

Patterns and Characteristics of Adolescent Gambling

Ken C. Winters, Ph.D.
Randy Stinchfield, Ph.D.
Jayne Fulkerson, M.A.
University of Minnesota

Minnesota youth (15 to 18-years of age) were surveyed regarding their gambling experiences and psychosocial risk status. Gambling was reported by most of the subjects, with 8.7% classified as problem gamblers. Correlates of problem gambling included school difficulties, regular drug use, delinquency, parental gambling, and being male. Adolescent gambling is conceptualized as a normal experience of youth, yet those in the problem gambling group may be particularly vulnerable to future gambling problems.

As the popularity and interest in legalized gambling grows in this country (e.g., Eadington, 1989), greater attention is being directed to the public health risks that accompany America's newfound leisure activity. Recently, several adult surveys in the United States have been conducted to determine the prevalence and nature of problem gambling (e.g., Laudergeran, Schaefer, Eckhoff, & Pirie, 1990; Volberg & Steadman, 1988, 1989, 1992). Prevalence rates of pathological

The authors would like to express their gratitude to the Minnesota Department of Human Services for their funding support of the study and to several colleagues, particularly Linda Harris, J. Clark Laudergeran and Durand Jacobs, and anonymous reviewers for their helpful comments.

Send reprint requests to Ken C. Winters, Box 721, University of Minnesota, Harvard Street at East River Road, Minneapolis, MN 55455.

gamblers have been estimated by these various studies to be about 1%–3%, with males, nonwhites and those with less than a college education generally over represented in this group. Not surprisingly, treatment programs for adult pathological gamblers are beginning to surface in parts of the country outside of Atlantic City and Las Vegas (e.g., Minnesota).

The nature of adolescent gambling has begun to receive research attention since the mid-1980's. What is known is that despite gambling activities being illegal for adolescents, they remain a popular recreation outlet for youth. A study in the Atlantic City area indicated that over half of high school students had gambled in casinos (Arcuri, Lester & Smith, 1985). Lesieur & Klein (1987) found that 91% of almost 900 junior and senior high school students in New Jersey reported having gambled at least once in their lifetime, while 86% reported gambling in the past 12 months. Jacobs (1989) reviewed three of his high school surveys and a Connecticut high school survey (Steinberg, 1988, May; cited in Jacobs, 1989) and estimated that approximately 7% of them met DSM-III criteria for pathological gambling. Fisher (1992) found that 9% of children in the U.K. (11- to 16-years-old) who reported gambling on fruit (slot) machines, which is legally available to children, met adolescent-revised DSM-IV criteria for "probable pathological gamblers." Other studies of high school students in Quebec City (Ladouceur & Mireault, 1988) and England (Ide-Smith & Lea, 1988) and of college students (e.g., Frank, 1988) also indicate that the majority of youth gamble and that some encounter gambling-related problems. Generally speaking, data from surveys in the United States indicate that card games, sports betting, and betting on games of personal skill are the most common forms of adolescent gambling.

Estimating the prevalence of problem or pathological gambling among adolescents has proved to be a research challenge. The availability of gambling options (e.g., lotteries, pull tabs, and scratch tabs) is likely to greatly affect the prevalence rates (Jacobs, 1989). Also, there are measurement issues. Usually researchers have applied adult based criteria and scales to adolescents without certainty of their validity in youth samples. These measures include formal diagnostic criteria (e.g., the Diagnostic and Statistical Manual, third edition; American Psychiatric Association, 1980), Gamblers Anonymous questions and the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987).

The present study builds on existing knowledge of the prevalence of adolescent gambling by employing a state-wide sampling procedure. Previous adolescent surveys may not be very representative of youth in general because they are based on limited high school data. Among other reasons, the high school sampling approach can produce a biased sample because school dropouts are not included in the sample pool and participating high schools may not be representative of youth. In the present study, comparisons between groups defined by gender, age and geography, as well as psychosocial correlates of adolescent gambling, will be examined.

METHOD

Subjects

The study involved surveying by telephone an older adolescent (15 to 18-years-old) sample from Minnesota. The sample ($N = 702$) was drawn from a targeted state-wide phone list of households likely to have adolescents in residence. The list was prepared by a market research firm, and was compiled from school information, results from previous market research by the firm, and state driver and voter registration records. Among the 910 eligible families (i.e., at least one 15 to 18-year-old in residence) contacted, 77.1% of adolescents (and a parent) consented to participate in the study. The sample was about equally distributed across age (mean = 16.2), gender, (49.3% female), and locale (metropolitan, 49.4%; rural, 50.6%). However, the sample was predominantly white (97.4%). In terms of family composition, 71.5% reported living with both biological parents, 14.7% with a single parent, and 13.8% with other combinations of adults or with no adults.

