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Abstract = 194
Text =
Tables =
References =

**Pathological Gambling Among Louisiana Students:
Grades Six Through Twelve**

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**Pathological Gambling Among Louisiana Students:
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Abstract

Objectives: To determine the prevalence of disordered gambling behavior, the average age of onset of gambling behavior, and the co-occurrence of gambling disorders with frequent substance use, within the Louisiana student population grades 6th-12th. **Methods:** A stratified random survey of 12,066 students (grades 6th-12th) in public and non-public schools (1996-1997 school year). **Results:** Lifetime prevalence of gambling was 86%. Past-year prevalence of Level 2 problem gambling was 10.1% and Level 3 pathological gambling behavior was 5.9%. The average age of onset of gambling behavior was 11.2 years. Frequent alcohol and other illicit drug use occurred in 59% of students with Level 2 and 3 gambling disorders. **Conclusions:** This study identified four significant factors in Louisiana student gambling behavior: (1) gambling behavior is widespread; (2) gambling experimentation behavior usually begins in 5th grade and precedes other experimentation behaviors (smoking tobacco, marijuana, and alcohol use); (3) disordered gambling behavior is consistently prevalent from 6th-12th grades, and; (4) although the majority of students with gambling disorders use alcohol and other illicit drugs regularly, gambling disorders are not limited to those students. Primary prevention of gambling disorders should target 3rd-6th graders, with secondary prevention appropriate for 6th-12th graders.

Introduction:

Louisiana has a rich heritage for gambling activities. Legalized pari-mutuel racing dates back to the 1940's. Charitable gaming was legalized in 1968, riverboat casinos in ____, video poker machines in ____ and the Louisiana Lottery began in _____. *Add a sentence on the Indian casinos and the New Orleans Land Based casino. Add a sentence on the number of licenses per population*¹. To date, research on adolescent participation in gambling activities and related disordered gambling behaviors is limited. Many of the studies which have been conducted on adolescent gambling behavior have utilized the South Oaks Gambling Screen-Revised for Adolescents (SOGS-RA) as a screening instrument². The SOGS-RA is an objective questionnaire with twelve scored items addressing issues surrounding the preoccupation with gambling: interference with school or home environments, returning to gamble to cover previous losses "chasing"; lying to conceal losses and or evidence of betting; escalating amounts of money and time spent gambling; arguments and criticism focusing on gambling activities; borrowing money to bet or cover debts; and the experience of guilt about gambling activities and the inability to cease gambling. SOGS-RA scores of 0-1 (Level 1) indicate no problem with gambling. A score of 2 or 3 (Level 2) indicates problem gambling behaviors and a score of 4 or more

(Level 3) would be classified as pathological gambling behavior.³ *Define problem and pathological gambling from the handout.*

Two recent meta-analytic studies have suggested that adolescents have a higher prevalence of disordered gambling than do adults. A meta-analysis of adolescent gambling prevalence studies⁴ published in 1996 analyzed results of nine independent studies from five regions of the United States and Canada. Data from over 7,700 young people (15-20 years) suggested that between 77.9% and 83% gambled at a non-problem level (Level 1), 9.9% to 14.2% displayed Level 2 (problem) gambling behavior, and 4.4% to 7.4% displayed Level 3 (pathological) gambling behavior.

A more recent meta-analysis of gambling prevalence studies included 14 adolescent studies from four provinces in Canada and eight states in America that had been performed between 1987 and 1997², with approximately 19,000 total subjects.

Table One

North American Gambling Disorders Past-Year Prevalence Rates for Adult and Adolescent General Populations³

Adult General	95% Confidence	Adolescent General	95% Confidence
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Diagnosis	Population	Interval	Population	Interval
Level 2 (problem)	2.8%	2.0–3.7%	14.8%	9.0–20.7%
Level 3 (pathological)	1.1%	.9–1.4%	5.8%	3.2–8.4%

Health care professionals may lack awareness regarding the extent of gambling disorders in adolescents because only 42% of studies from the 1997 meta-analysis have been published in the scientific literature. Illegal adolescent participation in legalized (for adults) gaming activities also remains an unappreciated problem⁵. Seven studies from four different geographic areas (Massachusetts^{6,7}, Illinois^{8,9}, Minnesota¹⁰ and Alberta^{11,12}) found significant underage participation in legalized gaming, especially lotteries.

