

## **Prevalence Rates of Youth Gambling Problems: Are the Current Rates Inflated?**

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While there is a general consensus in the literature that it is common for youth to gamble, considerable variability in the reported prevalence rates of youth *problem* gambling has been found. More recently, issues concerning the possible overestimation of these rates have been raised. Arguments underlying the proposition that problem gambling rates for youth are inflated are examined. It is acknowledged that more rigorous research is required, including the need for the development and refinement of current adolescent instruments and screening tools, agreement upon a gold standard criterion for adolescent problem gambling, and clarity of nomenclature issues. The advancement of scientific knowledge concerning the underlying risk factors associated with the onset and course of youth gambling involvement and the role of effective adolescent prevention and treatment programs will require these fundamental research questions to be addressed.

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While there have been numerous reviews examining the prevalence rates of serious gambling problems among adolescents, several

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recent publications have questioned the validity of these reported rates (e.g., Ladouceur, 2001; Ladouceur, Bouchard, Rhéaume, Jacques, Ferland, Leblond, & Walker, 2000; Stinchfield, in press). More specifically, Ladouceur and his colleagues (2000) have argued that the current reported rates of serious gambling problems among adolescents are considerably inflated. The intent of this paper is to critically examine the validity of the arguments put forth which question the accuracy of these rates.

There remains considerable consensus in the research literature that gambling and wagering among youth is a relatively common and popular activity (Derevensky & Gupta, 2000a, 2000b; Jacobs, 2000; National Research Council (NRC), 1999; Stinchfield, 2000; Stinchfield & Winters, 1998; Shaffer & Hall, 1996). However, while there is a lack of consensus as to the actual prevalence rate of severe gambling involvement by adolescents (e.g., problem, compulsive, probable pathological, disordered, pathological, or Level III gambling), a number of large-scale meta-analyses and reviews have concluded that youth as a group constitute a high-risk population for gambling problems (Jacobs, 2000; NRC, 1999; Shaffer & Hall, 1996; Wildman, 1997).

#### **A BRIEF OVERVIEW OF THE PREVALENCE DATA**

Shaffer and Hall's (1996) early meta-analysis of prevalence rates of pathological gambling among youth in North America suggested that between 4.4% and 7.4% of youth, age 13 to 20, met the diagnostic criteria for pathological gambling. Studies included in the meta-analysis made use of a number of different screens including the Pathological Gambling Signs Index (Lesieur, Blume & Zoppa, 1986; Lesieur & Klein, 1987), Gambler's Anonymous 20 Questions (Gamblers Anonymous, 1957), SOGS-RA (Winters, Stinchfield, & Fulkerson, 1993), DSM-III, DSM-III-R and DSM-IV (American Psychiatric Association, 1980, 1987, 1995), and the Massachusetts Adolescent Gambling Scale (Shaffer, LaBrie, Scanlan & Cummings, 1994). More recently, several of our studies not included in Shaffer and Hall's original meta-analyses, yielded very similar rates (see Table 1).

The substantive data collected by the National Research Council (NRC, 1999), designed to assist the U.S. National Gambling Impact

**Table 1**  
**Reanalysis of Data on the DSM-IV-J**

<i>Study</i>	<i>Population</i>	<i>Instrument</i>	<i>Prevalence Rate</i>
Gupta & Derevensky, 1998a*	High school students (N = 817)	DSM-IV-J (4/9 criteria)	4.7%
Marget, Gupta, & Derevensky, 2000*	High school students (N = 587)	DSM-IV-J (4/9 criteria)	6.5%
Derevensky & Gupta, 2000a*	CEGEP students (N = 980)	DSM-IV-J	3.4%
		SOGS-RA	5.3%
		GA 20 Questions	6.0%
Nower, Gupta, & Derevensky, 2000*	CEGEP students (N = 1,339)	DSM-IV-J (4/9 criteria)	4.1%
Gupta & Derevensky, 2000*	High school students (N = 989)	DSM-IV-J (4/9 criteria)	6.7%
Derevensky & Gupta, 2001	High school students (N = 1,000)	DSM-IV-MR-J	3.4%
Ste-Marie, Derevensky, & Gupta, 2002	High school students (N = 1,044)	DSM-IV-MR-J	4.4%
Hardoon, Derevensky, & Gupta, 2002	High school students	DSM-IV-MR-J	4.9%

\*Reanalyzed using 4/9 criteria.  
H.S. students are in grades 7–11.  
CEGEP students are in grade 12 & 13.

