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A Cross-Cultural Study of Gambling Behaviour Among Adolescents

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Abstract This study investigated whether the prevalence of weekly and problem gambling among youth varied according to cultural affiliation. A convenience sample of 1,265 Quebec high school students aged 12–18 was divided into three linguistic groupings: Anglophone (English), Francophone (French), and Allophone (other). Results revealed that the Allophone grouping contained the highest proportion of youth who gambled on a weekly basis and who reported gambling problems, followed by the Anglophone, and finally the Francophone groupings. Acculturation difficulties were associated with problem gambling. Few meaningful between-group differences were found with respect to factors related to problem gambling (i.e., comorbidity with other risk factors, coping, family functioning and resiliency). The results are discussed with respect to the influence of cultural background on gambling behavior.

Introduction

While the development of severe gambling problems affects only a small minority of individuals, the negative consequences are usually severe, with interpersonal, familial, economic, psychological and legal problems. Yet despite the hazards associated with problem gambling, it remains deeply enmeshed as a socially acceptable form of entertainment, often romanticized in popular culture, television and movies. Given this context, it is imperative to understand which factors distinguish problem gamblers from social gamblers in an effort to help develop more effective prevention programs, treatment efforts, and for informing legislators attempting to develop responsible social policies (Derevensky, Gupta, Messerlian, &

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Gillespie, 2004). Given that the prevalence rates of gambling and problem gambling have been reported to vary appreciably across populations and some cultural ethnic minority groups, one factor worthy of further investigation is cultural affiliation (National Research Council, 1999; Raylu & Oei, 2004; Wardman, el Guebaly, & Hodgins, 2001).

A handful of studies examining gambling behaviour within a youth population found that members of certain minority groups were more likely to gamble and exhibit gambling-related problems. Wallisch (1993, 1996) observed adolescent problem gamblers to be more prevalent among minority ethnic groups, including Hispanics. Zitzow (1996), in a study of Native American adolescents, reported that 9.6% of their sample met the South Oaks Gambling Screen criteria for pathological gambling, a prevalence rate that was significantly higher than the 5.6% reported for non-native adolescents. In the same study, Native Americans were also found to gamble more frequently and start at an earlier age. Similarly, Stinchfield (2000) reported that approximately 10% of African-American, American Indian, and Mexican American youth gambled daily, compared to only 4% of Caucasian and 5% of Asian American youth. However, discrepant findings have also been reported. Examining the pathological gambling rates of a sample of nearly 10,000 school children, Fisher (1999) in the United Kingdom failed to find significant differences between the 88% of the sample who were white and the 12% of mixed or other ethnic origin. Similarly, in a study of college students (17–22 year olds), ethnicity did not significantly improve a prediction model for problem gambling (Nower, Derevensky, & Gupta, 2004). It is probable that different ethnic minority and cultural groups are not equally affected by issues related to problem gambling, a reasoning which would explain why some studies failed to find cultural differences in the rate of youth problem gamblers (Derevensky, Gupta, & Winters, 2003).

As is the case with all cross-cultural research, interpreting findings is complicated by the fact that numerous confounding factors may offer an alternative explanation for differences between cultural groups. For example, ethnic minorities and immigrants are more likely to experience economic hardships and have lower levels of educational attainment. Finally, even after confounding factors have been sufficiently controlled, there remains the issue of whether differences in problem gambling rates are related to values, beliefs, or some other factor inherent to the groups being studied, or whether they are due to inter-cultural factors (e.g. racism, acculturation, migration). In a review of cross-cultural studies examining adult gambling, Raylu and Oei (2004) postulated three interrelated categories of cultural factors that may influence pathological gambling. First, cultures that approve of or endorse gambling tend to have higher rates of pathological gambling. They also suggest that that immigrants or minorities who experience acculturation difficulties might be susceptible to pathological gambling. Finally, individuals from minority groups are often less likely to seek professional help, thus the untreated problem gambler risks having more problems. Nevertheless, theoretical models are lacking in this area (Garner, 2000).

From a cross-cultural research standpoint the situation in Quebec is interesting in that there are two large cultural groups of comparable socio-economic status with similar education and social service systems. However, there are marked cultural differences between Anglophone (English) and Francophone (French) Quebecers which go beyond linguistic differences (Meisel, Rocher, & Silver, 1999; Stebbins, 2000). Most French-Quebecers share a common origin, having emigrated from

France several centuries ago, and identify strongly with their Quebec heritage. They are largely of Roman Catholic faith, and tend to prefer music, television and movies that are locally produced. English Quebecers tend to form a more heterogeneous group with respect to origin and are more likely to identify with being Canadian. They are mostly of Protestant faith, and tend to follow the prevailing trends of an English popular culture dominated by American and British influences. Finally, a rapidly expanding subset of the Quebec population (referred to as Allophones) have a strong cultural heritage other than French and English. They generally speak another language at home, and adhere to different customs and cultural identities. In addition to being influenced by their own cultural origins, they may identify with Francophone, Anglophone, or both cultures.