The objectives of this study were to determine the prevalence of disordered gambling behavior, the average age of onset of gambling behavior, and the co-occurrence of gambling disorders with frequent substance use, within the Louisiana student population grades 6th -12th.

Methodology:

Demographic, alcohol, nicotine, and drug-use questions were added to the core instrument, the South Oaks Gambling Screen, Revised for Adolescents (SOGS-RA)². The questionnaire was pilot-tested on adolescents in residential placement at five sites prior to school distribution. The school sample consisted of 3 1/2% of registered students within each parish in 6th-12th grades in public and non-public schools based on the 1996-1997 Louisiana School Directory, with 445,000 enrolled¹³. Subjects were selected by grades, yielding a possible total sample of 15,575. Classrooms within each grade were randomly selected by matching the last two digits of their Louisiana School Code¹⁴ with the first two digits on a table of random numbers. A total of 698 classrooms were identified among 585 schools throughout Louisiana's 64 parishes. Written approval for study participation was obtained from parish school superintendents and private school principals from 57 of the 64 parishes, representing 565 classrooms in 470 schools. Parish superintendents were asked to supply the teacher's name with the most years of experience, and the estimated number of students within the identified classroom(s). Questionnaires for each classroom were enumerated; survey codes were recorded, and the survey packet containing a letter of instruction were mailed to the identified teachers. Teachers were instructed to administer the questionnaires under test-taking conditions.

A total of 12,066 questionnaires were returned and hand-coded with appropriate school and parish codes. Prior to automatic scanning, questionnaires were inspected for stray marks. During quality control measures 330 instruments were either miss-fed or contained incomplete data were removed, leaving 11,736 questionnaires for statistical analyses.

Statistical Analysis:

Confidence intervals are ranges within which there is a 95% probability of capturing the true mean, or estimate, of the population (95% CI). Confidence intervals were calculated by multiplying the standard error of the mean by the z score for 95% probability, to produce a maximal error of tolerance for means or a maximal error for proportions (margin of error). The tolerance factor was subtracted from, then added to, the statistic to obtain the lower and upper limits.

Chi-square analyses (χ^2) were performed on discrete categorical data. One-way analyses of variance (E) were employed when continuous responses were compared by categories along a single dimension. Only p-values (p) less than or equal to 0.05 are reported as statistically significant. *Add multi-variant analysis methodology*

Results:

The sample consisted of more females (53.4%) than males (46.5%;n=11,637). Public schools provided 86%, and private, 13.9%, of the sample. Racial distribution was: Caucasian 53.7%, African American 34.4%, other 5.1%, Native American 2.3%, Hispanic 2.2% and Asian 1.8%. Significantly more males (89.7%) than females (82.5) (χ^2 (1df)=142.05,p<0.001), and private (88.5%) more than public school students (85.7%) reported that they had “ever gambled” than would be expected by chance (χ^2 (1df)=14.11,p<0.00).

Frequency and Types of Gambling Behavior:

Lifetime prevalence of gambling behavior was 86%. Table Two depicts lifetime and past-year prevalence rates for participation in various gambling activities. Results indicated that gambling is widespread among Louisiana adolescents.

Table Two**Lifetime and Past-Year Prevalence: Student Participation
in Gaming Activities Sorted by Licensed and Unlicensed Status**

Licensed Gaming Activity	% Lifetime	Lifetime 95% CI	Past-Year Rate Monthly or More
Played scratch off lottery tickets	65.3	63.3-67.3	31.8
Played bingo for money	36.3	34.3-38.2	13.1
Played the lotto	33.0	31.4-34.6	17
Played video poker	24.9	23.7-26.2	10.6
Played slot or keno machines	17.5	16.4-18.6	6.4
Bet on horse or dog races	10.3	9.4-11.3	3.8
Gambled at a land based casino	6.7	6.1-7.4	2.1
Gambled at a riverboat casino	5.5	4.9-6.0	1.6

