,2)	11 (24,4)	---
Jeux de cartes (poker)	28 (37,8)	12 (41,4)	16 (35,6)	---
Jeux d'adresse	2 (2,7)	2 (6,9)	0 (0,0)	---
Jeux vidéo	2 (2,7)	1 (3,4)	1 (2,2)	---
Paris sur Internet (poker)	8 (10,8)	4 (1,4)	4 (8,9)	---
Bourse	3 (4,1)	1 (3,4)	2 (4,4)	---

^a Test exact de Fisher. ^b Khi-carré de Pearson.

hasard pur ou aux JHA à composante d'habiletés ($p_s > 0,05$). Les proportions de participation sont présentées au Tableau 2 pour chacun des JHA sondés à des fins de comparaison.

Chez les participants ayant joué à un JHA (tous jeux confondus) dans la dernière année, la maîtrise des SP ne permet pas de prédire la fréquence de jeu dans les douze derniers mois (voir Tableau 3), ni pour les JHA en général ($\chi^2_w(1, N = 69) = 0,371$, $p = 0,543$), ni pour les JHA de hasard pur ($\chi^2_w(1, N = 64) = 0,406$, $p = 0,524$) ou les JHA avec composante d'habileté ($\chi^2_w(1, N = 39) = 0,259$, $p = 0,611$). Plus de la moitié des participants ayant joué à des JHA dans la dernière année ont joué moins d'une fois par mois (SP- : 50,0 %; SP+ : 58,5 %).

Troisièmement, tel que présenté au Tableau 4, l'analyse de variance détermine que les moyennes des montants totaux misés pour tous les JHA ne diffèrent pas d'un groupe à l'autre (SP- : $\bar{X} = 73,68$ \$ [ÉT = 143,67 \$] c. SP+ : $\bar{X} = 42,13$ \$ [ÉT = 104,76 \$]), $F(1,52) = 0,613$, $p = 0,437$. Pour l'ensemble des JHA, la médiane se situe à 10 dollars dans le dernier mois chez les participants du groupe SP- et à 11 dollars chez les participants du groupe SP+. Il n'y a pas non plus de différence significative entre les moyennes des sommes des montants misés pour les JHA de hasard pur ($F(1,49) = 2,324$, $p = 0,134$) ou pour les JHA à composante d'habileté ($F(1,20) = 0,002$, $p = 0,963$).

Tableau 3

Répartition des fréquences de participation aux JHA, chez les joueurs, selon les groupes (%) (n variables)

Variables	SP- (%)	SP+ (%)
À au moins un JHA		
<i>N</i>	28	41
Quelques fois dans les douze derniers mois	50,0	58,5
Environ une fois par mois	25,0	19,5
Quelques fois par mois	7,1	9,8
Environ une fois par semaine	10,7	4,9
Quelques fois par semaine	7,1	0,0
Chaque jour	0,0	7,3
À au moins un JHA de hasard pur		
<i>N</i>	27	37
Quelques fois dans les douze derniers mois	55,6	62,2
Environ une fois par mois	22,2	18,9
Quelques fois par mois	7,4	10,8
Environ une fois par semaine	7,4	8,1
Quelques fois par semaine	7,4	0,0
À au moins un JHA à composante d'habileté		
<i>N</i>	16	23
Quelques fois dans les douze derniers mois	62,5	73,9
Environ une fois par mois	18,8	8,7
Quelques fois par mois	6,3	4,3
Environ une fois par semaine	6,3	0,0
Quelques fois par semaine	6,3	0,0
Chaque jour	0,0	13,0

Tableau 4

Analyses paramétriques pour les variables de montants misés au jeu auprès des joueurs spécifiquement (n variables)

Variables	<i>M</i> (\$)	<i>ÉT</i> (\$)	<i>Md</i> (\$)
À au moins un JHA ^a		$F(1,52) = 0,613, p = 0,437$	
SP- (<i>n</i> = 22)	73,68	143,67	10,00
SP+ (<i>n</i> = 32)	42,13	104,76	11,00
À au moins un JHA de hasard pur		$F(1,49) = 2,324, p = 0,134$	
SP- (<i>n</i> = 20)	62,65	123,94	9,00
SP+ (<i>n</i> = 31)	16,16	27,81	6,00
À au moins un JHA à composante d'habileté ^a		$F(1,20) = 0,002, p = 0,963$	
SP- (<i>n</i> = 11)	33,09	32,73	20,00
SP+ (<i>n</i> = 11)	88,82	169,78	20,00

^a Les statistiques descriptives et l'analyse de variance ne tiennent pas compte d'une donnée extrême de 5070,00 \$.

Type de jeux préféré

La valeur p du test exact de Fisher indique qu'il n'y a aucune différence significative entre les groupes en ce qui a trait au type de JHA préféré ($p = 0,217$). Plus de quatre universitaires sans maîtrise des SP sur cinq ont préféré les JHA de hasard pur, tel que déterminé par le type de jeux auquel ils ont misé la plus grosse somme d'argent annuellement, contre un peu moins des trois quarts des universitaires démontrant une maîtrise des SP.

Dépistage des problèmes de jeu

L'analyse des scores des problèmes de jeu de l'ensemble des participants de l'échantillon démontre que ceux ayant endossé des items pouvant indiquer des comportements de jeu à risque probable ou de jeu d'argent pathologique probable dans la dernière année ne se retrouvent pas plutôt dans un groupe que dans l'autre, $\chi^2_w(1, N = 74) = 0,895, p = 0,344$). Aucun individu des deux groupes n'est joueur à risque, deux individus (6,9 %) sont considérés joueurs pathologiques probables dans le groupe SP- contre une seule personne (2,2 %) parmi les participants du groupe SP+, ce qui équivaut à 4,1 % de l'échantillon total.

Discussion

L'objectif principal de cette étude visait la comparaison des comportements de jeu d'universitaires ayant démontré une maîtrise des SP ou non, dans le but de vérifier si ces connaissances s'associent à des comportements de jeu différents. Aucune des hypothèses formulées à cet effet n'a été confirmée. Les participants universitaires pouvant démontrer une maîtrise des SP rapportent des comportements de jeu similaires à ceux d'autres participants, et ce tant pour les JHA en général que pour les JHA de hasard pur ou les JHA à composante d'habileté. Ils ne préfèrent pas les activités avec composante d'habileté et ne sont pas moins nombreux à présenter des indices de jeu à risque ou de jeu d'argent pathologique.

Ce constat est alarmant en raison de l'importance accordée aux connaissances en SP en tant que facteur de protection contre la dépendance aux JHA. L'hypothèse sous-jacente à la majorité des programmes de prévention et de traitement des problèmes de jeu utilisés à ce jour repose sur ce potentiel d'immunisation au jeu par une éducation aux SP des JHA, ce qui ne s'est pas avéré juste dans la présente étude. À ce jour, aucune étude n'est encore parvenue à démontrer un tel effet immunisant d'une éducation aux SP, malgré des tentatives pourtant répétées qui ont toutes abouti à une absence de résultat.

Des comportements de jeu similaires, peu importe les connaissances

La maîtrise des SP ne paraît pas influencer la participation des universitaires sondés à des JHA. Plus de 90 % des participants démontrant une maîtrise des SP ont indiqué avoir participé aux JHA dans les 12 derniers mois, ce qui représente la même

proportion que les autres participants. De plus, ils parient de l'argent à tous les types de JHA. En ce qui a trait aux fréquences et aux montants misés par ailleurs, les joueurs de l'échantillon ayant une maîtrise des SP n'ont pas non plus joué moins souvent ou des sommes moindres aux JHA au courant de l'année que les autres, contrairement à ce qui était attendu. On aurait pu s'attendre à ce que les occasions de jeu soient davantage isolées, confinées à des situations sociales exceptionnelles. Les joueurs SP+ jouaient peu fréquemment et de petits montants, certes, mais pas moins que ceux n'ayant pas de connaissance des SP. Comment se fait-il que ces gens jouent tout de même, plus encore à des JHA sans aucune composante liée à l'habileté?