Gambling is somewhat omnipresent and accessible in Quebec. Advertisements for lotteries and casinos are commonplace, and Video Lottery Terminals (VLTs; electronic gambling machines) are found in most establishments with a liquor licence. Although most forms of state-regulated gambling are restricted to adults only (18 years of age), most youth in Quebec gamble for money, and some develop gambling problems (Chevalier, Deguire, Gupta, & Derevensky, 2002).

It has been suggested that approximately 10–15% of youth are at-risk of developing a severe gambling problem, and 4–6% meet the diagnostic criteria for pathological gambling (Derevensky & Gupta, 2004; Jacobs, 2004). The prevalence rates of problem and pathological gambling in Quebec have been a matter of considerable debate and conflicting findings. While Ladouceur et al. (2000) have argued that children, adolescents and adults often misinterpret items on gambling screens and as such produce over-inflated rates of problem gambling, Derevensky et al. (2003) provide salient arguments as to the legitimacy of the internationally reported adolescent prevalence rates of problem and pathological gambling.

In a province-wide inquiry of high school students, the rate of probable pathological gamblers and at-risk gamblers was estimated to be 2.3% and 4.8%, respectively, using the DSM-IV-J (Chevalier et al., 2002). This measure is thought to be more conservative than the SOGS-RA (Derevensky & Gupta, 2000). Chevalier and his colleagues (2002) also reported that youth who speak a language other than French at home (Anglophones and Allophones) were more likely than Francophone youth to be either at-risk or pathological gamblers (combined percentage of 10.1%, compared to 6.5%, respectively) and to gamble on a weekly basis (11% compared to 8%, respectively). However, an earlier province-wide study revealed no differences between Francophones and Anglophones/Allophones, either in the proportion of youth who gamble on a weekly basis, or in the percentage of pathological gamblers (Chevalier, Allard, & Audet, 2000). The authors did report more variation in the problem gambling rates for non-Francophone youth, suggesting that the amalgamation of all minorities into one category might have veiled significant differences between Francophones and specific ethnic minority groups. Chevalier (personal communication, July 12, 2005) noted that the gambling measures used in the two studies were also different and he hypothesized that a recently implemented gambling prevention program may have had a greater impact upon Francophone adolescents than on Anglophone and Allophone youth. In contrast to these surveys, several smaller studies involving primarily Anglophone and Allophone Quebec youth reported relatively high rates of probable pathological gambling (4.5% in Ste-Marie, Gupta, & Derevensky's, 2002 study and 4.7% by Gupta & Derevensky, 1998). It is important to note that these studies drew their participants primarily

from English schools, while the province-wide studies involved a higher proportion of students attending French schools.

In summary, there is ample reason to speculate that the prevalence of youth with gambling problems may be markedly different for Francophones, Anglophones and Allophones in Quebec, highlighting not only the cultural diversity but cultural differences with respect to overall gambling behaviour and problem gambling behaviours.

Using data from a larger study concerning the relationship between problem gambling and resiliency/vulnerability factors (Lussier, Derevensky, & Gupta, 2004), the present study examined gambling behaviours amongst adolescents from different cultural and linguistic backgrounds. The objective of the study was to determine whether there were differences in the rates of gambling and problem gambling between Francophone, Anglophone and Allophone adolescents and possible reasons that may account for differences. To achieve this objective, measures included indices of acculturation, resiliency, coping, a number of risk factors, and perceived family functioning. The knowledge of whether adolescents within specific cultures are differentially affected by gambling problems may prove useful in the planning of prevention and treatment strategies. Furthermore, researching how and why cultural groups differ in the frequency of participation in gambling activities and the rates of pathological gambling may provide valuable clues to understanding the aetiology of this disorder and help in explaining divergent prevalence rates reported in the literature.

