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An Assessment of the Psychometric Properties of Lithuanian Versions of DSM-IV-MR-J and SOGS-RA

N. Skokauskas · B. Burba · D. Freedman

Abstract *Objective*: Since no Lithuanian instrument focuses specifically on the measurement of pathological gambling in adolescence, we aimed to adapt commonly used international instruments (SOGS-RA, DSM-IV-MR-J) and assess their psychometric properties. *Methods*: Cross-cultural adaptation of DSM-IV-MR-J and SOGS-RA was performed in several steps including translations, synthesis of translations, back-translations, expert committee review, and pre-testing. Adapted instruments were administered to randomly selected adolescents in grades V through XII from all schools in the second largest Lithuanian city (Kaunas). *Results*: The DSM-IV-MR-J identified 4.2% of the representative sample as pathological gamblers, whereas the SOGS-RA generated prevalence of 5.2%. Cronbach's alpha for DSM-IV-MR-J in this sample was 0.80 and 0.75 for the SOGS-RA. The correlation coefficient between the SOGS-RA and the DSM-IV-MR-J was statistically significant (Pearson correlation $= 0.892$, $P < 0.001$). Using the DSM-IV-MR-J as the baseline for pathological gambling in adolescence, the overall classification accuracy of the SOGS-RA was judged to be adequate, correctly identifying 34 out of 35 pathological gamblers (Kappa $= 0.833$, $P < 0.001$). *Conclusions*: The Lithuanian versions of DSM-IV-MR-J and SOGS-RA exhibited acceptable validity and reliability. The DSM-IV-MR-J was found to be a more conservative measure of pathological gambling.

Keywords Pathological gambling · Adolescence · Psychometric properties · DSM-IV-MR-J · SOGS-RA

Introduction

Lithuania is a small country situated on the Baltic Sea coast. It was an independent Grand Duchy in the Middle Ages. Official documents from those times state that

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gambling was common in the Grand Duchy of Lithuania, and that there were problems because of such gambling behaviour. Official documents show that a few people were imprisoned because of gambling-related problems. Gambling was then considered a 'very dangerous and harmful behaviour' (Baliulis and Meilus 2001). Later Lithuania formed a union with Poland, and in the late eighteenth century became part of the Russian Empire. Following the end of the First World War, Lithuania was an independent state until it was absorbed into the USSR after World War II. The ruling Communist party strictly controlled the economy, and gambling was prohibited. A few state lotteries continued to exist to support the Red Army. Casino and gambling were synonymous with 'rotten capitalism'. People continued to play card and dice games, mainly at home and just for recreation. On the 11th of March 1990 Lithuania re-established its independence. Dramatic changes took place in all areas of life. A free-market economy was re-introduced and private initiative was encouraged once again. Despite major changes gambling wasn't legalised initially. Interestingly, neither it was prohibited. Simply there was no gambling law.

Gambling remained officially illegal, but during the initial years of Lithuanian capitalism in the early 1990s, certain common forms of gambling became widespread. Finally, in 2001, gambling was legalised in Lithuania. Gambling-related problems (and their prevention) were not considered in Lithuanian gambling law, and officials claimed that pathological gambling was a disorder created by "sensation-seeking journalists".

Since 2001, Lithuanian gambling business has been developing very rapidly, with an annual growth of 50% and more (Lithuanian State Gambling Control Commission 2006). Not surprisingly, gambling-related problems became more and more evident; pathological gamblers (or their families) attacked the Gambling Control Commission with requests that something be done about this emerging problem, or at least that a self-exclusion programme be introduced. Although there is currently an official self-exclusion programme, it is not considered in the Lithuanian Gaming Law, and it's status is somehow complicated from a legal perspective.

Clinicians, in the meantime, saw an unprecedented increase in referrals of adolescents with gambling-related problems. Lithuanian Gaming Law in some contexts has few age-related constraints compared to similar legal acts in other developed countries. For example, there is no age limit for lotteries in Lithuania.

Since no Lithuanian instrument focuses specifically on the measurement of pathological gambling in adolescence, we aimed to adapt the commonly used international instruments: the South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA) and the Diagnostic Statistical Manual-IV-Adapted for Juveniles; (DSM-IV-MR-J), and assess their psychometric properties.

