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Prevalence Estimates of Gambling Participation and Problem Gambling among 16–18-year-old Students in Iceland: A Comparison of the SOGS-RA and DSM-IV-MR-J

Daniel Thor Olason
Karen Julia Sigurdardottir
Jakob Smari
University of Iceland

The aim of this study was to estimate gambling participation and problem gambling among Icelandic adolescents. Participants were 750 16–18-year-old students, 371 girls and 379 boys. The rate of problem gambling was estimated with the SOGS-RA and DSM-IV-MR-J. Results indicated that 96% of adolescents had gambled in their lifetime, 79% at least once in the preceding year and about 10% gamble at least once a week. A psychometric evaluation of the two screening scales revealed satisfactory reliabilities and factor structures for both scales. The DSM-IV-MR-J identified 2% of the participants as problem gamblers while SOGS-RA identified 2.7%, and problem gambling was more common among boys than girls. It was concluded that problem gambling among adolescents is an area of concern for the Icelandic community that needs to be further investigated.

KEY WORDS: adolescent; gambling; problem gambling; SOGS-RA; DSM-IV-MR-J.

Please address correspondence to Daniel Thor Olason. Department of Psychology, Faculty of social Sciences, University of Iceland, Oddi, Sturlugata, 101, Reykjavik, Iceland. E-mail: dto@hi.is.

INTRODUCTION

Numerous studies in North America report that between 70–90% of adolescents have gambled sometime in their lives and similar rates (60–80%) have been reported for current (preceding year) gambling participation (Derevensky & Gupta, 2000; Gupta & Derevensky, 1998; Jacobs, 2000; Ladouceur, Boudreault, Jacques, & Vitaro, 1999; NRC, 1999; Westphal, Rush, Stevens, & Johnsson, 2000). These high prevalence rates for gambling among adolescents are not exclusive to North America, as studies in Europe and Australia report similar figures for gambling participation among adolescents (Fisher, 1992, 1999; Gerdner & Svensson, 2003; Johansson & Götestam, 2003; Moore & Ohtsuka, 1999).

During the last 20 years a fairly substantial body of research on the prevalence of youth problem gambling in North America has been accumulating. A meta-analysis on published and unpublished studies on problem gambling prevalence rates in the USA and Canada from 1985 to 1994 suggested that between 4.4% and 7.4% of adolescents exhibit severe gambling problems (Shaffer & Hall, 1996). These figures have been confirmed in more recent research in both the USA and Canada (e.g., Derevensky & Gupta, 2000; Gupta & Derevensky, 1998; Westphal et al., 2000; Wiebe, Cox, & Mehmel, 2000), although lower figures have also been reported (e.g., Ladouceur et al., 1999; Poulin, 2000; Volberg, 2002).

However, research on adolescent problem gambling in Europe is scarce. A number of studies on gambling participation by youths have been conducted in Britain (Fisher, 1992, 1993, 1999; Griffiths, 1995; Orford, Sproston, Erens, White, & Mitchell, 2003; Wood & Griffiths, 1998). The study by Fisher (1999) is the latest prevalence study of adolescent problem gambling in Britain. The study was extensive and included 9774 pupils 12–15-years-old in 114 schools in England and Wales. The focus of the study was involvement in fruit machine play and the National Lottery scratch cards. Participation in these games was widespread. The prevalence of problem gambling was 5.6% as measured with the DSM-IV-MR-J screen, a figure similar to findings in earlier studies (Fisher, 1993; Wood & Griffiths, 1998). In Spain two studies were reported by Becoña (1997), which examined prevalence of problem gambling among adolescents in two cities, A Coruna and Gijón. In both studies the DSM-IV-J (Fisher, 1992, 1993) was used to

measure problem gambling and 2.2% and 1.6%, respectively were identified as problem gamblers. Finally, the results from a recent epidemiological study in Norway on 12–18-year-old youths ($N = 3237$) indicated that most adolescents in Norway gamble to some degree and about a quarter of them do so weekly (Johansson & Götestam, 2003). The overall prevalence of problem gambling (as measured by a 10-item DSM-IV screen) among Norwegian youth was relatively low compared to other studies or 1.76% (2.79% for males and 0.69% for females).