Method

Participants

The overall convenience sample consisted of 1,265 high school students (605 males, 660 females); 96 participants were excluded because their responses were illegible, patterned, or of suspect validity, as well as eight participants whose gender was not specified. Individuals were selected from 12 high schools located in the Greater Montreal region. Ages ranged from 12 to 18 ($M = 14.9$). Given that linguistic groups could not reasonably be divided by language spoken at home (60.9% reported speaking both), participants were considered Anglophone or Francophone if they attended an English or French school, respectively, and did not speak a third language at home while Allophones were identified by speaking a third language at home. As provincial laws determine the language of schooling, it is important to note that Allophones attend both French and English language schools. For the purposes of this study, Allophones from French and English schools were combined due to small group sizes. The sample for analysis consisted of 298 Francophones (141 males, 157 females), 404 Anglophones (192 males, 212 females), and 563 Allophones (272 males, 291 females). Partly because some of the English schools involved in the study included grades 7 and 8 and the French schools did not, significant age differences were found ($F(2,1264) = 62.46$, $p < .001$). A Tukey post hoc analysis revealed that the mean ages of the three groups were statistically significantly different from one another; Francophone ($M = 15.68$), Anglophone ($M = 14.38$) and Allophone ($M = 14.86$). While developmental differences were minor, to maintain the integrity

of the results analyses controlling for age were performed when appropriate. No age by gender interaction effects were found.

In a recent survey, Cowley and Marceau (2000) provided estimates of the mean family income for each high school in Quebec. They also reported on a school by school basis, a socioeconomic status (SES) indicator which corresponds to number of standard deviations above or below the median SES for the province. Using the information provided, the mean SES of the students participating in the present study was estimated to be 0.32 standard deviations above the provincial average. The mean SES for the English schools (M = +0.41) was statistically higher than the mean for the French schools (M = + 0.15) (t = 18.36, p < .001).

Instruments

All the measures used were originally in English. The questionnaire was translated from English to French by a translator, and verified by two bilingual graduate students.

Gambling Measures

The DSM-IV-MR-J (Fisher, 2000) is a revised version of the DSM-IV-J (Fisher, 1992). This screen for problem gambling behaviour was adapted from the adult DSM-IV (APA, 1994). It contains 12 questions, and is divided into nine categories; progression (spending more money than intended), preoccupation, tolerance, withdrawal symptoms, escape, chasing losses, lying to family, school-related or other disruptions, and stealing money for the purposes of gambling. For most questions, respondents choose between four levels of severity: never, once or twice, sometimes or often. In calculating level of risk for problem gambling, subjects receive either one or no points for each of the nine categories depending upon endorsement and frequency of the item. The DSM-IV-MR-J represents a conservative screen in that various questions require an endorsement above a certain criterion level to be counted toward severity. A total score of 0–1 is indicative of a social gambler, 2–3 denotes an at-risk gambler, and 4–9 indicates a probable pathological gambler (PPG). The Cronbach α for the sample was .79.

A portion of the Gambling Activities Questionnaire (GAQ; Gupta & Derevensky, 1996) was used to provide information about the frequency and types of gambling in which adolescents participate. Respondents who indicated never having participated in any form of gambling were considered non-gamblers. This instrument is reported to have good face validity.

Risk and Protective Factors

The Individual Protective Factors Index (IPFI; Springer & Phillips, 1992) is a 71-item standardized assessment of adolescent resiliency. It examines 11 factors associated with a healthy personal and social development among youth who live in high-risk environments. These factors include: adherence to pro-social norms, school bonding, family bonding, self-concept, self-control, self-efficacy, positive outlook, assertiveness, confidence, cooperation, and attitude towards alcohol or drugs. The respondents answer on a 4-point Likert scale. The scores are totalled and divided by the number of questions, such that a mean score for the index and each subscale is

calculated. Mean scores range from one to four; a high score indicates high resiliency. Springer and Phillips reported a Cronbach alpha of .93, as did the present study.

The EMT Risk Measures is an addendum to the IPFI measure. While the EMT has not been standardized, it has demonstrated good internal consistency (α = .91) in the current study. The measure contains 39 questions assessing eight risk factors associated with the development of problems in later life: lack of family supervision, limited family interaction, lack of positive peer associations, engagement in risk behaviours, alcohol or drug (AOD) use, peer AOD use, other exposure to AOD use, and neighbourhood disorganization. The scale is calculated in a similar manner as the IPFI; a high score indicating reduced risk.

Family Functioning

The Family Adaptability and Cohesion Scales (FACES II; Olson, Portner, & Bell, 1983) contains 30 items measuring the degree to which a youth's family engages in communal activities, and resolves problems collectively. There has been some debate as to whether these measures share a linear or curvilinear relationship to family well-being, but the bulk of comparisons with other measures suggest a linear one (Hampton, Hulgus, & Beavers, 1991). Respondents select among five possible answers: almost never, once in a while, sometimes, frequently, and almost always. Both cohesion (α = .85) and adaptability (α = .84) scales showed good internal consistency.