Methods and Materials

Data Collection and Participants

Research took place in Kaunas, the second biggest city in Lithuania. Formal applications to conduct research were made to schools by the Kaunas University of Medicine, Department of Psychiatry, Kaunas Drug Abuse Help Centre for Youth, and the Department of Education. The Regional Committee of the Lithuanian Bioethics Committee approved the project (registration no. BE 2-2).

Subjects were randomly selected students in grades V through XII (four classes from each grade) from all Kaunas secondary schools. The sample size for the survey was determined using the formula:

$$n = \frac{1}{\Delta^2 + \frac{1}{N}}$$

In this formula 'Δ' is the critical value for a 95% confidence interval, 'N' the general set, and 'n' the sample size. At the time of the survey there were 38,103 adolescents (from grades V–XII) in Kaunas. The primary sampling unit was the class.

Students from 32 classes from 24 schools took part in the present study. There were 869 schoolchildren in the selected classes. In classes where one or more pupils were absent on the day of the survey, up to three follow-up visits were arranged to complete the data set.

Procedure

Respondents were given a questionnaire to fill in during regular class time. Students completed the questionnaire individually, and were instructed that gambling is defined as an activity that involves an element of risk where money is wagered and could be won or lost. Participants were informed that their participation was voluntary. At least two trained research assistants were present at all times to answer questions, and teachers were asked to leave the classroom. Respondents were requested not to write their names or surnames in order to maintain anonymity. Each student was assigned a unique identification code, which was noted on all documents.

Statistical Analysis

Data were analysed using SPSS 12 for Windows. The Kolmogorov–Smirnov test was used to confirm the normal distribution of continuous variables. Groups were compared regarding a number of characteristics using Student's *t*, Kruskal–Wallis, Chi-square, and Fisher's exact tests as appropriate. Analysis of variance (ANOVA) was additionally used to determine significant differences. Significance levels of 0.05 were adopted. Correlation between quantitative, normally distributed variables, were analysed through Pearson's correlation coefficient. Cronbach's alpha was calculated as a test of internal reliability. The kappa statistic was used to measure of agreement between SOGS-RA and DSM-IV-MR-J results. A discriminant function analysis was carried out in order to determine which of the items on the DSM-IV-MR-J scale most contributed to the difference between non-gamblers and pathological gamblers.

Screening Instruments

The South Oaks Gambling Screen (Lesieur and Blume 1987) is the most widely used and quoted tests for pathological gambling, and it emphasises the financial risks of excessive gambling. Winters et al. (1993) created the South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA) from the SOGS in an attempt to provide an accurate measure for adolescent gambling behaviour and pathological gambling.

The South Oaks Gambling Screen-Revised for Adolescents comprises a 16-item scale (with four items being omitted for scoring). It assesses gambling behaviour and gambling-related problems during the past 12 months along a single dimension. Items from the

original South Oaks Gambling Screen were re-phrased to make them more age-appropriate, and the scoring scheme was adjusted. In particular, the revised instrument emphasized the frequency of gambling behaviour and the behaviour accompanying pathological gambling, as opposed to the heavy emphasis on money in the adult version. Winters et al. (1993) reported satisfactory reliability (0.80) and validity measures.

There has been some variation between studies in the interpretation of scores from the SOGS-RA (Winters et al. 1993, 1995), however generally a score of 4 or more is labelled 'problem' gambling, a score of 2 or 3 as 'at-risk' gambling, and a score of 0 or 1 as 'no problem' gambling (Wiebe and Mehmel 2000). This approach was employed in the present study.

A few researchers have argued that the South Oaks Gambling Screen-Revised for Adolescents overestimates pathological gambling in the general population (Abbott and Volberg 1996; Ladouceur et al. 2000). Also, given the low rate of female pathological gamblers in the original sample (a difficulty common to many adolescent instruments), Ferris et al. noted that the instrument has not been adequately tested with adolescent females (Ferris 1999). Poulin argued that the existing threshold of the SOGS-RA score for problem gambling identifies as problem gamblers, markedly different proportions of male than female daily gamblers (Poulin 2002). Notwithstanding these reservations, the South Oaks Gambling Screen-Revised for Adolescents remains the most widely used screening instrument for adolescent gambling.