The Gambling Situation in Iceland

Gambling in Iceland was first legalized in 1933 when the University Lottery obtained permission for its operation. Until the late 1980s the gambling market was relatively small and consisted mainly of a few monthly lotteries and the weekly sport pool. However, during the last 20 years a number of different forms of gambling have been permitted by legislation and today the gambling market in Iceland consists mainly of electronic gaming machines (slot machines), scratch cards, monthly lotteries, Lotto, sport pools and bingo. Additionally, some local equitation clubs are allowed to run betting on horse races for their members, although these events hardly ever take place. However, casinos (e.g., blackjack, roulette) are not permitted in Iceland and any forms of betting on card games (poker, bridge) are illegal. There is no legal age restriction on participation in most gambling activities in Iceland except slot machines, which are illegal for anyone under the age of 16, and betting on horse races, which is illegal for anyone under the age of 18. The operation of gambling activities in Iceland is restricted to non-governmental institutions or charities and the gambling revenues constitute a substantial part of their financial support.

The recent change in the gambling market in Iceland certainly creates more opportunities for adolescents to gamble. However, no systematic studies have been conducted on the extent of gambling participation and the rate of problem gambling among Icelandic youth. The main aim of this study was therefore to investigate the extent to which students in upper secondary and comprehensive schools in Iceland participate in various gambling activities and to provide the first estimates of problem gambling prevalence among youth in Iceland.

The SOGS-RA (Winters, Stinchfield, & Fulkerson, 1993) and the DSM-IV-J/DSM-IV-MR-J (Fisher, 1992, 1993, 2000) are today the main instruments used for studying the prevalence of problem gambling among adolescents. When screening instruments are translated it is important to evaluate the extent to which the psychometric properties of these instruments concur with the original findings. The second aim of this study was therefore to examine the psychometric properties of the Icelandic versions of both SOGS-RA and DSM-IV-MR-J and how much these two instruments overlap in the classification of problem gambling.

METHOD

Participants

The educational system in Iceland includes 4-year upper secondary schools and comprehensive schools that provide instruction in both academic and vocational subjects. Completion of these is required for entering the university system. From a total of 18 upper secondary and comprehensive schools in the greater Reykjavik (the capital) region and in Akureyri (the main town on the north coast of Iceland) 12 schools agreed to participate in the study. Only students in their first 2 years of study (16–18-years-old) were invited to participate and, to minimize bias, students in both academic and vocational schools were included. The total sample was 750 students, average age 17.03 years (s.d. = .73), with 379 males (mean age = 17.0, s.d. = .71) and 371 females (mean age = 17.1, s.d. = .75). Only students who attended classes on the day of collecting data participated in the study and they did so on a voluntary basis.

Instruments

South Oaks Gambling Screen-Revised Adolescents (SOGS-RA; Winters et al., 1993). The SOGS-RA is a modified version of the South Oaks Gambling Screen (SOGS—Lesieur & Blume, 1987). The construction of the SOGS-RA included rewording of several individual items from the SOGS to accommodate adolescent experience and reading levels,

and the number of scoring items was reduced from 20 to 12. The SOGS-RA also includes four questions on gambling participation, gambling expenditure and parental gambling. A preliminary psychometric evaluation on a sub-sample of males showed that the scale has adequate internal consistency (alpha = .80) and the results from a principal components analysis suggested one common factor (Winters et al., 1993). Although there has been some variation between studies in the interpretation of scores from the SOGS-RA (see for example, Poulin, 2000; Winters et al., 1993; Winters, Stinchfield, & Kim, 1995), generally a score of 4 or more is labeled ''problem'' gambling, a score between 2–3 as ''at risk'' gambling, and a score of 0–1 as ''no problem'' gambling (Wiebe et al., 2000). This method was also adopted in the present study.