Les connaissances en SP influencent peu le choix d'un jeu occasionnel

Les universitaires en provenance des deux groupes préfèrent les mêmes jeux. Ce résultat va lui aussi à l'encontre de l'hypothèse émise selon laquelle les participants ayant suivi des cours de SP auraient une préférence pour les jeux à composante stratégique. Autrement dit, le fait de maîtriser les SP n'empêche pas les participants à l'étude de jouer à des jeux de hasard pur, ni ne les pousse à participer davantage à des jeux à composante d'habileté.

Encore une fois, la faible proportion de joueurs et, qui plus est, de joueurs réguliers, rend hasardeuse l'interprétation de ce résultat puisque de façon descriptive, la tendance veut que ce soit les participants ayant une maîtrise des SP qui misent davantage à des JHA à composante stratégique qu'à des jeux de hasard pur (26,8 % c. 11,5 %). Également, le peu d'écart traduit possiblement un certain biais historique : le poker était une activité à composante d'habileté répandue dans les années 2000, particulièrement chez les universitaires de tous les milieux (Bjerg, 2010; Dufour, Brunelle, Roy, Nadeau, & Kairouz, 2016; Kairouz & Nadeau, 2014). Lorsque les personnes jouent peu, la connaissance des SP n'est peut-être pas un choix discriminant. Si les participants avaient eu à nommer le jeu auquel il accepterait de jouer chaque semaine, peut-être que ceux du groupe SP seraient plus susceptibles de choisir un JHA à composante d'habileté. Par ailleurs, cette étude ne s'est pas intéressée à la façon dont opèrent les connaissances des SP des individus quand elles sont utilisées dans des contextes réels de jeu. Les participants ayant démontré une maîtrise des SP se servent-ils de leurs connaissances lorsqu'ils choisissent de participer à un JHA? Leur maîtrise mathématique influence-t-elle leur motivation à jouer?

Peu de problèmes de jeu, peu importe les connaissances

Quant au jeu d'argent pathologique, l'étude ne permet pas de montrer que le fait de maîtriser les SP soit associé à une prévalence réduite des problèmes de jeu des participants. La répartition des joueurs problématiques est la même chez les participants pouvant démontrer une telle maîtrise ($n = 1$) que chez les autres ($n = 2$). Pour un participant, la maîtrise des SP n'a pas empêché la présence d'un problème de jeu.

Un portrait du jeu universitaire

La recherche antérieure a établi une corrélation entre des études supérieures et une plus grande propension au jeu (Kairouz & Nadeau, 2014), et il semblerait que les universitaires questionnés pour la présente étude ne fassent pas exception à la règle : moins d'une personne sur dix a rapporté ne pas avoir joué du tout (SP- : 3,4 %; SP+ : 8,9 %). De manière descriptive, en comparaison, Kairouz & Nadeau (2014) rapportent une proportion de non-joueurs de 33,4 % à l'échelle provinciale, 29,8 % chez les diplômés collégiaux et 37,7 % chez les diplômés universitaires, pour leur étude réalisée en 2012. Près des deux tiers d'entre eux achètent des billets de loterie régulière, peu importe leurs connaissances des probabilités, alors que le taux de retour de cette activité de jeu est inférieur à 50 %. Cette participation à la loterie régulière est cependant moindre que la moyenne québécoise (64,9 % c. 91,0 %; Kairouz & Nadeau, 2014), mais les participants de l'étude se montrent nettement plus intéressés à jouer aux cartes pour de l'argent que ceux de l'enquête provinciale (37,8 % c. 7,0 %; Kairouz & Nadeau, 2014). Ces résultats corroborent ceux publiés par le passé voulant que les personnes les plus éduquées participent davantage à des JHA à composante d'habileté, mais les différences quant aux choix de jeu ont touché les universitaires en général, sans égard à leur maîtrise des SP. Cet attrait pour les cartes, le poker particulièrement, peut être partiellement expliqué par la grande popularité du poker auprès des jeunes adultes universitaires dans les années 2000 (Bjerg, 2010; Dufour et coll., 2016), laquelle s'est toutefois essouffée après 2010. Seulement, l'engouement pour le poker s'est tout autant manifesté chez des personnes n'ayant pas de connaissances des SP.

Dans les douze derniers mois, la plupart des participants n'ont joué qu'à quelques occasions ou pas du tout à certains jeux soit les loteries sportives, les courses de chevaux, le bingo, les ALV, les machines à sous, les jeux de table, les paris sportifs, les jeux d'adresse, vidéo ou de société, les paris sur Internet et à la bourse. Moins du quart de l'échantillon a joué environ une fois par mois ou plus à la loterie régulière ou instantanée, à des jeux de cartes ou a participé à des tirages ou des collectes de fonds. La moitié de l'échantillon n'a dépensé que six dollars dans le dernier mois aux JHA. De façon générale, les participants de l'étude, qu'ils maîtrisent ou non les SP, ne sont pas des joueurs réguliers. Ceci rejoint les résultats de Kairouz & Nadeau (2010) voulant que les étudiants universitaires jouent rarement, moins d'une fois par mois majoritairement, pour tous les jeux, à l'exception du poker en ligne qui attire au moins mensuellement ses adeptes universitaires. Il est difficile de conclure dans cette situation à l'inefficacité de la maîtrise des SP à réduire les comportements de jeu. Reproduire cette étude auprès d'une population de joueurs réguliers permettrait peut-être de relever des différences entre les groupes.

Les joueurs pathologiques probables interrogés pour cette étude connaissaient principalement des difficultés liées à leurs comportements de jeu aux appareils électroniques de jeu (ALV et machines à sous), de même qu'au jeu en ligne, sans égard à leur maîtrise des SP. Cela correspond au portrait-type du joueur pathologique décrit dans la littérature en jeu. La connaissance des SP à elle seule ne suffit

pas à prévenir le jeu d'argent pathologique. Existe-t-il des variables pouvant mieux expliquer ces résultats que la seule connaissance théorique des SP? Serait-il possible de révéler les niveaux distincts de connaissances des SP en comparant les universitaires en fonction de leurs gains respectifs dans des jeux où leurs connaissances leur donnent un certain avantage, le poker par exemple?

Forces et limites

En décidant de recruter parmi les universitaires plutôt qu'à partir d'un bassin de joueurs, les habitudes de jeu rapportées par les participants de cette étude avaient moins de chance d'être artificiellement accrues (Chrétien et coll., 2013) et pouvaient refléter davantage celles de la population générale, bien que les universitaires recrutés démontrent jouent peu, tel que discuté précédemment. Il faut donc interpréter les données de participation avec précaution, puisque les fréquences de jeu et les sommes mises, quant à elles, sont bien faibles et la taille de l'échantillon est modeste.

Il est important de rappeler que les résultats obtenus ont possiblement subi certaines distorsions en raison de la nature auto-rapportées des réponses des participants. Par exemple, malgré des consignes claires à ce sujet, il est possible que des participants aient choisi d'utiliser des ressources extérieures pour répondre au test d'auto-évaluation des mathématiques (Noël, 2002), ce qui aurait possiblement pu biaiser l'évaluation de leur appartenance à l'un ou l'autre des groupes à l'étude. Par contre, les participants étaient aveugles aux objectifs de l'étude et ils avaient été avisés que leur résultat à ce test n'influencerait pas leur participation à la recherche, ni leur dédommagement. De plus, avoir utilisé la voie postale pour soumettre les instruments aux participants a permis de rejoindre un plus grand nombre de personnes à un coût minimal.