The Diagnostic Statistical Manual-IV-Multiple Response-Adapted for Juveniles is a measure of pathological gambling in the general adolescent population. DSM-IV-MR-J (Fisher 2000) is a revised version of the DSM-IV-J, and includes 12-items (9-categories). The DSM-IV-MR-J was developed for use with adolescents who have gambled during the past year. The DSM-IV-MR-J assesses a number of important variables related to pathological gambling: progression and preoccupation, tolerance, withdrawal and loss of control, escape, chasing, lies and deception, illegal activities, and family and school disruption. Each item endorsed is given a score of 1. The score obtained is calculated with a total of nine points, related to each of the nine items. Participants who obtain a score of 0 or 1 are classified as social gamblers. A score of 2 or 3 indicates a 'risk of gambling behaviour' (Fisher 2000).

Derevensky and Gupta (2000) conducted an empirical comparison of the SOGS-RA, DSM-IV-J and the Gamblers Anonymous 20 Questions. Nine hundred and eighty adolescents were administered all three screens. The most conservative measure of pathological gambling was given by the DSM-IV-MR-J test (3.4%), followed by the SOGS-RA (5.3%), and the Gamblers Anonymous 20 Questions (6.0%). Prevalence rates are, therefore, partially determined by the screening tool employed, and must be viewed accordingly (Derevensky and Gupta 2000).

The SOGS-RA and the DSM-IV-J were translated into Lithuanian and back translated into English. International experts compared the back translation to the original version for accuracy, and this showed that the translated items closely resembled the meaning of the English items. A pilot study was conducted to test the working effectiveness of the questionnaire. This was administered to a sample of 35 participants.

Results

In total, 835 adolescents, representing students from grades V to grades XII, consistently answered questions and were included in the present analysis. The response rate was 96%. The sample was 52.7% female. The mean age was 14.5 ± 2.2 years (range 10–18).

The results indicated that a large majority of adolescents had engaged in a variety of gambling activities. Most respondents (82.7%, 690) reported ever having engaged in at least one gambling activity. It is important to note that while 17.3% of adolescents reported never having gambled, females accounted for a significant proportion of this group (66.2%).

Based on the DSM-IV-MR-J, 4.2% (N = 35) of participants were categorized as pathological gamblers, with a further 9.1% (N = 76) classified as at-risk gamblers, 69.4% (N = 579) as social gamblers, and 17.3% (N = 145) as non-gamblers. Based on the SOGS-RA, 5.2% (N = 43) of participants were categorized as pathological gamblers, with a further 10.5% (N = 88) classified as at-risk gamblers, 67% (N = 559) as social gamblers, and 17.3% (N = 145) as non-gamblers.

SOGS-RA identified a larger number of males (8.4%) as pathological gamblers than did DSM-IV-MR-J (6.3%). Both instruments identified equal numbers of females (2.3%) as pathological gamblers. DSM-IV-MR-J scores ranged from 0 to 7, with a mean of 0.53 ± 1.18. Of all gamblers 537 had no DSM-IV-MR-J symptoms, 103 had one or two DSM-IV-MR-J symptoms, 39 had three to four DSM-IV-MR-J symptoms and 11 had five or more DSM-IV-MR-J symptoms. Among pathological gamblers, DSM-IV-MR-J scores ranged from four to seven points, the mean being 4.51 ± 0.88 and the median 4. Among at-risk gamblers, DSM-IV-MR-J scores ranged from two to three points, with a mean of 2.2 ± 0.4 and median of 2. Among social gamblers, DSM-IV-MR-J scores ranged from zero to one points, the mean being 0.07 ± 0.026, and median 0. The differences between the means in the three sub-samples were statistically significant (Kruskal–Wallis: $\chi^2 = 532.3$, df = 2, $P < 0.001$). Pathological gamblers endorsed all items more frequently than did social and at-risk gamblers, with using gambling as a way of escape or relieving dysphoric mood receiving the highest endorsement (65.7%).