DSM-IV-MR-J (Fisher, 2000). This is a revised version of the earlier DSM-IV-J gambling screen for adolescents (Fisher, 1992, 1993). The DSM-IV-MR-J includes 12 items that measure 9 out of 10 criteria for DSM-IV diagnosis of adult pathological gambling; (1) preoccupation with gambling, (2) tolerance, (3) loss of control, (4) withdrawal, (5) escape, (6) chasing, (7) lies, (8) illegal and unsocial acts, and (9) risked job, education or relationship. The items have been tested for readability for adolescents and to compensate for the lack of opportunity for probing in surveys, most items are given four response options: ''Never,'' ''once or twice,'' ''sometimes'' or ''often''. The scale has adequate internal consistency (alpha = .75) and a principal components analysis suggested that one component was sufficient to describe the scale, although a two-component solution was possible as well (Fisher, 2000). A score of four or more from the nine DSM criteria items suggests problem gambling.

Procedure

Translation of Instruments. Two independent Icelandic translations of both SOGS-RA and DSM-IV-MR-J were initially made. The two independent translations were examined and one final version was constructed. Subsequently, a professional translator back-translated the final Icelandic version of both scales and the back-translations were compared to the original English versions to ensure accuracy. The scales were then pretested on 23 students not included in the final

sample to explore whether the target population was likely to misunderstand any items. During the pretest, the students received a definition of gambling and were asked to write down the meaning of each item on both SOGS-RA and DSM-IV-MR-J. The responses were examined and led to minor adjustments in wording of three items from the DSM-IV-MR-J scale.

Data collection. After having obtained consent from the Icelandic Data Protection Authority and from the relevant school authorities the questionnaire was administered to students during class. All students attending class on the day of data collection received the same general information before they answered the questionnaire and were instructed to answer the questionnaire individually. Student participation was voluntary and they were ensured confidentiality and were specifically asked not to provide their names or other personal identifiable information. They were also informed that they could terminate their participation at any time without any consequences, adverse or otherwise. None of the students refused participation. A trained researcher was present at all times to answer questions and provide clarification if necessary.

RESULTS

Gambling Participation

From the total adolescent sample, 96.5% reported having gambled at least once in their lifetime, 79.1% had gambled during the previous 12 months, and 10.4% had gambled at least once a week for the preceding 12 months. Females were just as likely as males to have gambled at least once in their lifetime (χ^2 (1, $N = 750$) = 2.73, $p > .098$), but males (86.8%) were more likely than females (71.2%) to have gambled during the previous year (χ^2 (1, $N = 750$) = 27.74, $p \leq .001$). Finally, males (17.4%) were also more likely to have gambled on a regular basis (at least once a week) than females (3.2%) (χ^2 (1, $N = 750$)=40.45, $p \leq .001$).

The most popular gambling activities among the entire adolescent sample in the 12 months prior to the study were scratch tickets (53.7%), followed by gambling machines (46.7%) and the Lotto

(30.4%). Regular gambling in individual games was infrequent and predominantly found among those who play gambling machines (5.7%), sport pools (4.5%) and games of skill (2.2%). Table 1 presents the frequency of play for different types of gambling.

Exploring gender differences for the frequency of play in individual games revealed that males were more likely than females to play the sport pools (χ^2 (2, N = 735) = 119.56, $p \leq .001$), wager on games of skill (χ^2 (2, N = 731) = 42.60, $p \leq .001$), and play the gambling machines (χ^2 (2, N = 722) = 62.57, $p \leq .001$). No significant differences between genders were found for other types of gambling activity.

Factor and Item Analysis for SOGS-RA and DSM-IV-MR-J

SOGS-RA. The 12 items from the SOGS-RA were entered into a principal components analysis and visual inspection of the scree-test suggested one general component (eigenvalue = 4.34) with two possible additional smaller components (eigenvalues 1.36 and 1.18). To explore the possible two- and three-factor solutions the data were reanalyzed and, assuming correlated factors, rotated with the oblique (oblimin) method. The two-factor solution loaded seven items on the

Table 1
Frequency of Gambling Involvement during the Previous 12 months by type of Gambling Activity