Des précautions additionnelles ont été mises en place afin d'assurer que l'absence de résultats ne soit pas attribuable à un manque de puissance statistique. Des analyses non-paramétriques ont aussi été effectuées pour leur robustesse, bien que les résultats présentés sont ceux en provenance d'analyses paramétriques, en raison de leur puissance. Les résultats ont été les mêmes dans les deux cas. Également, bien que coûteuse en termes de taille d'échantillon, la décision d'exclure les données des participants ayant déjà été sensibilisés aux SP mais n'ayant pu démontrer leur maîtrise de la matière au test d'autoévaluation des mathématiques (Noël, 2002) a permis une distinction franche entre les groupes, améliorant du même coup la validité interne de l'étude.

Conclusion

Cette étude a permis de vérifier les comportements de jeu chez des universitaires selon qu'ils aient démontré ou non une maîtrise des SP. Plutôt que d'observer la façon de jouer aux différents JHA en termes de cognitions et de comportements en cours de périodes de jeu comme cela a été le cas dans les précédentes recherches (Benhsain et coll., 2004; Cloutier et coll., 2006; Ladouceur & Sévigny, 2003; Steenbergh et coll., 2004),

il a été question de vérifier si les universitaires maîtrisant les SP jouent effectivement à ces jeux. De plus, les participants composant ce groupe ont d'abord démontré leur maîtrise des SP.

Bien que les participants universitaires pouvant démontrer une maîtrise des SP possèdent en quelque sorte les clés d'une immunisation contre le jeu, leur participation aux différents JHA, de même que la fréquence à laquelle ils s'y adonnent ou la somme d'argent qu'ils acceptent d'y miser, ne se distinguent pas de celles des personnes n'ayant pas ces connaissances. En résumé, les scientifiques et les intervenants ayant cherché à prévenir ou à traiter le jeu d'argent pathologique l'ont surtout fait par divers programmes composés majoritairement de volets psychoéducatifs visant à augmenter les connaissances des individus au sujet de concepts mathématiques liés aux SP des JHA de façon à modifier leurs comportements. Pourtant, on ne connaît que très peu l'effet de ces connaissances, d'autant plus que les initiatives de recherches sur le sujet ont débouché sur des résultats contradictoires et contre-intuitifs.

Ceci étant dit, une reproduction de cette étude auprès d'une population de joueurs réguliers et de joueurs problématiques amènerait certainement quelques éléments de réponses aux questions soulevées dans cette discussion.

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policy paper

Optimal Public Policy for Government-Operated Gambling

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Abstract

This paper presents a framework for formulating the optimal public policy for government-operated gambling. The goal of public policy with respect to government-operated gambling is typically stated as “harm minimization.” This claim masks the possible trade-off between an increase in social harm (H) and the government’s incremental net revenue (R) from increased gambling activity. Using a graphical approach, we depict first the feasible combinations of H and R, and then identify the combinations that could be classified as efficient, thereby allowing the minimum social harm for any given level of the government’s incremental net revenue from gambling. We indicate how the optimal combination of H and R could be identified and realized in both the short and long run. We then utilize the body of research on gambling and its effects to qualify what this trade-off operates in the real world.

Keywords: trade-off, efficient, harm minimization, disordered gambling, optimal policy

Résumé

Ce document présente un cadre pour l’élaboration d’une politique publique optimale encadrant les jeux de hasard gérés par le gouvernement. L’objectif d’une politique publique en matière de jeu géré par le gouvernement vise généralement une « minimisation des méfaits ». Cela permet de dissimuler le compromis possible entre une augmentation des dommages sociaux (H) et le revenu net supplémentaire du gouvernement (R) provenant d’une augmentation des activités de jeu. À l’aide d’une approche graphique, nous décrivons d’abord les combinaisons possibles entre les méfaits sociaux et les revenus (H et R), puis nous identifions les combinaisons « efficaces », ce qui permet de réduire au minimum les méfaits pour la société à tout niveau des revenus nets supplémentaires tirés du jeu par le gouvernement. Nous indiquons comment la combinaison optimale méfaits/revenus pourrait être établie et réalisée à court et à long terme. Nous utilisons ensuite le

corpus de recherches sur le jeu et ses effets pour qualifier à quoi ressemble ce compromis dans le monde réel.

Introduction

In a world of abundance, the academic discipline of economics would not exist. Scarcity imposes limits on the feasible choices we can make. Acquiring more of one good necessitates foregoing another. A central challenge that society faces is to make the best, or *optimal* use of our scarce resources.

In examining the role of government as a monopoly provider of gambling services, clients who take part in moderate amounts of gambling for recreation and entertainment can be viewed no differently than customers in any ordinary business. Society would not maintain an ethical concern about the marketing and promotion of gambling activity for this segment of its clientele. If gambling promotion could target recreational gamblers exclusively, governments could act like private corporations in pursuit of maximum profit.

Because it is impossible to target recreational gamblers in such a manner when gambling activity is promoted, governments are faced with a trade-off. Although marketing gambling might well allow a government to realize additional net revenue, such marketing would further harm those disordered gamblers who are induced to increase their gambling activity, and it may well increase the prevalence in the population of those who gamble as well. For example, Harrah's, a casino and hotel chain located in several American cities, used marketing to "promote more frequent and longer gambling sessions among avid and experienced gamblers" and managed to double its profits in one year (Quinn, 2001, p. 134). Put simply, as revenue rises, so too does the harm caused to disordered gamblers.

Cast in this stark way, the decision by a government to forego net revenue to reduce the social harm to disordered gamblers and their families would appear to be morally compelling. When additional revenue for a government is placed on one side of a balance scale while a composite of social harms—an increase in the unsustainable losses of disordered gamblers, a potential increase in criminal activity to support their addiction, the additional stress and depression suffered by them and their families, an increase in domestic violence and family breakdowns, and the real possibility that their state of hopelessness could lead them to suicide—are placed on the other side of the balance scale, the appropriate choice for society seems obvious.

However, the conflict between money, in the form of additional tax revenue, versus the increase in social harm as two competing options, has been presented in the gambling research literature in a decidedly biased way, exemplified through the

contributions of Dickerson (2003) and Jackson, Christensen, Francis, and Dowling (2015).

The funds that are generated through the operation of casinos and lotteries can be used to reduce harm in society at large. For example, additional tax revenue could save lives by funding needle exchange programs, or by supplying Naloxone kits to neutralize the fatal effects of fentanyl. It could also be used to fund after-school programs for low-income children or many other socially worthwhile programs. It is plausible to believe that the harm caused by government-sponsored gambling could be offset by the benefits to society from the use of the resulting profits.¹ Indeed, when one weighs the harm created by the government-operated gambling activity against the harm reduction that could, potentially, be realized if the government were to deploy effectively the proceeds from its gambling operations, the choice between opposing or supporting the government's involvement in gambling on ethical grounds is far from obvious.

Professional economists generally regard their discipline as a value-free social science that provides politicians with a set of tools for evaluating alternative policies. The social goals to which these tools are applied are treated by economists as exogenously given by the politicians—who, in a highly idealized and vastly over-simplified world, are deemed to be expressing a social consensus, or “the will of the people”. In other words, the relative value of the benefits that flow from the government's net revenue and the costs to society of the harm caused by disordered gambling are ultimately subjective, and are determined by the preferences and opinions of society. Perhaps the electorate believes that if the money from the casinos can pay for 150 more hospital beds at the cost of potentially ruining the life of one disordered gambler, then it is a worthwhile trade for society. Perhaps the lives saved from these additional hospital beds are worth more than the damage caused to disordered gamblers and their families. Providing definitive guidance to answer such questions is neither the domain of the economist nor of this paper.

The far more modest technical task undertaken by economists is to determine all of the feasible alternative outcomes that are attainable by society and then to identify the optimal outcome, based on exogenously given preferences of society.