Psychometric Properties of Lithuanian SOGS-RA and DSM-IV MR-J

The term 'psychometric', which originally meant, 'mind measuring' is now used more generally to describe the performance characteristics of many types of measures. The two principal properties of psychometric measures are reliability and validity (Blacker and Endicott 2002).

Internal Consistency

Internal consistency is a measure of agreement among the individual components of a measure. Cronbach's alpha is an index of reliability associated with the variation accounted for by the true score of the "underlying construct." The higher the score, the more reliable the generated scale is. A score of .70 or greater is generally considered to be acceptable (Blacker and Endicott 2002). Cronbach's alpha for the 12-item DSM-IV-MR-J in this sample was 0.80 and 0.75 for Lithuanian SOGS-RA.

Item Analysis

For this analysis, SOGS-RA classification of social, at-risk, and pathological gamblers was used. Table 1 shows that all Lithuanian DSM-IV-MR-J screen items discriminate effectively between SOGS-RA defined social, at-risk, and pathological gambling among adolescents.

Table 1 Comparing SOGS-RA groups on DSM-IV-MR-J items

DSM-IV-MR-J items	Social gamblers (N = 559) (according to SOGS-RA)		At-risk gamblers (N = 88) (according to SOGS-RA)		Pathological gamblers (N = 43) (according to SOGS-RA)		Chi-square test of significance P
	N	%	N	%	N	%	
Chasing	13	2.3	9	10.2	12	27.9	<0.001
Preoccupation	3	0.5	28	31.8	22	51.2	<0.001
Tolerance	8	1.4	13	14.8	11	25.6	<0.001
Loss of control	10	1.8	26	29.5	16	37.2	<0.001
Withdrawal	4	0.7	6	6.8	6	14	<0.001
Escape	2	0.4	39	44.3	24	55.8	<0.001
Deception	3	0.5	13	14.8	20	46.5	<0.001
Used lunch money or fare money for gambling	2	0.4	10	11.4	15	34.9	<0.001
Took money from family to gamble without telling them	1	0.2	13	14.8	14	32.6	<0.001
Took money from outside family to gamble without telling them	5	0.9	21	23.9	18	41.9	<0.001
Risked significant relationship	4	0.7	11	12.5	15	34.9	<0.001
Academic disruption	3	0.5	19	21.6	10	23.3	<0.001

The differences between means of DSM-IV-MR-J scores in the SOGS-RA three subsamples (social gamblers, at-risk gamblers, and pathological gamblers) were statistically significant (Kruskal–Wallis: $\chi^2 = 487.5$, df = 2, $P < 0.001$). Discriminant function analysis identified 'Escape' (DSM-IV-MR-J item) as the best discriminator (Standardized Canonical Discriminant Function Coefficient = 1.4).

Validity

The validity of a measure is the degree to which the diagnosis, category, rating, or score is a reflection of the true state of nature (Blacker and Endicott 2002).

Criterion Validity

Criterion validity is a way of assessing validity by comparing the results with another measure. The correlation coefficient between the SOGS-RA and the DSM-IV-MR-J was statistically significant (Pearson correlation = 0.892, $P < 0.001$).

Using the Diagnostic Statistical Manual-IV-Multiple Response-Adapted for Juveniles as the baseline for pathological gambling in adolescence, the overall classification accuracy of the South Oaks Gambling Screen-Revised for Adolescents was judged to be adequate, correctly identifying 34 out of 35 pathological gamblers (Kappa = 0.833, $P < 0.001$).

SOGS-RA classification accuracy indices: sensitivity: 34/35 = 0.97; specificity: 646/655 = 0.986; false positive rate: 9/43 = 0.20; false negative rate: 1/647 = 0.00015 (Table 2).

Table 2 Classification accuracy of the SOGS-RA

SOGS-RA score	DSM-IV-MR-J diagnosis		Row totals
	No	Yes	
<4	646	1	647
4+	9	34	43
Column totals	655	35	690

SOGS-RA classification accuracy indices: sensitivity: 34/35 = 0.97; specificity: 646/655 = 0.986; false positive rate: 9/43 = 0.20; false negative rate: 1/647 = 0.00015

Construct Validity

Construct validity is a comparison of the measure with external validators. It is helpful to examine differences between pathological, at-risk, and social gamblers with respect to behaviours that are associated with pathological gambling but which are not included in DSM-IV-MR-J. Measures related to gambling difficulties could include the frequency of gambling, the largest amount of money ever gambled in the past 12 months, or gambling using different modalities.