Gambling activity	*Never*	*Occasionally*[a]	*Regularly*[b]	*Total (12 months)*
Scratch-tickets	46.3%	52.9%	0.8%	53.7%
Gambling machines	53.3%	41.0%	5.7%	46.7%
Lotto	69.6%	29.7%	0.7%	30.4%
Games of skill	75.5%	22.3%	2.2%	24.5%
Sport pools	76.5%	19.0%	4.5%	23.5%
Card games	79.7%	19.3%	1.0%	20.3%
Bingo	85.8%	13.9%	0.3%	14.2%
Internet gambling	97.6%	2.0%	0.4%	2.4%

[a]Gambling less than once a week.
[b]Gambling weekly or more often.

first factor, three items on the second and two items double-loaded on both factors (see factor loadings in Table 2). The first factor seems to include items about losing control over gambling (items 11 and 8), gambling consequences related to money (items 16, 14, 13) and social difficulties (items 9 and 15). The second factor incorporates an item about gambling related consequences (item 7) and items related to lying and chasing losses (items 5 and 6). An inspection of the factor correlation matrix revealed a moderately high correlation between the factors (.40). A three-factor solution did not offer a clearer picture: Factor 1 from the two-factor solution simply split into two factors with six items double loading.

The two- and three-factor solutions do not offer clear and easily interpretable factors for the Icelandic version of the SOGS-RA. The number of double loadings was unacceptable in the three-factor solution and, although only two items double loaded in the two-factor solution, the meaning of the two factors is rather uncertain as items referring to gambling related consequences load on both factors. The one-factor solution was, however, acceptable, explaining 37% of the item variance with all 12 items loading above .50 on the factor. A subsequent item analysis revealed that the item–total correlations for the 12 items from SOGS-RA were all positive and ranged from .41 to .59. The coefficient alpha for the total scale was also acceptable (alpha = .81). Table 2 presents the factor loadings for one and two factor solutions for SOGS-RA along with the item–total correlations.

DSM-IV-MR-J. A similar analysis was conducted for the DSM-IV-MR-J. Repeating the analysis from Fisher (2000) the nine DSM-IV-MR-J criteria items were entered into a principal components analysis and a visual inspection of the scree-test suggested one general component (eigenvalue = 3.67), with one possible smaller additional component (eigenvalue = 1.05). To explore the possible two-factor solution the data were reanalyzed and, assuming correlated factors, rotated with the oblique (oblimin) method. Five criteria items loaded on factor 1 (6. chasing losses, 2. tolerance, 4. withdrawal, 8. unsocial/illegal acts and 9. risked job/social relationship) and four on the second factor (1. preoccupation, 5. escape, 3. loss of control and 7. lies). One item (7. lies) double loaded on factor 1 (see Table 3 for factor loadings). The first-factor seems to be about gambling addiction (chasing losses, tolerance and withdrawal) and the antisocial or illegal gambling

Table 2
Factor Analysis and Item–Total Correlations for SOGS-RA

	Two-factor solution		*One-factor solution*	
Item number[a]	*Factor 1*	*Factor 2*	*Factor loadings*	*Item–total correlations*
5 (Gone back another day to try to win back money lost)	<.10	**.62**	**.60**	.45
6 (Ever told others you were winning money when you were not)	<.10	**.70**	**.51**	.40
7 (Betting money ever caused problems for you with family/friends or school/work)	−.13	**.89**	**.53**	.43
8 (Gambled more than you had planned to)	**.37**	.26	**.55**	.46
9 (Criticized your betting or told you had gambling problems)	**.67**	<.10	**.68**	.56
10 (Felt bad about the amount you bet or about what happens when you bet money	**.39**	**.31**	**.59**	.51
11 (Would like to stop betting money but don't think you could)	**.87**	−.23	**.63**	.52
12 (Hide betting slips from family/friends)	**.42**	**.49**	**.73**	.59
13 (Money arguments with family/friends)	**.57**	.28	**.72**	.57
14 (Borrowed money to bet and not paid it back)	**.67**	<.10	**.55**	.42
15 (Ever skipped or been absent from school or work due to betting)	**.55**	<.10	**.52**	.42
16 (Borrowed money or stolen something to cover gambling debts)	**.68**	<.10	**.62**	.49

[a]Item numbers correspond to Winters et al. (1993).
Factor loadings >.30 are in bold-type font.