In this paper, we present a conceptual framework to analyze the trade-off between the government's incremental net revenue from its gambling operations and the resulting harm, and we illustrate how, in principle, one could determine the optimal

¹Blaszczynski, Sharpe & Walker (2001) appear to have diluted the term “harm minimisation.” For example, in their final report, *The Assessment of the Impact of the Reconfiguration on Electronic Gaming Machines as Harm Minimisation Strategies for Problem Gambling*, they assert that “harm minimisation” is “used synonymously with harm reduction” (Blaszczynski et al., p. 23, 2001). Such usage provides little guidance to a policymaker facing many difficult competing choices. Harm reduction is simply one of a multitude of social *desiderata*, such as improvements for the general population in literacy, numeracy, nutrition and longevity.

combination of the two variables, given society's preferences, both in the short and long run. We then illustrate how this framework might be applied in the real world, using selective evidence from the vast research literature on gambling.

Uncovering the Trade-Off: A Look at Efficiency

To simplify the exposition, we will describe outcomes in terms of only two variables: an index of social harms attributable to gambling activity (H) and the incremental net revenue from government-operated gambling activity (R).

Before we begin, we must first define what we mean by the government's incremental net revenue. For a governmental monopoly firm operating a gambling enterprise, its net revenue (or profit) would be the amount by which its total revenue exceeds its total cost. Its total revenue would be the total amount spent by customers on gambling activities. Its total costs would be the sum of the payments to gamblers, the rent paid (or imputed) for the use of its facilities, a depreciation charge for its buildings and equipment (if it owns these), money spent on the repair and maintenance of its facilities, and expenditures on all operating costs (including marketing and promotion, heating, lighting, air quality control, security, administrative and employee salaries). Tax payments, if any, could be treated simply as a transfer from one pocket of the government to another.

Unfortunately, this picture of government's net revenue (or profit) significantly overstates the net contribution that a government's gambling operations can make to funding hospitals, education, infrastructure, and so on. As Henriksson and Lipsey (1999, p. 260) have observed, the government's monopoly profit from gambling fails to take into account the taxes that are foregone from other sources with the introduction of government-operated gambling activities. For example, the introduction of a casino into a community may well divert customers from other businesses in the area, since money that could have been spent at existing establishments is instead spent at the casino. Following the introduction of casinos in Atlantic City in 1978, one-hundred of the city's two-hundred and fifty restaurants were driven out of business (Henriksson, 1996, p. 117). As a result of this "crowding out effect," the government lost tax revenue that it could have levied if those businesses had remained open or performed better. The government's incremental net revenue that results from its introduction of gambling is its monopoly profit from gambling activities minus the tax revenue that is foregone from the crowding out effect of the gambling activities (Lipsey and Henriksson, 1999, p. 260). Therefore, this paper defines R as the government's incremental net revenue to reflect the actual benefits realized by society from the presence of government-operated gambling.

Having clearly defined the variables we will be using, we can proceed to develop our framework to shed light on the trade-off between H and R . Consider the B_0 curve in Figure 1. All points on or above the B_0 curve, such as points A, B and C, are feasible; that is, given the possible ways the government can manage its gambling operations, these combinations of H and R are attainable.

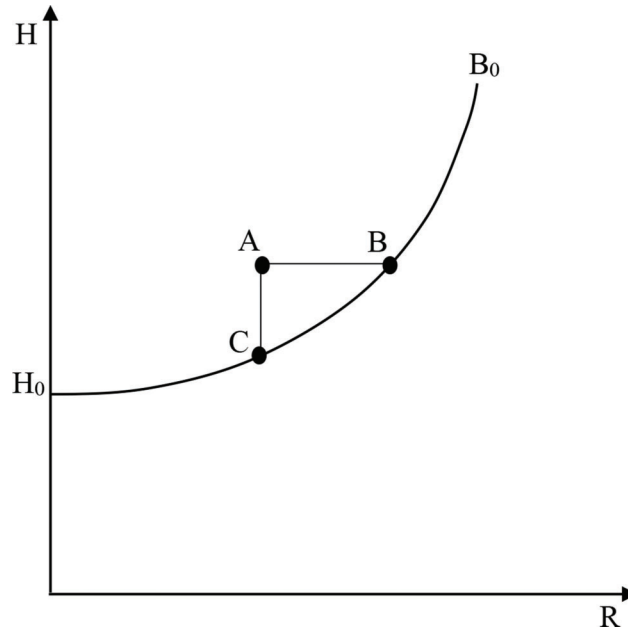


Figure 1. The B_0 curve depicts the efficient boundary of feasible R and H combinations. Above the B_0 curve R can be increased without increasing H and H can be reduced without decreasing R . Points below B_0 are not attainable.

An example of a change in the way in which gambling operations are managed, and thus a movement from one feasible point to another, would-be casinos reducing their hours of operation. Such action has been taken by some countries as a way of curbing disordered gambling (Quinn, 2001, p. 136). Presumably, H would be reduced, but so too would R , since the casino would forego revenue it could have realized had its hours of operation not been curtailed. This change could be imagined as moving from B to C in Figure 1, since there is a trade-off between H and R . More generally, reducing both H and R could be represented by moving from any feasible point to another that is to the left and below the original point.

Although all of the points on or above the B_0 curve are feasible, only those points on the B_0 curve are efficient. Efficiency is defined here as a combination of H and R in which the only way to reduce H is to also reduce R , and the only way to increase R is, at the same time, to increase H . Although point A is feasible, it is clearly inefficient, since we could move to point C and achieve less harm with the same incremental net revenue, or to point B and achieve more incremental net revenue while holding the harm from disordered gambling constant. A movement from point A to any point that is strictly between B and C on the B_0 curve would achieve greater incremental net revenue and a reduction in harm. A similar improved outcome would be possible from any feasible point that is not on the B_0 curve. Since optimality can only be found at an efficient point, the optimal combination of R and H must accordingly lie on the B_0 curve.

At any feasible point above the B_0 curve, someone could be made better off without making anyone else worse off. A move from A to C would allow disordered gamblers and their families to become better off while allowing the beneficiaries of government programs that are funded by the incremental net revenue from gambling to become no worse off.² Likewise, the beneficiaries of government expenditures could become better off if the government were to move from A to B, while disordered gamblers would be no worse off than before the move. But, one cannot move from any point on the B_0 curve to any other feasible point without making someone worse off. Moving from one efficient point to another involves a trade-off between harm and incremental net revenue. Efficient points along the B_0 curve have the property that no individual can be made better off without making someone else worse off.

The general shape of the B_0 curve reflects the assumption that each additional dollar of the government's incremental net revenue from gambling results in social harm that increases at an increasing rate. If harm increased at a constant rate for each additional dollar of incremental net revenue, B_0 would be a straight line. Note that even if the government were to abandon completely gambling as a source of revenue, the social harm from gambling activity could not be lowered to a level below H_0 . The presence of privately operated gambling sites online or gambling venues abroad, for example, would still result in a level of social harm denoted H_0 in Figure 1. Thus, only levels of harm that exceed H_0 are attributable to the government's involvement in gambling operations.

The Quest for the Optimal Efficient Combination of H and R

Once one accepts that good social policy should ensure that society be somewhere on the B_0 curve, the question remains "Where along the B_0 curve does the socially optimal combination of the government's incremental net revenue and social harm occur?"

To answer this question, one must know society's preferences. For example, how many family breakdowns because of disordered gambling is society willing to accept to fund one additional after-school program from gambling revenue? If society could choose between a combination of three family breakdowns and four additional after-school programs or two family breakdowns and three after-school programs, which would it choose? In the general form, we must know how society ranks all the feasible combinations of H and R.

This idea is elucidated by means of "Social Indifference Curves." Two such curves, denoted I_1 and I_2 , are depicted in Figure 2 below. To know which combinations of H and R are preferred by society to other combinations, we must first know which combinations are deemed to be equally preferred. A Social Indifference Curve shows every combination of H and R between which society is "indifferent," assuming that

²Indeed, if the beneficiaries of programs funded by gambling revenue care about pathological gamblers, a move from A to C would in fact benefit them.