The highly significant differences in the mean scores of regular (those adolescents who reported having gambled at least once per week) and occasional gamblers (those adolescents who reported having gambled less than once per week) on the DSM-IV-MR-J provide some evidence of construct validity for the scale (Kruskal–Wallis: $\chi^2 = 179.5$, df = 1, $P < 0.001$).

Significantly more pathological gamblers (according to DSM-IV-MR-J) (14.3%) than other gamblers (2.1%) have spent a maximum of 100–200 Litas (40–80 US dollars) on gambling in the past 12 months. Pathological gamblers (71.4%) were also significantly more likely than non-pathological gamblers (51.8%) to gamble on more than two activities ($P < 0.05$).

Discussion and Conclusions

Pathological gambling is already a problem for some young people in Lithuania. In future, pathological gambling will, no doubt, receive more attention form researchers, clinicians, schools and hopefully politicians in Lithuania. For future research and clinical work it is crucial to know which screens are validated and reliable. In the present study the Lithuanian versions of DSM-IV-MR-J and SOGS-RA exhibited acceptable validity and reliability.

As with all studies, this study also has some limitations, and certain limitations should be considered in interpreting the findings. First of all, this study used exclusively self-reported data. However, studies based on self-reporting are the norm, in research into adolescent gambling and in general in adolescent addiction. Secondly, data collection took place in schools, and findings represented the population of school-attending adolescents. However according to the Department of Education there were less than 2% of adolescents who didn't attend school in Kaunas at the time research was conducted.

In discussing Lithuanian versions of DSM-IV-MR-J and SOGS-RA, it is important to emphasise that Cronbach's alpha for both instruments was quite high. The item analysis shows that all of the DSM-IV-MR-J items clearly distinguished social, at-risk, and

pathological gamblers. Interestingly discriminant function analysis identified 'Escape' (Diagnostic Statistical Manual-IV-Multiple Response-Adapted for Juveniles) as the best discriminator.

Criterion validity is a way of assessing validity by comparing the results with another measure. Correlation between Lithuanian version of South Oaks Gambling Screen-Revised for Adolescents and the DSM-IV-MR-J was statistically significant.

Using the DSM-IV-MR-J for Juveniles as the baseline for pathological gambling in adolescence, the overall classification accuracy of the South Oaks Gambling Screen-Revised for Adolescents was judged to be adequate, correctly identifying 34 out of 35 pathological gamblers. The false negative rate was low, but the false positive rate was higher (Table 2).

Adolescents classified as pathological gamblers (according to DSM-IV-MR-J) were significantly different from social gamblers and at-risk gamblers in a number of expected ways. They tended to engage in more gambling activities, they gambled more often, and they were significantly more likely than non-pathological gamblers to have lost higher amounts of money over the previous 12 months.

Our study confirmed findings from previous study which employed original versions of SOGS-RA and DSM-IV-MR-J (Derevensky and Gupta 2000). We also found that the Diagnostic Statistical Manual-IV-Multiple Response-Adapted for Juveniles is more conservative measure than the SOGS-RA. It is interesting to note that the SOGS-RA identified more males (8.4%) than Diagnostic Statistical Manual-IV-Multiple Response-Adapted for Juveniles (6.3%) and the same number of females (2.3%) as pathological gamblers. Males appeared to be almost three times more likely to be classified as pathological gamblers (6.3 vs. 2.3%) and almost three times more likely to be classified as at-risk-gamblers than females (14.2 vs. 4.5%) according to DSM-IV-MR-J.

Further research is necessary to determine whether or not the prevalence of pathological gambling will increase among adolescents in Lithuania. This study has provided an important baseline from which future research can compare rates of change in the prevalence of gambling and pathological gambling among adolescents, and longitudinal, perspective research design is the best way to measure changes in gambling behaviour over time. The Lithuanian version of DSM-IV-MR-J and SOGS-RA should be employed as in the current study.

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