Table 3
Factor Analysis and Item–Total Correlations for DSM-IV-MR-J

	Two factor solution		*One factor solution*	
Item number[a]	*Factor 1*	*Factor 2*	*Factor loadings*	*Item–total correlations*
1. Preoccupation	−.14	**.82**	**.52**	.38
2. Tolerance	**.70**	<.10	**.56**	.43
3. Loss of control	.14	**.62**	**.62**	.49
4. Withdrawal	**.68**	.18	**.77**	.62
5. Escape	<.10	**.72**	**.59**	.46
6. Chasing	**.79**	<.10	**.79**	.68
7. Lies	**.32**	**.53**	**.71**	.57
8. Unsocial/illegal acts	**.65**	<.10	**.64**	.51
9. Risked education /Family relationship	**.58**	<.10	**.48**	.37

[a]Criteria item numbers correspond to Fisher (2000).
Factor loadings >.30 are in bold type font.

consequences (e.g., stealing, family problems, truancy) that can accompany gambling addiction. The second-factor seems to be about the possible psychological states that are associated with problem gambling, such as being preoccupied with thoughts about gambling, gambling to escape from daily problems or depressed mood, and losing control. This certainly suggests the possibility for a two-factor solution for the Icelandic version of the DSM-IV-MR-J although it must be noted that the pattern of item loadings does not replicate the original two-factor solution reported by Fisher (2000, Table 6, p. 269).

However, the one-factor solution was found to be satisfactory for the present sample, replicating the one-factor solution preferred by Fisher (2000). The first component explains 41% of the item variance with all criteria items loading above .45 on the component. A subsequent item analysis revealed that the item–total correlations for the 9 criteria items from DSM-IV-MR-J were all positive and ranged from .37 to .68. The coefficient alpha for the total scale (alpha = .78) was also acceptable. Table 3 presents the factor loadings for two and

one factor solutions for DSM-IV-MR-J along with the item–total correlations.

Problem gambling

After having established that a one-factor solution was acceptable for both instruments, the scores were used to classify participants into problem gambling groups (see Table 4). There were some differences in problem gambling rates between the two instruments. The DSM-IV-MR-J identified 2.0% of the sample as problem gamblers with a further 3.2% at risk for gambling problems. These figures were slightly higher for SOGS-RA as 2.7% were identified as problem gamblers with a further 4.4% at risk for gambling problems (see Table 4).

There were clear gender differences observed for both instruments, SOGS-RA (χ^2 (3, N = 750) = 53.91, $p \leq .001$) and DSM-IV-MR-J (χ^2 (3, N = 750) = 47.47, $p \leq .001$). Both instruments identified only one and the same female as a problem gambler and females were also less likely to be classified ''at risk'' than males (see Table 4).

Overall, these results indicate that DSM-IV-MR-J is a slightly more conservative measure of problem gambling than SOGS-RA, although the difference is rather subtle (0.7%). This difference is also smaller

Table 4
Problem Gambling Groups According to SOGS-RA and DSM-IV-MR-J

Instrument	*Non-Gambler (n)*	*No problems (n) (score 0–1)*	*At risk (n) (score 2–3)*	*Problem (n) (score ≥ 4)*
SOGS-RA				
Male	13.2% (50)	74.4% (282)	7.4% (28)	5.0% (19)
Female	28.8% (107)	69.5% (258)	1.3% (5)	0.3% (1)
Total	20.9% (157)	72.0% (540)	4.4% (33)	2.7% (20)
DSM-IV-MR-J				
Male	13.2% (50)	77.6% (294)	5.5% (21)	3.7% (14)
Female	28.8% (107)	70.1% (260)	0.8% (3)	0.3% (1)
Total	20.9% (157)	73.9% (554)	3.2% (24)	2.0% (15)

Total N = 750.

than has been reported between DSM-IV-J based measures and SOGS-RA in earlier studies (Derevensky & Gupta, 2000; Volberg, 2002). The correlation coefficient between the two scales was .79 ($p \leq .001$) for the total sample, with the correlations being higher among males (.80) than females (.68).