Because the study design relied on a targeted telephone list and not a random digit-dial procedure (the latter strategy being prohibitively expensive given the study's resources), it is important to consider the representativeness of the study sample. A post-hoc analysis was conducted to statistically evaluate the representativeness of the study sample to Minnesota youth in general. The sample's distribution of subjects with respect to locality (metropolitan vs. rural), gender,

ethnicity (white vs. non-white), and family situation (living with both biological parents vs. living with single parent) was compared to 1988 Minnesota census data of adolescents. Chi-square tests indicated there were no between-group (telephone sample vs. state census data) differences on any of these demographic variables, suggesting that the targeted telephone list was representative of Minnesota youth of similar age.

Materials

Subjects were administered a telephone questionnaire specifically designed for a gambling prevalence study. Questionnaire item development began by reviewing the relevant literature on adolescent and adult gambling and reviewing existing adolescent health surveys (e.g., Blum & Resnick, 1987). Also, gambling research experts were consulted to provide advice on content areas and methodology. Next, a large item pool was written in an effort to represent a broad range of variables associated with gambling problem severity and related inter- and intra-personal and familial psychosocial factors. Questionnaire items can be categorized into six content groups: extent and pattern of participation in gambling activities; onset characteristics; signs and symptoms of gambling problem severity; gambling attitudes and benefits; psychosocial risk factors believed to be precursors or maintenance variables; and demographic characteristics. Because the sample was to be re-contacted at a later date as part of a longitudinal study, many items were cast in a 12-month time frame (e.g., During the past year, how often . . .).

The origin of the items pertaining to the signs and symptoms of gambling problem severity merits further discussion. A well-known adult scale, the South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987), has received extensive research attention (see Lesieur & Blume, 1993). While the SOGS has impressive psychometric properties, its use in adolescent samples has been limited. Thus, the authors felt there was a need to slightly revise the SOGS for this study. Adaptations involved minor changes in the wording of some items and response options to better reflect adolescent gambling, and the scoring rule for original item #16 was adjusted. Finally, to accommodate a planned follow-up study, all scored SOGS items were cast in a one-year, rather than lifetime, time frame, and item #1 was cast in both a

lifetime and one-year time frame. A description and psychometric properties of the revised adolescent SOGS (known as the SOGS-RA) can be found in an earlier issue of this journal (Winters, Stinchfield and Fulkerson, 1993). Briefly, the scale consists of twelve problem severity items, has an estimated coefficient alpha of .80, and correlates .54 with past year gambling frequency (Winters, et al., 1993). Endorsement rates (% yes responses) among gamblers in the present sample ranged from 1.2% (#9) to 15.4% (#10).

The full telephone questionnaire went through several revisions: Redundant items were discarded; wording was refined to accommodate adolescent comprehension levels and improve the ease of administration; and simple response options were developed (e.g., yes/no; strongly disagree/disagree/agree/strongly agree). Explicit coding instructions were provided for the telephone interviewers to facilitate a standardized administration.

Procedure

As noted earlier, youth were surveyed by telephone. The sample was identified by randomly selecting household names from one of two lists of 2,000 names each. One list contained rural households and the other list consisted of metropolitan (greater Minneapolis and St. Paul metropolitan area) households. It was decided to sample rural and metropolitan residents equally so that (a) this factor on adolescent gambling could be examined and (b) an estimate could be made of the state-wide adolescent gambling picture (Minnesota's youth population is roughly divided evenly between metropolitan and rural settings).

Interviewers recorded all telephone calls on a log sheet. The log form documented the number and dates of calls to a household, whether call-backs should occur (i.e., busy signal, no answer, or teenager not home), and reasons for non-completed interviews (e.g., no teenager of appropriate age in residence; parent or adolescent did not consent; no contact after 10 calls over the course of several days).