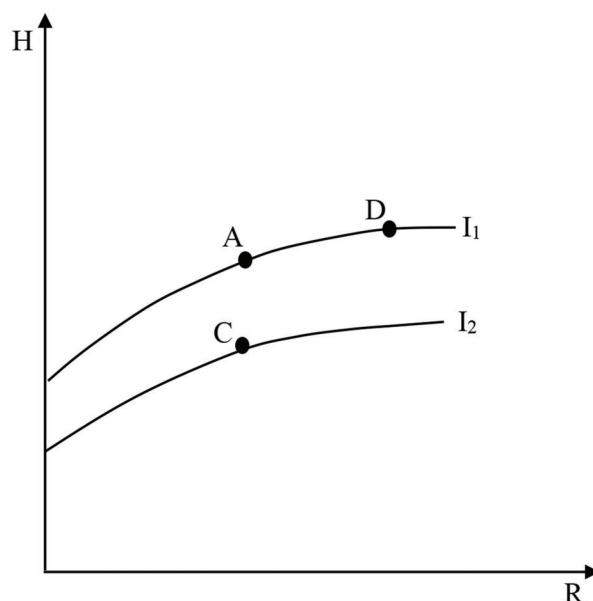


Figure 2. Two Social Indifference Curves, I_1 and I_2 ; combinations of R and H along I_2 are all equally preferred by society, and all of these are strictly preferred to combinations of R and H along I_1 .

society has reached an “ethical consensus” (Mishan, 1980, p. 148). For example, in Figure 2, I_1 tells us that the combination of H and R represented by point A provides the same utility (or happiness) to society as the combination of H and R represented by point D .

Every point on I_2 is strictly preferred by society to every point on I_1 . To explain this, consider points A and C . Precisely the same level of R is achieved at both points, but point C also results in less H . Therefore, C is strictly preferred by society to A . Since A is preferred equally to every other point along I_1 , C must be preferred to every point along I_1 . So, even though points D and C do not appear to be comparable since at D , an increase in R entails greater H , using Social Indifference Curves enables an analyst to confirm that C is preferred to D . One might imagine that D and C represent the two alternative combinations of family breakdowns and after-school programs presented earlier. Only by knowing society’s preferences, expressed through Social Indifference Curves, can an appropriate judgment about the superiority of C over D be made.

We assume that a unique Social Indifference Curve will pass through every combination of H and R . In Figure 2 we have, for illustrative purposes, depicted only two of the infinite number of non-intersecting Social Indifference Curves. Thus any combination of H and R can be compared to any other combination of H and R in the entire space of feasible combinations of H and R .

The most preferred feasible combination of H and R can be determined by superimposing Figure 2 onto Figure 1.

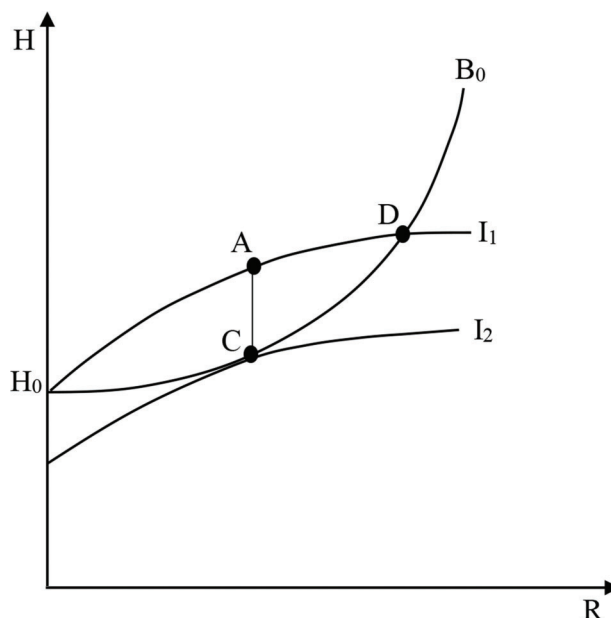


Figure 3. Point C is society's most preferred attainable combination of R and H.

As one can see from Figure 3, an efficient feasible combination of H and R along the B_0 curve that is most preferred by society occurs at point C, where the highest attainable Social Indifference Curve I_2 is tangent to the B_0 curve. In this way, I_2 is the optimal Social Indifference Curve that can be realized (given that all points below the B_0 curve are unattainable). If the government chose any other combination of H and R along the B_0 curve, that point would lie along a less favourable Social Indifference Curve, and society would then be worse off. This is illustrated by point D, which like C is an efficient point, but is less preferred than C because it is on a less preferred Social Indifference Curve. Although every point along the B_0 curve represents an efficient combination of H and R, society's optimal choice is at C, where the maximum social utility, corresponding to Social Indifference Curve I_2 , would occur.

The shape of the Social Indifference Curves is not necessarily concave to the origin as depicted in Figures 2 and 3. Their shape is determined by the relative weights that society places on the increase in social harm that results from an increase in the government's incremental net revenue. Figure 4 illustrates the shape of Social Indifference Curves if society held the view that the government is corrupt and would squander every dollar of net revenue generated by gambling activity. In this case, an increase in R would be of no value to society. Social Indifference Curves would then be perfectly horizontal as only H would matter to society. Thus, a lower H is always preferred to a higher H, irrespective of the level of R.

In the highly improbable case in which society had an entirely callous disregard for the harm suffered by disordered gamblers, the shape of the Social Indifference Curves would be vertical, as illustrated in Figure 5. In this case, only R would matter, so any move rightward constitutes a better situation for society, regardless of the level of H. Of

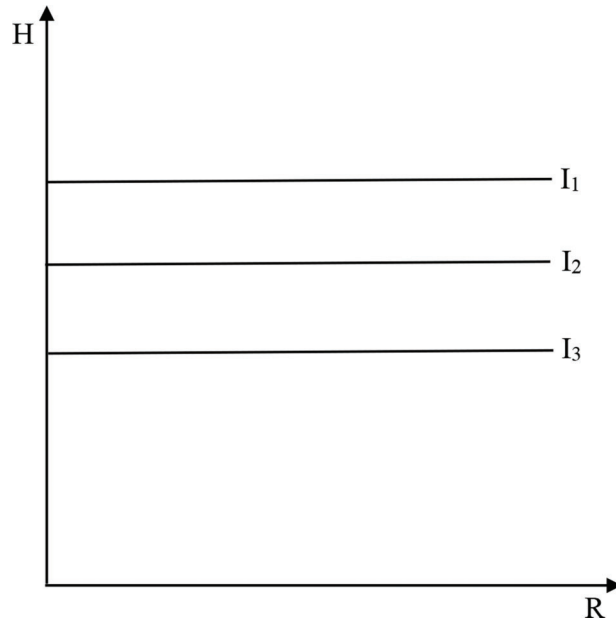


Figure 4. Three Social Indifference Curves that ascribe no social value to R; only the level of H matters to society.

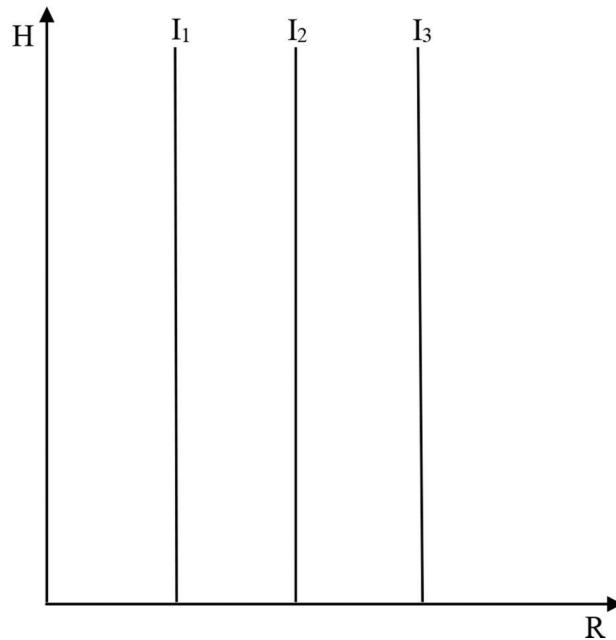


Figure 5. Three Social Indifference Curves that ascribe no social value to H; only the level of R matters to society.

course, the Social Indifference Curves having a shape that lies between these extreme cases are far more plausible and likely. The shape simply reflects society's values which, in a reasonably cohesive society, would express a social consensus.