Finally, to examine the degree of overlap between the two scales the concordance between them was cross-tabulated. However, as neither scale can be regarded as the ''gold standard'' for the measurement of adolescent problem gambling (see Derevensky & Gupta, 2000; Derevensky, Gupta, & Winters, 2003; Poulin, 2002) neither scale was defined as the criterion. Instead the degree of overlap between the scales was estimated with simple frequency counts and a weighted kappa statistic (see Orford et al., 2003 for a similar analysis). The results of the concordance estimates are presented in Table 5.

Not surprisingly, about 45% (9/20) of those who were classified as problem gamblers by the SOGS-RA were not identified as problem gamblers by the DSM-IV-MR-J. On the other hand, about 27% (4/15) of those who were identified as problem gamblers by the DSM-IV-MR-J were not classified as such by the SOGS-RA. Further examination of those four classified as problem gamblers by the DSM-IV-MR-J but not by the SOGS-RA revealed that all four were classified in the ''at risk'' group by the SOGS-RA. On the other hand six of the nine students who were classified as problem gamblers by the SOGS-RA but not the DSM-IV-MR-J were classified as ''at risk'' gamblers by the DSM-IV-MR-J. Only three students who scored within the problem gambling range on the SOGS-RA were classified as ''non problem'' gamblers by the DSM-

Table 5
Concordance Between SOGS-RA and DSM-IV-MR-J Problem Gambler Classifications

		DSM-IV-MR-J problem gambler		
		NO	*YES*	*TOTAL*
SOGS-RA problem gambler	NO	726	4	730
	YES	9	11	20
	TOTAL	735	15	750

IV-MR-J. A further inspection of these three students revealed that they had gambled in fewer games during the preceding 12 months (mean = 2.66) than other problem gamblers (mean = 4.76) and had also started substantially later to gamble (mean age = 13) than other problem gamblers (mean age = 10.88). No other differences were observed. The fact that these three students gamble less than other problem gamblers might indicate that their problem gambling is less advanced than for other problem gamblers. This might also explain why they did not score within the problem gambling range on the DSM-IV-MR-J, which is a more conservative measure of problem gambling than the SOGS-RA (see Derevensky and Gupta, 2000). However, overall these results suggest that the concordance between both scales is acceptable and the weighted kappa statistics (Kappa =.62) supports this conclusion.

DISCUSSION

The main aim of this study was to provide the first estimates of gambling and problem gambling among Icelandic adolescents and to evaluate the psychometric properties of the Icelandic versions of two gambling screens for adolescents.

Gambling was widespread among the adolescents participating in this study. Almost everyone had gambled at least once in his or her lifetime and only slightly fewer than 80% had done so during the preceding 12 months. Males were more likely to have gambled during the preceding year than females and the number of regular (once a week or more) gamblers was much higher among males than females. These findings are similar to results from a recent study on 1266 university students in Iceland where about 75% of the students had gambled during the preceding 12 months and gambling was more frequent among males (82%) than females (71%) (Olason, Finnbogadottir, Hauksdottir, & Barudottir, 2003). Together, these findings indicate that gambling is an accepted and relatively common pastime behavior among adolescents and university students in Iceland and concur with research findings from other European countries and North America (e.g., Fisher, 1993, 1999; Gupta & Derevensky, 1998; Jacobs, 2000; Johanson & Götestam, 2003).

Items for both the SOGS-RA and DSM-IV-MR-J were entered into two separate factor analyses. The results suggested a possible one- or two-factor solution for both scales. The one-factor solution was preferred for the SOGS-RA as the two-factor solution did not offer clear and interpretable factors and was also different from the two factor solutions reported in other studies (see Wiebe et al., 2000; Winters et al., 1993). However, the two-factor solution for DSM-IV-MR-J suggested two rather clear and interpretable factors, where factor 1 seemed to be about gambling addiction and the second factor about the possible psychological states that are associated with problem gambling. However, it is important to note that the two-factor solution found for the Icelandic sample was to some extent different from the two-factor solution reported by Fisher (2000, Table 6, p. 269). The different findings might result from sample variation as the present findings are based on a smaller sample with slightly older participants. The one factor solution for the DSM-IV-MR-J, however, was robust for the Icelandic sample with all items loading high on the factor.