Due to time constraints and budget limitations, the telephone survey was terminated after 910 eligible households (i.e., at least one residing adolescent within the target age) were contacted. The refusal rate among the contact group was 24.6%. In all but two instances, the refusals were due to the parents unwillingness to grant consent; the other two refusals were expressed by the adolescent. No demographic

characteristics were available concerning the refusal group except locality. In this regard, the refusal rates did not statistically vary based on rural versus metropolitan status.

Statistical analysis included descriptive statistics of gambling involvement variables, and chi-square and Student *t*-tests to evaluate the statistical significance of group differences.

RESULTS

Lifetime and Past Year Gambling Pattern

Pattern of lifetime and past year gambling was measured for eleven activities (Table 1). Playing cards for money had the highest lifetime prevalence rate (50.0%), followed by three other activities that exceeded a prevalence rate of one third: betting on games of personal skill (42.6%), betting on sports teams (38.8%), and playing scratch tabs (36.8%). As for gambling abstinence, 14.2% of the sample reported no history of any gambling (8.5% for males, 19.7% for females, $X^2(1,691) = 17.8, p < .001$).

An examination of past year regular (i.e., weekly or more often) gambling patterns indicated that scratch tabs (6.4%), betting on games of personal skill (6.2%), betting on sports teams (5.9%), and cards (4.6%) had the highest prevalence rates. The other gambling activities had prevalence rates less than 2%. Thus, the gambling activities that were played weekly or more often within the past 12 months were similar to the high prevalence lifetime activities. Furthermore, a count was computed of the number of gambling activities played weekly or more often during the past year (range, 0-11). While the majority of respondents (81.3%) did not report any gambling at this level within the past year, reports of regularly playing one, two, three and four or more games were 12.2%, 4.3%, 1.3%, and 0.9%, respectively.

Onset Activities

Percentages computed for onset activities were based on subjects who had gambled within the past year (85.8% of the sample). Playing cards for money (30.2%) was the gambling activity most often played first by gamblers, followed by bingo (14.8%), betting on sports teams

Table 1
Prevalence of Gambling, Lifetime and Past Year (N = 702)

	<i>Lifetime</i> %	<i>Past Year</i> %
Cards	50.0	46.9
Betting on Games of Personal Skill	42.6	40.0
Betting on Sports Teams	38.8	36.5
Scratch Tabs	36.8	35.0
Bingo	32.1	26.2
Pull Tabs	21.7	19.0
Coin Flipping	16.3	15.1
Dice Games	16.1	15.0
Lottery	15.1	13.8
Gambling Machines	11.8	8.8
Betting on Horse or Dog Races	12.1	9.5
Abstinence	14.2	—

Source: Survey of Minnesota adolescents.

(13.3%), betting on games of personal skill (10.9%), playing pull tabs (7.6%), and playing scratch tabs (5.9%). The other activities (dice games, coin flipping, lotteries, gambling machines, and betting on horse or dog races) had onset percentages ranging from 4.1% to 2.6%. Males were more likely to begin gambling by playing cards (37.1%), while females had equal onset preferences for cards (21.8%) and bingo (21.4%).

Gender and Locality

To examine gender and locality differences, three gambling involvement variables based on SOGS-RA item 1 were compared: lifetime count (0–11) of gambling activities played at least once; highest level of gambling within the past year (0 = never played; 5 = daily); and count (0–11) of “regular” gambling (0 = monthly or less often; 1 = weekly or more often). A between group analysis indicated that males scored higher than females on all three variables: lifetime count, $t(693) = 6.46$, $p < .001$ ($\eta^2 = .24$); past year gambling, $t(675) = 8.26$, $p < .001$ ($\eta^2 = .28$); and count of regular gambling,

$t(693) = 5.45, p < .001$ ($\eta^2 = .20$). Between group differences based on locality (metropolitan versus rural) were nonsignificant for these variables.

Problem Severity Groups

The authors began with the assumption that no definitive, well-established definition of adolescent gambling problem severity exists. It was decided to adapt an approach commonly employed in the adolescent substance abuse literature in which use patterns and negative consequences are combined to identify levels of severity. Gambling problem severity groups were defined, therefore, by first examining the separate distributions of SOGS-RA scores for the gambling frequency items (#1) and for the signs and symptoms items (#5–#16). Next, single cut points were drawn within each distribution of scores that identified high-low subgroups. Three relatively distinguishable groups were formed, as follows:

No Problem Gambling—No history of gambling; or gambling within the past year less than weekly and SOGS-RA score of 0.