Of course, Social Indifference Curves are a theoretical construct. When an analyst descends from the rarefied world of theory to the real world, it is admittedly impossible

for a society to determine how its members rank every possible combination of the government's incremental net revenue and the harm inflicted on disordered gamblers. However, the point is that given the feasible options, *if* we could know the preferences of society at large, we could then determine the optimal feasible combination of H and R.

The Optimal Efficient Combination of H and R in the Long Run

What we have previously shown represents the optimal outcome for society in the “short run”—defined as a period of time that is insufficient to bring about any conceivable structural change in the gambling environment. The “long run” is defined—again functionally, not temporally—as a period of time that is sufficient to implement any desired change in the gambling environment (for example, altering the design of casinos or reconfiguring VLTs to provide cautionary pop-up messaging).³ Thus, in the long run, by implementing various structural measures, the government could enlarge the set of feasible outcomes, thereby shifting the B_0 curve to the right to B_1 , as in Figure 6 below.

In the long run, the set of feasible combinations of H and R has been enlarged to include all points on or above the B_1 line. The B_1 curve depicts the locus of all efficient combinations of H and R in the long run. The maximum attainable level of social welfare in the long run would occur along the B_1 curve at point E where the Social Indifference Curve I_3 is tangent to the B_1 curve. Comparing the optimal short run outcome at C with the long run outcome at E in Figure 6, society would achieve greater incremental net revenue as well as a reduction in the level of harm to disordered gamblers in the long run, as compared to the short run.

It is important to note that better results in the long run are not a foregone conclusion. If the government is incompetent or makes a misjudgment, it could end up making a long-run change that would move society to an inefficient combination of R and H. To illustrate this point, suppose the government decides to build a new casino in an area where the market for gambling products is already saturated. Because gambling consumption and H would remain constant, yet R would be reduced (the costs of the new useless casino would lower incremental net revenue), society would move from a point on the B_0 boundary to an inefficient point, even though there was the opportunity to move to the B_1 boundary. In this way, inefficiency could conceivably occur in both the long run and the short run. Just because more options are available does not necessarily mean the government will take full advantage of them for the betterment of society.

Applying the Framework to the Real World

Now that the conceptual framework for analyzing the trade-off between social harm and the government's incremental net revenue has been built, we can turn to the data

³This distinction between the short and long run stems from the work of the leading English economist of the early 20th century, Alfred Marshall.

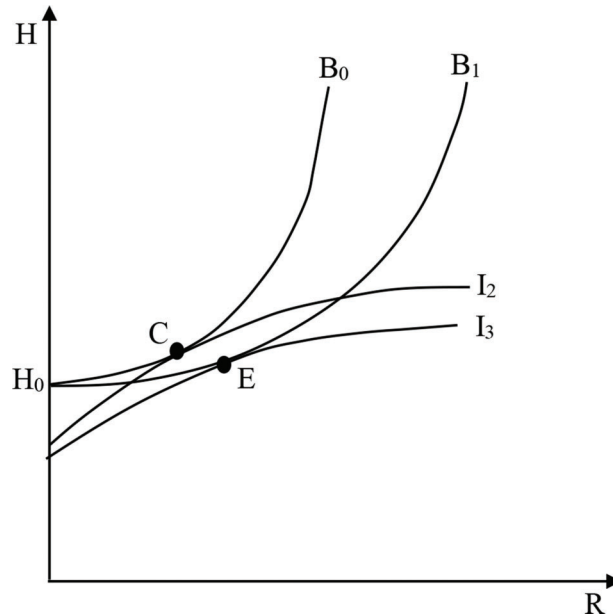


Figure 6. B_0 is the efficient boundary of R and H combinations in the short-run; B_1 is the efficient boundary of R and H combinations in the long-run. C is the optimal combination of R and H in the short-run and E is the optimal combination in the long-run.

to see how our model might appear in real life. Specifically, we will qualify the shape of the B_0 curve with evidence from the literature.

Although it is quite challenging to estimate the percentage of gambling revenue that is directly attributable to disordered⁴ gamblers, evidence does exist to suggest that this group contributes disproportionately to casino revenues (Henriksson & Lipsey, 1999, p. 265). In Alberta, excessive spending on gaming by disordered gamblers totalled \$326 million (ANIELSKI Management, 2008, p. 70).⁵ Such expenditure amounts to an extra \$2,890 in net expenditure per disordered gambler in the province (ANIELSKI, 2008, p. 69). When one considers that 3.2% of the adult population in Canada is ranked either as a moderate or severe “problem gambler” on the Canadian Problem Gambling Index (Wood & Williams, 2009, p. 7), this additional revenue becomes quite significant.⁶ Given the disparity in spending between disordered and recreational gamblers and the relatively high prevalence of the former group in Canada, one could surmise that gambling revenues are quite dependent on the losses suffered by disordered gamblers.

⁴Whereas earlier studies have used the term “problem gambler,” we have replaced this term by “disordered gambler,” in keeping with the current terminology.

⁵“Excessive spending” is defined as “the difference between the net expenditures of problem gamblers and the average net expenditures of recreational (non-problem) gamblers” (ANIELSKI, 2008, p. 69).

⁶It should be noted that the prevalence rate of disordered gambling varies quite significantly from source to source. The most recent Canadian Community Health Survey that addressed disordered gambling estimated that the prevalence rate of problem gamblers and gamblers at a moderate risk of harm from gambling was 1.1% (Statistics Canada, 2014).

Of course, the harm suffered by disordered gamblers does not take the form of their monetary losses exclusively. Many would argue that the social costs of disordered gambling are at least as severe as the financial ones. Using a “Health Utility Index” that ranged from 0 to 1, research based on Swiss data concluded that disordered gamblers scored lower than the general population by 0.12, indicating a significantly lower health-related quality of life (Kohler, 2014, p. 10).⁷ The same study also showed that disordered gamblers were more likely to be smokers, have a chronic disease or physical disability and were twice as likely to suffer from depression (Kohler, 2014, p. 10). This is in line with the data from Canada. According to the Canadian Community Health Survey microdata from 2013-2014, 17.6% of “problem gamblers” would also be considered depressed,⁸ compared with only 5.3% of the rest of the gambling population (Statistics Canada, 2014). Although the total social cost to an individual disordered gambler is difficult to ascertain, estimates (from the 1990s) range from \$13,200 to \$56,000 per person if these qualitative costs were to be put into dollar values (Henriksson & Lipsey, 1999, p. 265). Total harm is therefore much more than only the money “transferred” to the government from the losses of disordered gamblers.

How much does the tax-paying public benefit from state-sponsored gambling? Using the government’s incremental net revenue as our measure, “the ability of casinos to generate net benefits is marginal” (Henriksson, 1996, p. 117). Because most of the tax revenue collected from casinos could have been tax revenue collected from other businesses that have been pushed out by the casino, little new wealth is created for the government. New tourism generated from the opening of a casino could create wealth, but apart from the casinos in Windsor and Niagara Falls, and the gambling facilities in the Ottawa area,⁹ there is no evidence to suggest that Canadian casinos have changed tourism profits at all (Henriksson, 1996, p. 117). Thus, the profits reported by casinos and the government can be misleading in estimating the actual benefit realized by society. This does not mean the government cannot realize positive incremental net revenue from operating casinos. However, any government revenue figures that ignore the tax revenue foregone through the crowding out of local businesses by casinos are significantly overstated.