Unlicensed Gambling Activity	% Lifetime	Lifetime 95% CI	Past-Year Rate Monthly or More
Played cards for money	52.0	50.2-53.7	23.8
Bet on sports teams	45.4	43.8-46.9	24.1
Bet on games of personal skill like pool, golf, bowling, dominos	38.2	36.6-39.7	20.8
Played dice games (such as craps or over and under)	32.5	30.8-34.1	17.4
Flipped coins for money	30.4	28.7-32.2	14
Bet on sports pools	19.1	17.7-20.5	7.8
Played POGS for money	11.1	9.9-12.3	5.2
Placed a bet with a bookie	6.8	6.2-7.6	3
Bought or sold "Intent or Chase" cards	6.6	5.9-7.3	2.9

Prevalence of Disordered Gambling:

Table Three shows percentage distribution of 11,637 students whose SOGS-RA scores could be calculated into Levels 2 and 3 gambling behaviors *by grade*. Level 2 problem gambling was found in 10.1% (n=1176;95%CI:9.55-10.64%) and Level 3 pathological gambling was found in 5.8% (n=667;95%CI: 5.27-6.11%) of students. Significantly more males (12.75%) than females (7.8%) indicated Level 2 gambling behavior ($X^2(2df)=322.77, p<0.00$), and significantly more males (9.2%;95%CI:8.08-10.34%) than females (3%;95%CI:2.44-3.57%) indicated Level 3 gambling behavior, than would be expected by chance ($X^2(2df)=14.9, p<0.00$). Significantly more students who attended public schools (Level 2=10.1%, Level 3=6%) showed disordered gambling behaviors than did those who attended private schools (Level 2=9.72%; Level 3=4.3%) than would be expected ($X^2(2df)=14.9, p<0.00$).

**Percentage of Students with Level 2 and Level 3
Gambling Behavior by Grade**

Grade Level in School	Percentage Level 2	95% Confidence Interval	Percentage Level 3	95% Confidence Interval
6	10.3	9.8-10.9	4.9	3.8-6.1
7	11.8	11.3-12.4	8.1	6.1-10.0
8	12.2	11.6-12.4	7.7	5.9-9.4
9	9.9	9.4-10.5	6.0	4.4-7.6
10	9.8	9.3-10.4	5.5	3.9-7.2
11	7.4	6.9-7.9	3.6	2.5-4.8
12	7.6	7.1-8.0	4.5	2.8-6.2

Level 3 gambling, distributed by self-identified racial affiliation was as follows: Hispanic 9.4% (95%CI:4.21-14.46%); Asian 7.8% (95% CI: 3.50-12.08%); African American 7.7% (95%CI:6.50-8.84%); Native American 6.5% (95%CI:1.35-11.61%); other 6.2% (95%CI:3.27%-9.16%); Caucasian 4.6% (95%CI:3.85-5.40%). Based on the distribution of the sample, frequency of African Americans, followed by Hispanics, with Level 3 gambling behavior was significantly greater, and that of Caucasians was significantly lower, than would be expected by chance ($X^2(10df)=105.69, p<0.00$).

Co-morbidity of Gambling, Alcohol, Smoking, and Drug Use:

Lifetime prevalence rates for gambling exceeded lifetime prevalence for alcohol use (64.3%;n=7544), tobacco use (54.5%;n=6399), marijuana use (28.3%;n=3316), and use of drugs other than alcohol or marijuana (25%;n=2931). Disordered gambling rates (Level 2 + Level 3=15.7%) exceeded past-year prevalence for those who drank alcohol weekly or more often (9.72%;n=1141) or used drugs other than alcohol monthly or more (13.5%;n=1582). Past-year prevalence of some forms of illegal gambling (see Table Two) exceeded daily alcohol consumption, monthly or more drug use, and daily cigarette smoking (28.4%;n=3329). Disordered gambling co-occurred in

59% of students who drank alcohol or used other illicit drugs weekly or more. However, disordered gambling occurred in 41% of students who did not admit to any alcohol or other illicit drug use.