Coping

The Coping Inventory for Stressful Situations (CISS-adolescence; Endler & Parker, 1990a, b) contains 48 items assessing the degree to which adolescents exhibit the following response patterns to stressful situations: tackling problem in an organized task-oriented manner (α = .90), getting emotional (α = .85), and avoidance (α = .83), which is further divided into two subscales, seeking distraction (α = .75) and social diversions (α = .77). The scales have shown strong validity and test-retest reliability (Nower et al., 2004).

Procedure

Formal requests to conduct research were sent to several school boards in the Greater Montreal area. Four school boards agreed and allowed the researchers to contact high schools principals. Questionnaires were completed in class or in the cafeteria during school hours. Students were given 50 min to complete the 300-item questionnaire, but additional time was granted when required. All participation was voluntary and anonymous. Questionnaires were then coded by the research staff and scanned using Optical Remark Recognition software.

Analytical Strategy

Composite scores were not calculated if more than 15% of the items were missing. Otherwise, the mean score of the item was imputed if the scale was continuous, and the most frequent score was imputed if the scale was ordinal. Because a 15%

threshold for the DSM-IV-MR-J would have eliminated problem gamblers from the study, this scale was calculated for all but four subjects who were missing five or more items.

Using SPSS software, one-way ANOVAs and Chi Square analyses were employed for univariate comparisons of cultural groupings. The post-hoc tests selected for the ANOVAs were the Tukey test if equal variance was assumed and the Games-Howell test if it was not. For significant Chi Square results, subsequent 2×2 Chi Square analyses were performed comparing the prevalence rate for each individual category to the mean rate of the other categories (e.g., Anglophone Social Gamblers were compared to non-Anglophone Social gamblers).

Sequential binary logistic regressions were then carried out to examine (a) the relative effect of culture on gambling after controlling for the effects of gender, age and selected predictors of problem gambling, namely resiliency, risk, coping style and family cohesion/adaptability, and (b) possible interaction effects between culture and the other variables. The outcome variable was coded as $0 =$ non-gambler or social gambler and $1 =$ at-risk or probable pathological gambler. Age, gender and all predictor variables except culture were entered in the first step; cultural identity ($0 =$ Francophone, $1 =$ Anglophone and $2 =$ Allophone) was entered in the second step, and all possible interaction effects between culture and the other variables were entered in the third step. A final regression analysis with all non-significant predictors (variables and interactions) excluded from the model, was then conducted.

Results

Cultural Differences in Gambling Behaviour

The differences between cultural groups in terms of gambling frequency and risk category are presented in Tables 1 and 2. The measure of strength of association (φ coefficient) presented in these tables however should be interpreted with caution, as much of the data diverges greatly from a 50/50 split. Trusty, Thompson, and Petrocelli (2004) warn that skewed distributions of categorical variables can

Table 1 Comparison of cultural groupings by gambling frequency and risk category—boys

	Francophone, $N = 141$ % (φ)	Anglophone, $N = 192$ % (φ)	Anglophone, $N = 270$ % (φ)	Total, $N = 605$
Gambling frequency				
Never ($N = 102$)	24.1* (.107)	17.8 (.015)	12.5* (.105)	16.9
Less than monthly ($N = 195$)	39.0* (.080)	38.0* (.084)	24.6* (.147)	32.2
1–3 times a month ($N = 148$)	24.1 (.004)	24.5 (.000)	24.6 (.004)	24.5
Weekly or more ($N = 160$)	12.8* (.171)	19.8* (.103)	38.2* (.242)	26.4
Gambling risk level				
Non-gambler ($N = 102$)	24.1* (.107)	17.8 (.015)	12.6* (.105)	16.9
Social gambler ($N = 413$)	71.6 (.037)	72.3 (.057)	63.9* (.086)	68.5
At-Risk ($N = 58$)	4.3* (.101)	4.7* (.114)	16.0* (.193)	9.6
Probable pathological ($N = 30$)	0* (.127)	5.2 (.008)	7.4* (.101)	5.0

Note: Percentages and (φ coefficients (in brackets) are presented

* The prevalence rate of that cultural group is significantly different ($p < .05$, two-tailed) from the mean rate of the other two cultural groups for that value

Table 2 Comparison of cultural groupings by gambling frequency and risk category—girls