Evidence from the literature seems to suggest an unsatisfactory trade-off between revenue and harm. Revenue is dependent on harm since disordered gamblers make up such a large percentage of gambling profits, with total harm being higher than simply the money lost to the government once social costs are taken into account. In

⁷The value of the Health Utility Index was determined by an algorithm that assessed problem gamblers’ responses to two surveys, the SF-6D and the EQ-5D (Kohler, 2014, p. 6). It is beyond the scope of this paper to provide a detailed description of the construction of Kohler’s Health Utility Index.

⁸This statistic is derived from the percentage of respondents that were both flagged as “problem gambler” by the survey and had a predicted probability of depression of 90%.

⁹Although there is no proper casino in Ottawa, there is the Rideau-Carleton Raceway Casino in Gloucester, as well as Casino du Lac-Leamy in Gatineau, Quebec.

addition, since we have defined R as incremental net revenue (having deducted tax revenue foregone from other sources with the advent of government-operated gambling), the magnitude of R may be relatively insignificant. The body of research therefore suggests that the B_0 curve in our conceptual framework should be quite steep, indicating that society must endure considerable H for a very modest increase in R . Such a trade-off between H and R would be reflected by the shape of the B_0 curve depicted in Figure 7.

There are certainly parts of the B_0 curve that remain contentious. For example, although the severity of the financial and social costs are quite clear from the literature, what is unclear is what portion of these costs are attributable to legalized gambling, and if social harm from gambling and the government's incremental net revenue necessarily move in the same direction on the efficiency boundary. Figure 8 illustrates a world where harm is actually reduced by the initial entry of government as the monopoly operator of gambling, thereby displacing (or driving out) gambling operations by organized crime. This would be reflected in the portion of the B_0 curve between H_0 and F . However, beyond point F , as the government engages in marketing to promote gambling activity to realize greater profit, social harm could eventually surpass the level it was at when all gambling activity was illegal. Notice that in Figure 8, in contrast to other diagrams in which the B_0 curve is depicted, the point at which social harm is minimized is not at the intercept H_0 , but rather at F . While the entire B_0 curve in Figure 8 would delimit the boundary of feasible H and R combinations, the portion of the curve beginning at point F and to the right of F would represent the locus of efficient combinations of H and R . Figure 8 depicts a speculative B_0 curve, in the nature of a hypothesis that remains to be tested by empirical research in light of available evidence.

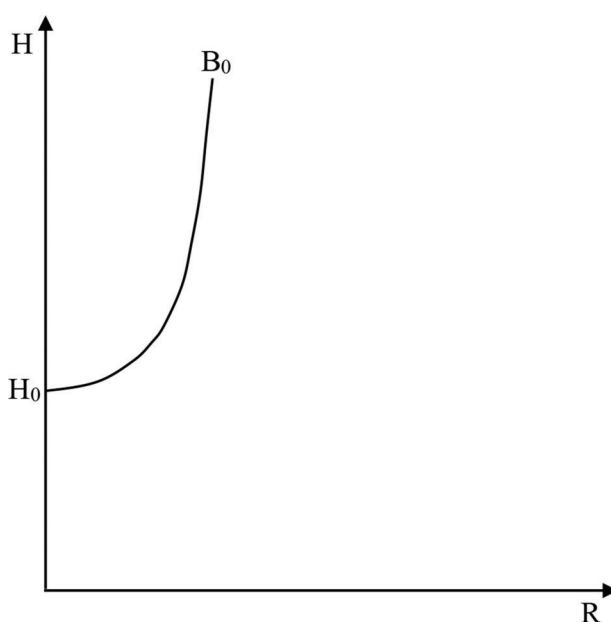


Figure 7. The efficient boundary B_0 , where the steep slope accords with empirical evidence cited in the paper.

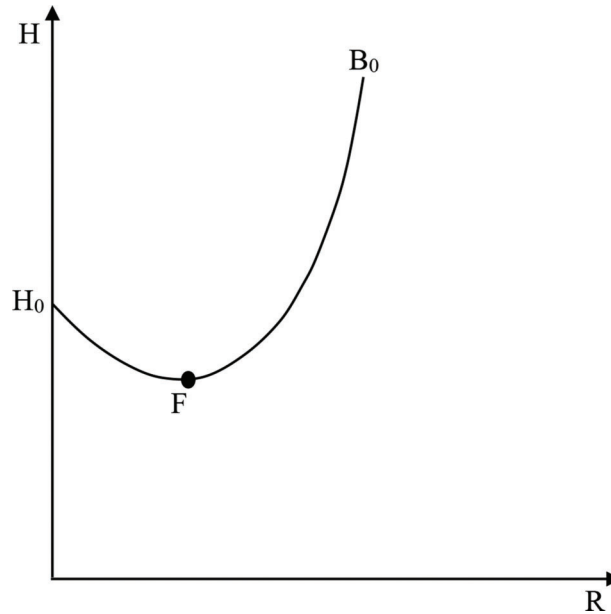


Figure 8. The efficient boundary B_0 , where the H_0 -F portion reflects a falling H as R increases. This accords with government-operated gambling displacing more harmful illegal private gambling.

Conclusion

To specify “harm minimization” as the goal of government-operated gambling is inappropriate. The goal of society should properly be stated as harm minimization for a given level of a government’s incremental net revenue realized from gambling activity, or as maximizing the level of the government’s incremental net revenue from gambling for a given level of social harm resulting from gambling activity. Either specification would imply “efficiency,” which means being on the B_0 curve in the short run and the B_1 curve in the long run. We can determine this efficient B_0 curve by examining available data to gain an understanding of the general nature of the trade-off. There is evidence to suggest that the slope is quite steep, indicating a poor trade-off between H and R . While combinations of H and R on the B_0 curve are efficient, only one point on the B_0 curve is optimal, determined by society’s preferences that are expressed by Social Indifference Curves. Whether government-operated gambling in its current form meets the standard of efficiency, let alone that of optimality, is a topic for debate. What is clear is that a conceptual framework is needed to uncover the trade-off between the social harm caused by government-operated gambling and the benefits derived from the incremental net revenue of that government.

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Hardwired for Risk: The Clinical Utility of Exploring Evolutionary Aspects of Gambling

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Introduction

Evolutionary perspectives increasingly inform the research on addiction. As this knowledge base advances, an increasing corresponding need to translate these understandings into a manner that promotes clinical innovation has consequently emerged. The purpose of this article is to provide a brief overview of emerging perspectives on evolutionary and neurobiological aspects of gambling and to consider how such perspectives can inform and enhance clinical practice.

Over the past several decades, the neurobiological understanding of substance use disorders and addictive behaviours has expanded significantly (Koob, Arends, & Le Moal, 2014; Koob & Simon, 2009). This shift has correspondingly led such bodies in the United States as the National Institute on Drug Abuse (NIDA) and the American Society of Addictive Medicine (ASAM) to emphasize the role of the brain and the effect of addictive substances on neuroanatomy and neurophysiology. These brain changes and their behavioural consequences are especially noticeable concerning the role of motivation and reward (ASAM, 2011; NIDA, 2016).

The primary brain circuitry indicated in addiction is the limbic system. This system is generally responsible for regulating drives, priorities towards which an organism is generally oriented because they promote survival and success. These priorities include the satisfaction of hunger and thirst, the keeping of oneself safe and alive, and the maintenance of hygiene, as well as parental commitment, social affiliation, and reproduction. In the middle of the limbic system is the reward pathway, made up primarily of the ventral tegmental area (VTA) and the nucleus accumbens (NAc). The reward pathway is also referred to as a motivational or *wanting system* because it encourages seeking out biological priorities. This area is rich in receptor sites for the neurotransmitter dopamine, which plays a key role in reinforcement. When the organism moves towards something seen as a priority or satisfies a drive, the reward circuitry comes alive with dopamine, producing a reinforcing experience. This not

only provides an incentive for the current behaviour, but also encourages further repetition of the behaviour in the future (Chambers, 2018; Erickson, 2018).