Overall, average age of onset was 11.2 for gambling behavior, 11.3 for alcohol consumption, 11.6 for smoking, and 13.2 for marijuana use. Table Four presents a summary of the ages of onset for gambling, drinking alcohol, smoking tobacco, and marijuana use, with anticipated grade levels for mean age. One-way analysis of variances on age of onset by gender indicated males gambled (mean=10.88males,11.22 females;n=7398;F(1,7326)=26.51,p<0.000), drank alcohol (mean=11.75 males,10.78 females;n=7320; F (1,7318)=169.89,p<0.00), smoked tobacco (mean=11.2 males,11.9 females;n=6159; F (1,6157)=114.67, p<0.00), and used marijuana (mean=12.8males, 13.6females;n=3171;F (1,3142) =77.72,p<0.00), at significantly earlier ages, on average, than did females.

There was insufficient evidence to conclude that students differed in mean age of onset of gambling (11.06, 11.03 years), alcohol use (11.35, 11.29 years), or marijuana use (13.2, 13.2 years) by private or public school enrollment, respectively. Responses did indicate that students in public schools began

smoking earlier (11.5 years), on average, than did those in private schools (11.9 years) ($F(1,6219)=89.66, p<0.0005$).

Table Four

**Summary Table of Age of Onset for Males and Females
With Anticipated School Grade for Representative Age**

Activity	Males		Females	
	Age of Onset Years	Anticipated Grade in School	Age of Onset Years	Anticipated Grade in School
Gambling	10.9	5 th	11.2	5 th
Drinking alcohol	10.8	5 th	11.8	6 th
Smoking tobacco	11.2	5 th	11.9	6 th
Use marijuana	12.8	7 th	13.6	8 th

**** Add Multi-variant analysis****

Discussion:

Gambling behavior is widespread in the Louisiana student population. This survey's lifetime prevalence of 86% is within the range reported by Shaffer and Hall⁴ (75%-92%). Lifetime gambling prevalence is consistently high across grade levels. This trend indicates a strong tendency toward gambling experimentation behavior prior to middle school.

The survey found the overall prevalence of gambling disorders in students was consistent with previous studies³ (see Table One). Gambling disorders were more prevalent than monthly or more drug use and drinking weekly or more often in this sample. Disordered gambling prevalence (Level 2 plus Level 3) was consistently high across grade levels, ranging from a low of 11.0% in 11th grade to a high of 19.2% in 8th grade.

Disordered gambling behaviors (Level 2 and 3) were statistically more common in male students. Furthermore, Level 3 pathological gambling behavior was statistically more common for African Americans and Hispanics and less likely in Caucasians. This is consistent with adult prevalence surveys in New Jersey, New York, Maryland, Massachusetts¹⁵, and Louisiana¹⁶, which found that minority males were more likely to be identified as pathological gamblers than Caucasians.

Disordered gambling (Table 3) appeared at higher percentage rates until age 15 and 16, then seemed to taper off. One explanation for the decrement in gambling disorders might be that gambling disorders begin to decrease at age 16. Another, more probable, explanation is that gambling disorders negatively affect school performance, decrease attendance, and increase risk of dropping out of school,

and therefore are not included in the sample. This is supported by the adult prevalence surveys previously referenced ^{15,16} which found that pathological gamblers were more likely to be high school dropouts.

Data from this survey indicates the need for effective school-based gambling disorder prevention programs. The age of onset of gambling behavior, found in this study, 11.2 years, suggests that school-based primary prevention programs, whose goal is to delay onset of gambling behavior until adulthood, should be targeted to Louisiana elementary grade-school student's 3rd-6th grades. School-based secondary prevention programs, whose goal is to identify students with gambling disorders and intervene to minimize development of life-long behavior problems and complications, would be appropriate from 6th-12th grades.

Non-school-based prevention programs that increase the legal gambling age to 21, and enforce current age restrictions on lottery sales, video poker and casino gambling to reduce accessibility, are indicated. Finally, more research on student attitudes about gambling risks and accessibility of various types of gambling to students is needed to develop evidence-based prevention programs.

Conclusions:

- (1) Gambling behavior is widespread in Louisiana students;
- (2) gambling experimentation behavior usually begins in 5th grade and precedes other experimentation behaviors such as smoking tobacco, marijuana and alcohol use;
- (3) disordered gambling behavior is prevalent from 6th-12th grades,
- (4) although the majority of students with gambling disorders use alcohol and other illicit drugs regularly, gambling disorders are not limited to those students.
- (5) primary prevention of gambling disorders should be targeted to 3rd-6th grade, and secondary prevention should target 6th-12th grades.

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