	Francophone, N = 157 % (φ)	Anglophone, N = 212 % (φ)	Anglophone, N = 291 % (φ)	Total, N = 660
Gambling frequency				
Never (N = 139)	24.2 (.043)	24.1 (.051)	17.2* (.084)	21.1
Less than monthly (N = 299)	44.6 (.008)	44.3 (.013)	46.4 (.019)	45.3
1–3 times a month (N = 139)	22.9 (.026)	19.8 (.021)	21.0 (.002)	21.1
Weekly or more (N = 83)	8.3 (.072)	11.8 (.016)	15.5* (.077)	12.6
Gambling risk level				
Non-gambler (N = 139)	24.2 (.043)	24.1 (.051)	17.2* (.084)	21.1
Social gambler (N = 487)	74.5 (.009)	70.3 (.055)	75.9 (.044)	73.8
At-Risk (N = 25)	0* (.111)	4.7 (.033)	5.2 (.064)	3.8
Probable Pathological (N = 9)	1.3 (.004)	0.9 (.025)	1.7 (.027)	1.4

Note: Percentages and (φ coefficients (in brackets) are presented

* The prevalence rate of that cultural group is significantly different ($p < .05$, two-tailed) from the mean rate of the other two cultural groups for that value

especially limit the magnitude of variance-accounted-for effect sizes For example, a low strength of association was found between being Non-Francophone and a PPG ($\varphi = .127$), even though it was the highest possible association (i.e., all PPGs were Non-Francophone), given the skewed nature of the data.

Francophone youth gambled less frequently and had fewer gambling problems. Lower proportions of PPGs, $\chi(1, 601) = 9.68$, $p = .002$; At-Risk gamblers, $\chi(1, 601) = 6.15$, $p = .013$; and weekly gamblers, $\chi(1, 605) = 17.69$, $p < .0005$) were found among Francophone boys. A lower proportion of Francophone girls were classified as At-Risk gamblers, $\chi(1, 660) = 8.1$, $p = .004$. Allophone boys appear to be at greatest risk for gambling problems, as there were higher proportions of PPGs, $\chi(1, 601) = 6.13$, $p = .013$; At-Risk gamblers, $\chi(1, 601) = 22.41$, $p < .0005$; and weekly gamblers, $\chi(1, 605) = 35.31$, $p < .0005$. A higher proportion of Allophone girls were found to be weekly gamblers, $\chi(1, 660) = 3.95$, $p = .047$. The risk level of Anglophones generally fell between that of the other two groups. However, it is important to note that this grouping contained almost as many PPGs as the Allophones, yet had half as many weekly gamblers, $\chi(1, 605) = 6.40$, $p = .011$. In this respect, Anglophone boys demonstrated the greatest vulnerability to severe gambling problems. The percentage of boys and girls from the three cultural groupings who participated in various types of gambling at least once a month is presented in Table 3. Among the three groupings, Allophone boys demonstrated the highest involvement in almost all forms of gambling, including those most associated with pathological gambling, such as VLTs, slot machines and casino type games (Chevalier & Allard, 2001). Few between group differences were found for girls. Finally, both Allophone boys and girls are more likely to engage in two or more type of gambling on a monthly basis.

Since Francophone students were on average older, the same analyses were performed on a subsample consisting of 16-year old boys and girls only; this age being selected because it represented the largest group sizes. After 14 males were randomly deleted from the minority group, each group consisted of 54% females and 46% males. Consistent with the previous comparisons, cultural groupings were significantly different with respect to problem gambling (the at-risk and probable pathological gambler categories were combined, as were the social and non-gambler categories),

Table 3 Comparison of cultural groupings by participation in different types of gambling

	Boys			Girls		
	Franco	Anglo	Allophone	Franco	Anglo	Allophone
Cards	12.8	20.9	37.1***	13.4	14.2	18.9
Sports pools	9.9	16.7	23.2**	3.2	8.1	9.3
Sports lottery	2.8	3.1	10.0**	0.6	1.4	3.8
Lottery	5.7	5.8	11.9*	10.8	11.8	9.0
Video games	6.4	8.4	12.5	1.3	1.9	2.1
VLTs	0.7	1.0	6.7***	0	0.9	2.8
Bingo	0.7	2.6	3.7	3.2	2.8	4.8
Slot Machines	2.1	0	7.4***	0.6	2.4	3.4
Sports/games played	7.1	13.0	23.0***	1.9	3.3	7.6*
Race track	0	0.5	2.2	0.6	0	2.1
Casino-type games	0.7	3.6	8.5**	0.6	0.9	3.8*
Internet	1.4	1.0	4.0	0.6	0	0.7
2+ gambling types	12.8	20.3	33.3***	7.6	12.3	16.2*

Note: Presented is the percentage of respondents who participate once a month or more in the gambling activity. Asterisks indicate that the participation rate of that cultural group is significantly different from the mean rate of the other two cultural groups