From an evolutionary perspective, this brain circuitry encourages adaptation by rewarding an organism for engaging in behaviours that help it to adapt, survive and thrive. Unfortunately the drugs of addiction all act upon this reward pathway, generating a degree of motivation and reinforcement that far surpasses that experienced by normal reinforcers. The motivation to seek out the addictive substance starts to become the main priority of the system, overtaking the other drives in its priority ranking. The commandeering of the brain's priority and reward circuitry, necessary for promoting the survival and success of both individual organisms and the species, by the drugs of addiction, has led to the development of an evolutionary explanation for addictions (Durrant, Adamson, Todd, & Sellman, 2009).

Evolutionary perspectives on gambling

This exploration into neurobiological and evolutionary aspects of addiction has now also expanded to include consideration of the process addictions, most notably gambling. The expanding understanding of gambling as an addiction led to its renaming as Gambling Disorder in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013)*. The *DSM-5* also now classifies Gambling Disorder alongside the substance use disorders in the newly renamed section of *Substance-Related and Addictive Disorders (APA, 2013)*. Investigators have discovered similar neurobiological characteristics, including common brain regions, circuitry and neurochemical dysregulations implicated for both the drug-based and process addictions generally (Leeman & Potenza, 2013), and for gambling addiction specifically (Clark et al., 2013). Recent neuroimaging demonstrates that the same meso-limbic brain regions and areas of the reward pathway active for individuals addicted to alcohol and other drugs (especially concerning the experience of craving and reactivity to cues) are active in those persons with an addiction to gambling. This further supports the neurobiological conceptualization of Gambling Disorder as an addiction (Limbrick-Oldfield et al., 2017).

Given the activation of the same brain regions and pathways implicated from an evolutionary perspective in biological drives and priorities promoting survival and success by both gambling and the ingesting addictions, it is easy to question how, from an evolutionary viewpoint, gambling could contribute to the survival and success of a species. To date, Anselme and associates have offered the most specific evolutionary explanations for gambling behaviour (Anselme, 2013; Anselme & Robinson, 2013). These explanations emphasize the role of dopamine, the reward pathway, and their connection to the evolutionary development of foraging and survival strategies that favour a sense of risk.

The compensatory hypothesis suggests that in response to limited, uncertain resources and environments beyond the ability of the organism to predict or control

that it is evolutionary adaptive to encourage, favour and reward seemingly low probability foraging strategies (i.e., taking risks) with high potentials for payoff. Strengthening these connections are findings that unpredictable reinforcement and experiencing losses, especially ones that appear close in proximity to wins (i.e., near misses) seem to be powerful motivators for behaviour, and at times are even more motivating than wins. This process of being motivated more by unpredictable reinforcement and losses in the form of near misses than by payoff has led to the suggestion that gambling behaviour resembles the foraging strategies suggested by the compensatory hypothesis (Anselme, 2013; Anselme & Robinson, 2013).

While most assume that money and winnings solely drive gambling behaviour (consistent with a learning model of gambling that emphasizes respondent and operant conditioning, especially intermittent reinforcement), researchers have found that problem gamblers, especially when compared to non-problem gamblers, show an increased reward response in the brain to staying in contact with the process of uncertain payoff and potential loss. This act of staying engaged in the act of unpredictable payoff (i.e., “foraging”) appears in addition to the payoff of winning (i.e., reinforcement) to be a primary motivator for problem gamblers. Certain researchers suggest that this sustained engagement in the act might provide more reinforcement for problem gamblers than even winning does, especially given observations that those with Gambling Disorder can become depressed or aggressive once they actually finally do win (Anselme, 2013; Anselme & Robinson, 2013).

Treatment implications

Understanding the role of evolutionary influences on behaviour offers an ever-growing clinical applicability. While therapeutic responses validating client feelings and experiences have always been an important clinical skill, they have received increased attention in the past several years. This change is especially true for approaches emerging from the cognitive-behavioural tradition that are now commonly referred to as the third-wave contextual behaviour therapies, including Dialectical Behavior Therapy (DBT), Acceptance and Commitment Therapy (ACT), and Compassion-Focused Therapy (CFT), among others. In addition to traditional cognitive and behavioural techniques they also emphasize interventions focused on mindfulness, acceptance, and values-based behaviour change. These approaches are increasingly utilized in the treatment of addictive disorders (Hayes & Levin, 2012), including gambling (Toneatto, 2012).

DBT makes validation an essential part of the clinical interaction and encourages clinicians to acknowledge the adaptive intent and function of certain behaviours in which the person engages to cope, even if these strategies ultimately do not or no longer serve the person well, such as engaging in substance use or addictive behaviours. DBT-informed clinicians assume that clients are genuinely attempting to address and alleviate their distress, and that for now clients are doing the best they can with what they have and with what they know (Linehan, 1993; Van Dijk, 2012).

ACT also emphasizes recognizing the reasonable and understandable nature of many behaviours, such as drastic and inflexible attempts to escape and avoid unwanted outer and inner experiences, while also exploring how such strategies ultimately are not workable and do not move one towards what they truly value in life (Hayes, Strosahl, & Wilson, 2012).

Of these approaches, CFT has most specifically placed an intentional emphasis on reducing or eliminating shame through addressing the evolutionary role of certain regulatory systems on behaviour, including ones that facilitate protective, soothing, and social affiliative responses. This is especially true for what CFT refers to as the drive system, which energizes the person to anticipate and seek out needed and desired resources. This system also plays a role in the experience of pleasure and gratification (Gilbert, 2009, 2017).

CFT emphasizes the role of the brain in guiding behaviour and that that these various regulatory systems have certain default wiring passed down through heredity and evolution, processes over which the individual had little say or control. This view, however, neither excuses harmful behaviours nor suggests that people are incapable of controlling, affecting or modifying these processes. Instead, CFT suggests that emphasizing the inherited role of these tendencies helps clients to see that they did not necessarily choose these reactions and that they share them with a common human family. This process helps to decrease shame and personalization so that one can successfully develop more adaptive coping strategies so that they might be able to address issues more effectively and productively (Gilbert, 2009; Kolts, 2016).

Many individuals struggling with addiction often wonder how their use and behaviour could have become so unmanageable. They experience a great deal of shame for seemingly allowing it to do so and see this as evidence that they are somehow inherently broken, weak or bad. Clinicians serving individuals with gambling disorder can utilize psychoeducation and validation skills, especially guided by an evolutionary perspective, to universalize the appeal of gambling behaviour. The clinicians can highlight the link to inherited foraging strategies that create tendencies that the person did not choose and over which they have little control. This evolutionary perspective normalizes the nature of taking risks and how doing so helped early humans to survive and thrive. While these tendencies might be default settings, default does not mean destiny. Clinicians working from a CBT perspective generally and utilizing CFT specifically can help individuals manage their struggles by encouraging the development of mindfulness skills, compassionate imagery and other relaxation and soothing strategies to reduce arousal and increase a sense of contentment, safety and supportive connection to others (Gilbert, 2009, 2017). While CFT and related third-wave approaches offer promise to the treatment of problematic gambling, more work needs to be done on more specifically developing and adapting these models to gambling and on integrating these approaches and skills into already established treatment protocols for Gambling Disorder.

Conclusion

The evolutionary perspective is enhancing the understanding of addiction, including gambling. This increased understanding can better inform and educate individuals struggling with gambling, and therapeutic modalities that utilize an evolutionary perspective, such as CFT, can offer new treatment possibilities. The clinical implications of an evolutionary understanding of gambling are that it can help both clinicians and clients to see that, while taking risks can be, from an evolutionary perspective, necessary and beneficial, this adaptive strategy can also work to create significant problems. Such a view allows clients both to understand better and validate this dynamic while also developing new skills and strategies managing their behaviour. The hope is that coming to see and appreciate increasingly the influence of evolution on gambling will help those persons suffering to reduce their sense of shame and recover from their struggles.

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