At Risk Gambling—Weekly or daily gambling and SOGS-RA score of 1; or gambling less than weekly and SOGS-RA score of 2+.

Problem Gambling—Weekly or more often gambling, and SOGS-RA score of 2+; or daily gambling, regardless of SOGS-RA score.

The group designations are not meant to reflect formal diagnostic terms (e.g., pathological or compulsive gambling). Given the limited knowledge about adolescent gambling and the lack of understanding as to what constitutes pathological gambling at younger ages, use of general descriptive, nondiagnostic labels seems appropriate at this time. To summarize, these progressive problem severity designations are defined with criteria that reflect (a) abstinence from gambling or very low-levels of gambling not accompanied with problem symptoms (no problem), (b) weekly or more often gambling and the presence of at least some signs or symptoms that theoretically are linked to adult problem gambling (problem), or (c) a milder form of gambling severity that may represent an increased risk to develop problems in the future (at risk).

Prevalence of Problem Severity Groups

As shown in Table 2, the prevalence of the problem severity groups for the total sample was as follows: problem gambling, 8.7%; At Risk Gambling, 17.1%; and no problem gambling 74.2%. Problem severity group distribution was statistically different based on gender. Proportionally more males were in the problem gambling group (15.1%) than females (2.4%), $X^2(2,691) = 54.4$, $p < .001$ ($\eta^2 = .28$). However, there were no significant associations between locality and age groups and the distribution of problem severity groups.

Grade of Onset

Grade of onset was investigated because of its history as a behavioral marker for other adolescent problems, such as drug abuse (e.g., Johnston, Bachman, & O'Mally, 1992). The grade level at which respondents began gambling was significantly related to problem severity group membership, $X^2(4,571) = 27.9$, $p < .001$ (Somers's $d = -.15$). For the no problem group, 32.2% showed early (i.e., grade six or before) gambling onset; these proportions increased to 37.9% and 50.8% for the at risk and problem gambling groups, respectively.

Table 2
Prevalence of Gambling Problem Severity Groups (N = 702)

<i>Sample Characteristics</i>	<i>No Problem Gambling %</i>	<i>At Risk Gambling %</i>	<i>Problem Gambling %</i>
Total	74.2	17.1	8.7
Males	62.7	22.2	15.1
Females	85.6	12.1	2.4
Rural	76.1	16.8	7.1
Metropolitan	72.4	17.3	10.3
15-year-olds	69.9	20.5	9.6
16-year-olds	80.2	13.6	6.2
17-year-olds	75.9	16.0	8.0
18-year-olds	69.2	19.8	11.0

Source: Survey of Minnesota adolescents.

Moreover, the percentages of "late" (i.e., grades 10–12) onset gambling decreased as a function of increased problem severity group membership: no problem, 24.9%; at risk gambling, 10.3%; and problem gambling, 1.6%.

Amount of Money Gambled

There was a significant relationship between the amount of money gambled and problem severity level, $X^2(2, 560) = 110.6, p < .001$ (Somers's $d = .74$). Among problem gamblers, 35.0% reported spending \$200 or more on gambling during the past 12 months, while only 7.8% of the at risk gamblers and 0.8% of the no problem gamblers indicated spending this much over the same time period.

Activities Played by Problem Gamblers

Table 3 presents the pattern of recent gambling among the problem gamblers. Four activities were played on a weekly or daily basis by approximately one-third or more of problem gamblers: cards (36.1%), betting on games of personal skill (44.3%), scratch tabs (30%), and betting on sports teams (37.7%). The other games were played at this frequency level with much lower prevalences (range: gambling machines, 0%, to coin flipping, 14.8%). However, the findings in Table 3 indicate that the preferences for gambling among problem gambling youth are similar to the pattern of preferences found in the full sample

Psychosocial Factors

Several psychosocial variables have been linked by other researchers to adolescent gambling (e.g., Jacobs, 1989). These personal and environmental factors may precipitate gambling involvement, predispose individuals to become gamblers, or serve as maintenance factors by way of reinforcing continued gambling. The present study used a chi-square analysis to examine the association between problem severity groups and thirteen psychosocial factors. No significant associations were found between group membership and family composition (two parent household vs. single parent household), family closeness

Table 3
Recent Gambling Patterns
in the Problem Gambling Group (N = 61)