* $p < .05$; ** $p < .01$; *** $p < .0005$

$\chi(2, 321) = 12.89$, $p = .002$, and gambling frequency, $\chi(5, 321) = 19.29$, $p = .004$. Allophones had the highest proportions of problem gamblers and weekly gamblers. Monthly participation in different types of gambling was also tested. Gambling on VLT machines, the Internet, bingo, slot machines, animal races and casino type games were not tested because more than 20% of cells had an expected count of less than five. Of the six types of gambling for which statistical comparisons are possible, four showed significant group differences; these were card playing, $\chi(2, 321) = 9.34$, $p = .009$, sports pools, $\chi(2, 321) = 13.94$, $p = .001$, sports lotteries, $\chi(2, 320) = 9.65$, $p = .008$ and wagering on sports and games played, $\chi(2, 321) = 11.21$, $p = .004$. Allophones showed the highest participation rates, and were more likely to engage in two or more types of gambling, $\chi(2, 321) = 13.18$, $p = .001$. No significant differences were found for lottery playing and gambling on video games.

Unfortunately, the number of participants in each linguistic minority group was insufficient to permit more accurate estimations of their gambling behaviour. However, the prevalence rates of problem gambling for the largest groups are presented for information purposes. The largest minority group for boys was Italian ($N = 102$; 17.6% At-Risk, 8.8% PPG), followed by Hispanic ($N = 46$; 8.7% At-Risk, 8.7% PPG), East Asian ($N = 36$; 11.1% At-Risk, 8.3% PPG), and Portuguese-speaking youth ($N = 25$; 8.0% At-Risk, 0% PPG). The largest minority group for girls was also Italian ($N = 97$; 8.7% At-Risk, 1.0% PPG), followed by Hispanic ($N = 61$; 4.9% At-Risk, 1.6% PPG), East Asian ($N = 32$; 9.4% At-Risk, 0% PPG), and Portuguese-speaking youth ($N = 24$; 8.3% At-Risk, 0% PPG). Based upon these results, the high prevalence of gambling problems found among Allophone boys appears to be attributable to several linguistic minority groups.

Cultural Differences in Factors Associated with Problem Gambling

Because of the numerous unplanned comparisons made in this section, the probability level was lowered to $p \leq .001$. This adjustment was not applied to the test

concerning acculturation difficulties, which was a planned comparison. More similarities than differences were found between cultural groups with respect to family functioning, coping, risk factors, and resiliency. For example, no statistically significant between-group differences were found for the two dimensions of family functioning scales and the five coping strategies. Allophones boys scored lower than the non-minority groupings in family bonding, $F(2, 597) = 6.78$, $p = .001$; and lower than Anglophones on commitment to pro-social norms, $F(2, 599) = 6.94$ $p = .001$; as assessed by the IPFI scale. When the comparison was limited to 16-year old boys and girls, Allophones scored lower than Francophones in family bonding, and both Allophones and Anglophones scored lower than Francophones in commitment to pro-social norms.

Oddly enough, Francophone youth had lower pathological gambling rates, yet reported a higher risk profile with respect to several risk and resiliency measures that are usually associated with PPGs. Both Francophone boys, $F(2, 578) = 11.66$, $p < .0005$; and girls, $F(2,651) = 12.65$, $p < .0005$; reported having less family supervision than the other two groups. Francophone boys also reported more peer use of alcohol and other drugs (AOD), $F(2, 567) = 18.87$, $p < .0005$; and other exposure to AOD, $F(2, 570) = 8.55$, $p < .0005$; compared to the two other groupings. Both Francophone and Allophone boys reported a higher at-risk EMT composite score, $F(2, 565) = 8.07$, $p < .0005$; more AOD use, $F(2, 570) = 8.56$, $p < .0005$; and more approving attitudes towards AOD, $F(2, 602) = 7.99$, $p < .0005$); compared to the Anglophone boys. Francophone girls differentiated themselves from both groups in that they reported more approving attitudes towards AOD, $F(2, 657) = 10.78$, $p < .0005$; more AOD use $F(2, 652) = 20.59$, $p < .0005$; a higher at-risk EMT composite score, $F(2, 640) = 15.73$, $p < .0005$; more peer AOD use, $F(2, 644) = 34.20$, $p < .0005$; and more exposure to AOD use from other sources, $F(2, 645) = 20.52$, $p < .0005$. When the comparison was limited to 16-year old boys and girls, Francophones reported less family supervision, more AOD use, more peer AOD use and more AOD use exposure than Allophones. Age differences between the linguistic groupings seemed to have caused the risk level of Anglophone youth to be underestimated.