Study Commission, noted after reviewing numerous studies that 73% (median value) of adolescents had gambled fairly recently. The NRC's investigators concluded that problem gambling (broadly defined) among adolescents' range between 7.7% to 34.9%, with a median of 15.5%. Based on a more narrow definition of pathological gambling,

the NRC estimated that the rate of pathological gambling among youth ranged from 1.2% to 11.2%, with a median of 5.0%. Acknowledging difficulties in comparisons of the data sets, they concluded that “the proportion of pathological gamblers among adolescents in the United States could be more than three times that of adults (5.0% versus 1.5%)” (NRC, 1999, p.89).

### **PERSPECTIVES ON THE PREVALENCE DATA**

Indeed, the wide variability of reported prevalence rates of youth problem gambling is troubling from a scientific standpoint. The reported variability amongst studies of adolescents is considerably higher compared to the variability reported for adult prevalence rates of problem gambling. Whereas one can expect age, gender and regional differences in youth problem gambling, the observed wide range cannot be explained merely on the basis of these variables. The sources of such variability may be adding to the confusion as to the accuracy of the prevalence rates. Such differences in prevalence rates may be affected by a number of situational and measurement variables including varying sampling procedures (e.g., telephone surveys vs. school-based screens, community vs. convenience samples), use of different instruments and measures, varying cut-point scores associated with instruments, the use of modified instruments, the lack of consistency in terms of availability and accessibility of gambling venues, gender distributions, the age of the target population, cultural differences, as well as the possibility that adolescent reports are simply more variable than their adult counterparts (for a more thorough explanation see the reviews by Derevensky & Gupta, 2000a, 2000b; Stinchfield, *in press*; Volberg, 2001; and Winters, 2001).

The intent of this paper is not to enter into a detailed analysis of how youth gambling prevalence studies vary with respect to the aforementioned methodology source of inter-study variance. However, it is important to emphasize that to the extent that youth gambling studies have varied with respect to these various methodological factors, inter-study variability in estimates of problem gambling are likely to occur. We now turn more directly to the debate about inflated rates of youth problem gambling.

## **PUBLIC HEALTH IMPLICATIONS OF THE DEBATE**

### *Nomenclature Issues*

The fact that multiple terminologies have been used to identify individuals who have serious gambling and gambling-related problems (e.g., pathological gamblers, probable pathological gamblers, compulsive gamblers, problem gamblers, Level III, disordered gamblers) serves to fuel confusion in this area (Abbott & Volberg, 1999; NRC, 1999; Shaffer & Hall, 1996; Volberg, 2001). Recent efforts have called for the standardization of terminology, definitions and nomenclature (Cunningham-Williams, 2000; Report of the Second International Think Tank on Youth Gambling Issues, co-sponsored by McGill University and Harvard Medical School, 2001; Shaffer & Hall, 1996, 2001; Shaffer, Hall & Vander Bilt, 1997). While the DSM-IV criteria characterizes pathological gambling in relatively precise terms (NRC, 1999), its use as a measurement instrument, especially for youth, has been somewhat controversial.

The intent of this paper is not to enter into the discussion concerning the issues of nomenclature or terminology with respect to youth gambling problems. Nevertheless, it is important to acknowledge that multiple terminologies have been used to delineate adolescents who have serious gambling and gambling-related problems. The fact remains that independent of nomenclature issues, all youth classified as having severe gambling problems have met the established criteria on one or more of the existing screens and measurement instruments (Derevensky & Gupta, 2000a).