<i>Gambling Activity</i>	<i>Not in Past Year %</i>	<i>Less than Monthly %</i>	<i>Monthly %</i>	<i>Weekly/Daily %</i>
Cards	6.5	22.6	34.4	36.1
Betting on Games of Personal Skill	13.1	11.5	31.1	44.3
Betting on Sports Teams	26.2	11.5	24.6	37.7
Scratch Tabs	40.0	5.0	25.0	30.0
Coin Flipping	59.0	8.2	18.0	14.8
Pull Tabs	62.3	11.5	21.3	4.9
Dice Games	62.3	14.8	13.1	9.9
Lottery	67.2	4.9	16.4	11.5
Bingo	67.2	24.6	6.6	1.6
Betting on Horse or Dog Races	77.0	11.5	6.6	4.9
Gambling Machines	83.6	8.2	8.2	0.0

Note: The rank order of gambling activity in the table is based on the most-to-least frequent activity played during the past year.

Source: Survey of Minnesota adolescents

(close vs. not close), personal satisfaction (happy vs. unhappy), psychological distress (anxious vs. not anxious), physical health (good vs. poor), signs of eating disorder (positive vs. negative), employment status (employed vs. unemployed), and personal weekly income (low vs. middle vs. high).

However, problem severity group membership was significantly related to five psychosocial characteristics: history of parental gambling, heavy parental gambling, delinquency, regular drug use, and school performance. The majority of subjects in the problem and at risk gambling groups, 79.7% and 65.8%, respectively, reported that one or both of their parents gamble, compared to about half (51.8%) of the youth in the no problem group, $X^2(2,670) = 21.4$, $p < .001$ (Somers's $d = .16$). Furthermore, a moderate association was found between problem severity group membership and the youth's report of heavy parental gambling: 6.3% problem gambling, 3.8% at risk

gambling, and 1.4% no problem gambling, $X^2(2,413) = 4.8$, $p < .05$ (Somers's $d = .32$). As for adolescent school performance and gambling, a significant association was found in the distribution of youth who reported average-to-below average school grades and problem severity group: 47.5%, problem gambling; 37.0% at risk gambling; and 23.2% no problem gambling, $X^2(2,682) = 21.7$, $p < .001$ (Somers's $d = .19$). Stronger associations occurred for the other two factors. For delinquency status, defined as either admitting to participating in any illegal activity (other than gambling) or ever having been arrested for something other than a traffic offense, the distribution among the gambling groups was: 63.9% problem gambling, 50.0% at risk gambling, and 27.4% no problem gambling, $X^2(2,693) = 47.3$, $p < .001$ (Somers's $d = .24$). Drug use level was defined as the highest frequency of use among tobacco, alcohol, marijuana or amphetamines. The prevalence of monthly or more often drug use was significantly linked to gambling status: 62.3% problem gambling, 51.3% at risk gambling, and 27.7% no problem gambling, $X^2(2,697) = 46.2$, $p < .001$ (Somers's $d = .24$).

DISCUSSION

From one perspective, the survey results suggest that gambling is not a problem for most youth. While it is common for adolescents to gamble at least once prior to age 15, the majority who reported some gambling history indicated an infrequent pattern, a low amount of money spent, and an absence of problem signs and symptoms. These findings support the view that gambling is a typical behavior of adolescence, practiced in moderation (or not at all) by most teenagers. Perhaps the observation that gambling and adolescence seem to go hand in hand should not be too surprising. Adolescence is typically a time for experimentation. Involvement in gambling, like sex and drugs, may be a behavioral expression of the experience of adolescence. Furthermore, one cannot dismiss the possibility that youth perceive gambling as potentially profitable and a low-risk activity.

The results of the study also suggest that adolescent gamblers generally prefer cards, bingo, betting on games of personal skill, betting on sports teams, pull tabs and scratch tabs. While some of these activities appear benign and recreationally-oriented, participation in

legal games, such as pull tab and scratch tab gambling, likely requires either adult involvement or illegal acquisition by the teenager from a vendor. In Minnesota, pull and scratch tab playing are relatively new games and so it is possible that once their novelty fades, their popularity among youth will likewise wane. Nevertheless, how underage youth gain access to legalized gambling is a topic that merits further study. Also, it is important to keep in mind that because the survey was conducted prior to Minnesota's participation in Lotto America, the full popularity of the lottery is not reflected in the current survey. Those who reported lottery playing would have participated in a non-Minnesota lottery, such as in the surrounding states of Iowa and Wisconsin.