Finally, we examined whether problem gambling amongst Allophones was associated with acculturation difficulties. Since almost twice as many males reported acculturation difficulties, gender issues were considered. A χ^2 comparing respondents with respect to whether or not they had gambling problems (At-Risk and PPGs combined) and whether or not they "had a hard time fitting in" because of their cultural background, was performed. Acculturation problems was positively associated with problem gambling for males, $\chi(1, 272) = 8.73$, $p = .003$, $\varphi = .179$. Fifty percent of those with acculturation issues also had gambling problems, compared to 21% of Allophone youth with no acculturation problems. However, it is important to note that only 5.9% of Allophones reported having acculturation problems. No significant association was found for females, using Fisher's Exact Test (one cell had an expect cell count of less than 5).

Relative Effect of Cultural Affiliation on Problem Gambling

The principal variables examined in the study (not subscales) were entered as predictors in a binary logistic regression. Gender, age, emotional reactions to stress (CISS), resiliency (IPFI), and risk (EMT) were found to contribute significantly to

Table 4 Sequential logistic regression predicting problem gamblers—final model

	Odds ratios	95% Confidence intervals	*p* Values
Step 2			
Age (age 16 and older)	.538	.338–.857	.009
Gender (male)	3.462	2.172–5.516	.0005
Emotional reaction to stress	1.028	1.005–1.051	.01
EMT Risk factor scale	.428	.272–.675	.0005
IPFI Resiliency scale	.175	.094–.326	.0005
Cultural identity			
Francophone (referent)			
Anglophone	2.329	.998–5.438	.051
Allophone	5.121	2.352–11.153	.0005
Step 3			
Anglophone × Resiliency	$\beta = 3.826, p = .023$		
Allophone × Resiliency	$\beta = 4.207, p = .011$		

Note: For both Risk and Resiliency scales, a high score indicates fewer problems

the prediction of problem gambling and were included in the final regression model. Single parent status, family functioning (FACES II), and both task-oriented and avoidance coping strategies (CISS) did not add significantly to the prediction of problem gambling, so they were excluded from the final regression model. All possible interaction terms between culture and the other variables were also entered in the initial model; only the interaction term between cultural affiliation and resiliency proved significant and was therefore entered into the final model. The Hosmer and Lemeshow test was non-significant, indicating an adequate model fit. A test for possible outliers revealed only one individual with a z-residual score above 3; this is acceptable in analyses involving a large sample size (Newton & Rudestam, 1999). The final regression model specifies the odds ratios and confidence intervals of the variables at step 2 and the β value of the interaction term at step 3 (see Table 4). Even after controlling for the relative effect of age, gender, and predictor variables, the inclusion of cultural identity improved the prediction of problem gamblers. Allophones were 5.4 times more likely than Francophone youth to possess some degree of gambling problems. In order to understand the direction of the interaction, the sample was divided in half using the median IPFI resiliency score. While problem gamblers were generally more likely to possess low scores, subsequent analysis revealed that 100% of the Francophones with gambling problems scored below the median on this resiliency scale, compared to 84% of Anglophones, and 77% of Allophones. Hence, the relationship between resiliency and problem gambling was stronger for Francophone youth than for the other groupings. However, since older youth tend to have lower resiliency scores, this interaction effect may be attributable to the Francophone grouping being older.

Discussion

Notable differences were found in the gambling behaviour of Anglophone, Francophone and Allophone youth. Taken with the results of previous studies, there is strong reason to believe that the rate of problem gambling and weekly gambling among Francophone youth is lower than that of other youth. Given that the earlier

of the two principal studies in this field (Chevalier et al., 2000) found no significant differences between Francophone and Non-Francophone youth in terms of frequent and problem gambling, one wonders whether the cultural differences in gambling behaviour may be a more recent trend amongst adolescents in Quebec. The results of the present study suggested significant differences between Anglophone and Allophone youth as well. Compared to Allophones, Anglophone boys had almost as many probable pathological gamblers, yet only half the amount of youth who gambled on a weekly basis. This may be an indication that Anglophone youth are more prone to developing gambling problems. A cautionary note should be made since each cultural grouping was represented by only a few hundred youth and all were living in the same region of the province. As such, while highlighting cultural variability the prevalence rates reported in this study should not be taken as precise prevalence estimates for the entire population. In fact, given that none of the Francophone youth met the criteria for pathological gambling, one would naturally expect the true prevalence rate for problem gambling to be somewhat higher. Further research is needed to garner precise estimates of the prevalence of problem gambling among the different cultural groups in Quebec. Nevertheless, the results of the present study are consistent with the majority of cross-cultural studies in finding that cultural factors influence gambling and problem gambling rates. They also support the conjecture of Derevensky et al. (2003) that the wide variability in prevalence rates of youth problem gambling reported in recent Quebec studies may be due to cultural and linguistic factors and not because of conceptual and methodological difficulties as suggested by Ladouceur et al. (2000). In other words, studies reporting higher general prevalence rates of problem and pathological gamblers (e.g., Derevensky & Gupta, 2000; Gupta & Derevensky, 1998) sampled a higher proportion of Allophone and Anglophone youth than Ladouceur et al. (2000) who sampled a primarily Francophone population.