In general the psychometric properties of the Icelandic versions of both the SOGS-RA and DSM-IV-MR-J are judged to be acceptable and concur with the original findings (Fisher, 2000; Winters et al., 1993). The reliabilities for both scales were satisfactory and the factor and item analysis supports the conclusion that both scales can be regarded as relatively homogenous measures of problem gambling, with all items on both scales loading on one factor.

The estimates of problem gambling (2–2.7%) obtained in this study were considerably lower than is typically reported in studies from North America and Britain (e.g., Fisher, 1992, 1993; Derevensky & Gupta, 2000; Gupta & Derevensky, 1998; NRC, 1999; Shaffer & Hall, 1996), although similar figures have on some occasions been reported in other studies from North America and particularly in Europe (e.g., Becoña, 1997; Johansson & Götestam, 2003; Ladouceur et al., 1999; Poulin, 2000; Volberg, 2002). Problem gambling was almost exclusively found among boys in this study, with between 3.7% (DSM-IV-MR-J) and 5.0% (SOGS-RA) classified as problem gamblers in contrast to only 0.3% of the girls. Gender differences of this sort are commonly reported in the literature (e.g., Johanson & Götestam, 2003; Raylu & Oei, 2002) and suggest the need for the development of preventive and therapeutic programs aimed specifically at adolescent boys.

The prevalence estimates on problem gambling in this study are also very similar to the prevalence figures reported from Norway and Sweden (Abbott, Volberg, & Rönnberg, 2004; Johansson & Götestam, 2003). For example, Johansson and Götestam (2003) examined problem gambling prevalence among 3237 12–18-year-old Norwegian adolescents using a DSM-IV-based measure. The prevalence of pathological gambling was 1.76%, which is similar to the 2.0% figure that was obtained for the DSM-IV-MR-J instrument in this study. Combined, these results indicate that the prevalence of problem gambling in the Scandinavian countries might be somewhat lower than obtained elsewhere. However, further research must be conducted within the Nordic countries to confirm the present results, particularly in Denmark and Finland where, to our knowledge, no published studies on adolescent problem gambling exist.

Finally, in a recent review on youth gambling in North America it was noted that gambling participation amongst 12–17-years-old had increased considerably for the past 20 years. Parallel to an increase in gambling participation the prevalence of youth problematic gambling had also increased during the same period (Jacobs, 2004). Interestingly, these studies also reveal that the age of onset for the first gambling experience is much lower among juveniles (11–13 years) than among older adults (i.e., 14–18 years), and it seems that the age of onset, which predicts later problem gambling, is decreasing steadily among North American juveniles (see Jacobs, 2004 for further discussion). The relatively low rates of problem gambling among 16–18-years-old adolescents in this study might reflect the fact that some forms of gambling (e.g., gambling machines, scratch cards) are relatively new in Iceland. Considering, that there is a delay between onset of gambling and problem gambling, prevalence figures among Icelandic youth might rise in the future, especially if the age of onset of gambling among Icelandic youth follows the same trends as observed in North America.

In conclusion, the present study shows that most of the participating adolescents gamble to some degree and an estimated 2–2.7% are classified as problem gamblers. The Icelandic versions of both the SOGS-RA and the DSM-IV-MR-J have acceptable psychometric properties and the DSM-IV-MR-J proved to be a slightly more conservative measure of problem gambling than the SOGS-RA. The preliminary evidence that this study offers suggests that gambling problems among

adolescents is an area of concern for the Icelandic community that needs to be addressed with further studies to clarify the extent and seriousness of youth problem gambling in Iceland.

However, a note of caution has to be added to the present findings; the sample was a convenience sample drawn from a limited number of upper secondary and comprehensive schools from two areas in Iceland. It cannot be excluded that a proportionately higher number of adolescents with gambling problems either did not attend class on the day the data were collected or had earlier dropped out of school. It is therefore important to replicate this study and examine the association between problem gambling with other known risk factors for problem gambling in a larger and more representative sample of Icelandic youth.

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