Findings from the study revealed that a small, but appreciable, percentage of subjects were categorized as more than casual or recreational gamblers. The problem and at risk gambling groups, defined according to the degree of recent participation in gambling activities and the presence of signs or symptoms that reflect negative consequences of gambling, are conceptualized in this study to represent pre-clinical states. Their degree of association to future, and perhaps more serious, gambling problems will require a prospective study. Because adult pathological gambling is viewed as a progressive clinical condition (e.g., Custer, 1982), it may be that adolescent problem gamblers are the most vulnerable group to develop a compulsive gambling condition. The likelihood of developing a continued gambling problem will probably be affected by the impact of liabilities (e.g., psychosocial risk factors) and assets (e.g., personal resources; prevention and treatment). The significant association between some of the psychosocial factors and gambling problem severity suggests a need to further study how assets and liabilities prospectively influence gambling involvement and resulting problems.

Several demographic and psychosocial correlates of adolescent gambling were identified in the study. Greater gambling involvement and higher problem severity scores were found among males, regular drug users, and youth with a history of delinquency, poor grades, and those whose parents gamble. These findings are generally consistent with existing literature (e.g., Jacobs, 1989). Heavy gambling among Minnesota youth appear to be related to delinquent-like and acting-out behaviors (i.e., drug use, illegal acts, poor school performance), and to parental gambling. The link between delinquent behaviors and

problem gambling is remindful of Jessors' problem behavior theory of adolescent alcohol abuse (Jessor & Jessor, 1977). The Jessors hypothesized that several problem behaviors cluster together during adolescence, including delinquency and alcohol abuse. The present study suggests that heavy gambling may be an appropriate addition to the cluster of adolescent problem behaviors. As for the association between parental gambling and adolescent gambling, family studies will be needed to clarify how parents contribute to youthful gambling (e.g., parents serve as gambling role models; parents facilitate the youth's access to state-sanctioned gambling). A recent experimental study of children indicated that modeling can influence children in tasks that involve taking risks and which mimic gambling situations (Kearney & Drabman, 1992).

Gambling patterns and levels of problem severity among Minnesota youth were found to be generally comparable to national findings. Other surveys have documented the popularity of gambling among youth (as high as 90% involvement), and the national prevalence rate of adolescent pathological gambling has been estimated to be about 7% (Jacobs, 1989). Two methodological issues, however, need to be considered when interpreting the results of the present study. First, as noted earlier, the authors purposely avoided using terms like pathological or compulsive gambling to characterize the study's most severe gambling group because formal diagnostic criteria were not applied to the study sample. Therefore, it may be imprudent to draw a simple parallel between the present study's 8.7% prevalence rate of problem gambling youth and the roughly 7% prevalence rate of pathological adolescent gambling cited by others (e.g., Jacobs, 1989). Obviously, future epidemiological research on adolescent gambling would benefit from the use of similar measures, as well as future investigations of the diagnostic significance of various cut points on the SOGS-RA.

The second methodological issue is whether the telephone strategy yields valid data. Methodological studies on this topic generally conclude that the telephone interview method is valid (e.g., Sabin & Godley, 1987). For the present study, telephone disclosure rates were compared post-hoc to disclosure rates obtained when the same questionnaire was administered to an in-school sample ($N = 410$) of Minnesota youth in grades 10–12. The school sample was identified from three urban and one rural high schools that consented to participate in a gambling survey. Students were administered the gambling

questionnaire in a group setting and no self-identifying information was recorded on the questionnaires. Disclosure rate comparisons were computed for items related to self-disclosure of deviance or personal problems: tobacco use, alcohol use, marijuana use, other drugs use, average school grade, personal life satisfaction, physical health, participation in illegal activities, psychological distress, eating disorder, and family closeness. A between-group (t-test) analysis indicated that disclosure rates between the telephone and paper-and-pencil samples did not reach statistical significance on any target variable, although significance was nearly reached for illegal activity (the disclosure rate was lower in the telephone sample).

Future research would benefit from a longitudinal study of adolescent gambling. Whether increased gambling opportunities, such as lotteries, lead to proportional increases in first-time gamblers and youth problem gamblers is an important question. Additional research may help explain the role of open-access games of chance, such as scratch tickets at fast-food restaurants or pseudo-lotteries (e.g., the "McMillions" contest promoted by McDonalds and the National Broadcasting Company) in the development of adolescent problem-level gambling. In addition, there is a need to clarify the interrelationships between gambling and psychosocial correlates of gambling. While the present study identified strong associations between gambling behavior and a group of delinquency-like factors, prospective studies can offer a clearer picture as to the extent these factors are operative in the development of compulsive gambling.