Consistent with numerous studies indicating that gambling problems are more widespread among minority youth (Wallisch, 1993, 1996; Zitzow, 1996), cultural and ethnic minority individuals demonstrated the greatest risk for problem gambling. In the present sample, these were most commonly adolescents of Italian, Hispanic, Arabic, Portuguese and Chinese decent. It should also be noted that the adolescents assessed in the current study generally attended schools located in suburbs outside of the city's center; not areas where recent immigrants typically settle upon arriving in Montreal. As well, the SES of the students in the participating schools was somewhat above the provincial average, according to data from Cowley and Marceau (2000). We therefore suspect that many of the Allophone youth tested were second or third generation immigrants, or recent arrivals from a higher socio-economic class.

A compelling question remains as to why cultural differences in the rate of problem gambling actually exist given similar opportunities and possible venues. Congruent differences were found in terms of gambling frequency (i.e., Allophones gambled the most often, followed by Anglophones, then Francophones). An examination of patterns of play demonstrated that Allophones participate more regularly in several forms of gambling, including card playing and VLT and slot machine use. All of this leads us to suspect that part of the reason why Allophone, and to a lesser degree Anglophone youth, demonstrated a greater risk for gambling problems is that they participate more regularly in gambling activities generally associated with higher rates of general gambling problems (e.g., VLTs; see Chevalier & Allard, 2001). This reasoning seems more plausible than the hypothesis that

non-Francophone youth are more prone to risky behaviours. The comparison of cultural groups on risk factors associated with problem gambling revealed few indications as to why Francophone adolescents would be resistant to gambling problems. In fact, Francophone youth even scored higher than Allophone youth on two risk factors generally associated with problem gambling; low family supervision and drug use/exposure. These results raise questions as to whether the EMT scale may be appropriate for differentiating cultural differences when examining adolescent risky behaviours.

In a logistic regression, several factors thought to have a considerable effect on gambling, namely single parent status, coping, and family functioning (Dickson, Derevensky & Gupta, in press; Gupta, Derevensky, & Marget, 2004), failed to improve the prediction model. Further investigation of whether and how these factors contribute to the risk of developing a youth gambling problem is warranted. An interaction effect found between the composite IPFI scores and cultural groups suggests that the link between resiliency and problem gambling may be stronger for Francophones. Nevertheless, this remains speculative as age differences between groupings may have influenced the results.

Allophones scored lower on measures of family bonding. However, given that they did not score differently on measures of family supervision, interaction, adaptability and cohesion, there is little reason to believe that they are more prone to problem behaviour due to a lack of family attachment. One reason immigrants are thought to be more prone to gambling problems stems from the challenges faced in integrating with the mainstream culture (Raylu & Oei, 2004). In the present study, youth who indicated that they experienced acculturation difficulties were more than three times more likely to experience gambling problems. However, overall, only a small percent (5.9%) of Allophone youth reported experiencing acculturation difficulties.

This study was hindered by certain methodological difficulties. The groups were not equal with respect to age. Nevertheless, it seems unlikely that age differences distorted the main findings of this study. First, analyses limited to 16 year olds yielded the same results. Second, the logistic regression demonstrated that culture remains a significant predictor of problem gambling even after controlling for age. Unfortunately, we were unable to obtain information on the participant's race, religion, country of origin, and SES, due to ethical constraints. The accuracy of the translation into French of the questionnaire was not verified through back-translation. The generalizability of the results is possibly limited because the sample was drawn solely from public schools located in suburban neighbourhoods and may not be truly representative of the population at large. Private school students, rural students and dropouts may exhibit different gambling patterns. Finally, it is also possible that the Anglophone and Allophone communities in Quebec make up unique cultural groups in and of themselves, and may not be entirely representative of English-speaking and linguistic minority groups elsewhere. Migration patterns and bilingualism are but two factors that have been shown to distinguish these groups.

Despite these limitations, the current study adds to the growing body of evidence indicating that youth from different cultural backgrounds are not equally at risk of developing gambling problems. More importantly, the present results suggest that minority groups may be at increased risk for reasons that go beyond poverty and other disadvantages. Further research is needed to identify these reasons. One

possible explanation may be cultural differences in parental attitudes towards gambling. It would also be important to verify whether the increased rates of problem gambling among adolescents in some cultural communities lead to long-term repercussions and increase the risk of becoming an adult problem gambler.

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