REFERENCES

- Arcuri, A.F., Lester, D., & Smith, F.O. (1985). Shaping adolescent gambling behavior. *Adolescence*, 20, 935-938.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual: Third edition*. Washington, DC: author.
- Blum, R.W. & Resnick, M. (1987). *Adolescent Health Survey*. Minneapolis, MN: Adolescent Health Program.
- Custer, R. (1982). An overview of compulsive gambling. In P.A. Caroué, S.F. Yoles, S.N. Kieffer, & L. Krinsky (Eds.), *Addictive disorders Update: alcoholism, drug abuse, gambling* (pp. 107-124). New York: Human Sciences Press.
- Eadington, W.R. (1989). Problem gambling and public policy: Alternatives in dealing with problem gamblers and commercial gambling. In H.J. Shaffer, S.A. Stein, B. Gambino, & T.N. Cummings (Eds.), *Compulsive gambling: Theory, research and practice* (pp. 175-186). Lexington, Mass.: Lexington Books.

- Fisher, S. (1992). Measuring pathological gambling in children: The case of fruit machines in the U.K. *Journal of Gambling Studies*, 8, 263-285.
- Frank, M.L. (1988). Casino gambling and college students: Three sequential years of data. Presented at the Third National Conference on Gambling Behavior, May 19-20, New York City, New York.
- Ide-Smith, S.G., & Lea, S.E.G. (1988). Gambling in young adolescents. *Journal of Gambling Behavior*, 2, 110-118.
- Jacobs, D.F. (1989). Illegal and undocumented: A review of teenage gamblers in America. In H.J. Shaffer, S.A. Stein, B. Gambino, & T.N. Cummings (Eds.). *Compulsive gambling: Theory, research and practice* (pp. 249-292). Lexington, Mass.: Lexington Books.
- Johnston, L., Bachman, J., & O'Malley, P. (1992). *Monitoring the future: Questionnaire responses from the nation's high school seniors, 1991*. Ann Arbor, Michigan: Survey Research Center, University of Michigan.
- Jessor, R., & Jessor, S.L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. New York: Academic Press.
- Kearney, C.A., & Drabman, R.S. (1992). Risk-taking/gambling-like behavior in preschool children. *Journal of Gambling Studies*, 8, 287-297.
- Ladouceur, R., & Mireault, C. (1988). Gambling behaviors among high school students in the Quebec area. *The Journal of Gambling Behavior*, 4, 3-12.
- Laudergan, J.C., Schaefer, J.M., Eckhoff, K.F., & Pirie, P.L. (1990). *Adult survey of Minnesota gambling behavior: A benchmark, 1990*. St. Paul, MN: Department for Human Services.
- Lesieur, H.R., & Blume, S.B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, 144, 1184-1188.
- Lesieur, H.R. & Blume, S.B. (1993). Revising the South Oaks Gambling Screen in different settings. *Journal of Gambling Studies*, 9, 213-223.
- Lesieur, H.R., & Klein, R. (1987). Pathological gambling among high school students. *Addictive Behaviors*, 12, 129-135.
- Sabin, M.C., & Godley, S.H. (1987). Mental health citizen surveys: A comparison of two within household telephone sampling techniques. *Evaluation and Program Planning*, 10, 137-141.
- Steinberg, M. (1988, May). *Gambling behavior among high school students in Connecticut*. Paper presented at the Third National Conference on Gambling, New York.
- Volberg, R.A., & Steadman, H.J. (1988). Refining prevalence estimates of pathological gambling. *American Journal of Psychiatry*, 145, 502-505.
- Volberg, R.A., & Steadman, H.J. (1989). Prevalence estimates of pathological gambling in New Jersey and Maryland. *American Journal of Psychiatry*, 146, 1618-1619.
- Volberg, R.A., & Steadman, H.J. (1992). Accurately depicting pathological gamblers: Policy and treatment implications. *Journal of Gambling Studies*, 8, 401-412.
- Winters, K.C., Stinchfield, R.D., & Fulkerson, J. (1993). Toward the development of an adolescent gambling problem severity scale. *Journal of Gambling Studies*, 9, 63-84.