### *Overestimation of Adolescence Prevalence Rates*

The assumption that adolescent gambling problems are significantly inflated has serious social policy and public health policy implications. If one assumes that reported prevalence rates of youth with gambling problems are significantly over-inflated, some researchers and policy makers have argued that the development of prevention and treatment programs may be only marginally necessary. Similarly, following this argument, some might conclude that there would be little need for media sensitization, youth and parental awareness campaigns, and still further that funding allocations and research should

be shifted toward the 'more severe consequences' associated with adult pathological gambling or other adolescent addictive or high-risk behaviors. This perspective, while advocated by some, is in stark contradiction to the numerous international and provincial agencies that are currently promoting further research on youth gambling (i.e., National Center for Responsible Gaming (U.S.), National Institute of Health (U.S.), National Institute of Mental Health (U.S.), SAMHSA (U.S.), Ontario Problem Gambling Research Centre, Alberta Gambling Research Centre, the Ontario Ministry of Health and Long-Term Care, and the Quebec Ministry of Health and Social Service).

*Arguments Advanced to Support the Inflated Rate Viewpoint*

We have identified five primary arguments that have been advanced to support the inflated rate perspective: (a) if the prevalence of adolescents with gambling problems is as high as reported, more adolescents would present themselves for treatment, (b) youth misunderstand and fail to adequately comprehend many of the questions in problem gambling screens, concomitant with a preset bias toward false-positive responses, (c) the discrepancy between prevalence rates of pathological gambling for adults and youth is illogical given the greater availability of high-stakes gambling readily available for adults, (d) there are common scoring errors in certain instruments, in particular the DSM-IV-J which have resulted in overestimates, and (e) current screening instruments for youth lack sufficient construct validity. We will address the strengths and weaknesses of each of these suppositions.

*The Incidence of Youth Seeking Treatment Is Inconsistent with Reported Prevalence Rates*

An underlying premise to the argument that problem gambling among youth is overestimated is predicated upon the belief that that if there were large numbers of adolescents with significant gambling problems, more youth would be presenting themselves for treatment. This argument also assumes that despite lower prevalence rates a larger percentage of adults seek treatment for problem gambling. Although few rigorous studies have been conducted, there is a general consensus among clinicians that a greater number of adults are treated in clinic

settings for problem gambling (Gupta & Derevensky, 2000). Although one explanation for this phenomenon is that the rate of adolescent problem gambling is very low, the process by which any individual seeks professional help is complex, affected by multiple individual and health service delivery factors.

Reasons cited for the failure of youth with serious gambling problems to seek treatment include (a) adolescents have a perceived sense of invulnerability and invincibility, (b) in the absence of major financial problems adolescents either believe they do not have a problem or firmly believe that they have the ability to stop gambling whenever they want, (c) few treatment centers for gambling problems exist that are readily available and easily accessible, (d) adolescents have a distrust for treatment providers in general and as such prefer to seek social support from peers or significant others, (e) clinicians fail to ask questions about gambling behaviors when youth are seen in clinic settings (many adolescents may have co-morbid disorders and seek treatment for other addictive or mental health problems), (f) some, or many, youth may experience natural recovery, (g) youth are often not brought through the court system which might mandate treatment as they are often bailed out of financial trouble by friends and family members, (h) the negative consequences for an adolescent with gambling problems may not be readily recognized as unique to gambling but rather attributed to other problems or normal adolescent risk-taking tendencies, (i) fear of the negative perceptions and stigma associated with therapy, (j) denial that they have a gambling problem despite scoring high on gambling severity screens, and (k) adolescence is a developmental period marked by high-risk taking behaviors with few seeking professional help (Griffiths, 2001; Gupta & Derevensky, 2000; Hardoon & Derevensky & Gupta, 2002; Hardoon, Derevensky & Gupta, in press; Hodgins, Makarachuk, el-Guebaly & Peden, in press; Jessor, 1998; Stinchfield, 1999).

This should not be misinterpreted that we are suggesting that adolescent problem gambling is unique as an under-referred behavioral problem. There is a substantial body of literature indicating that adolescents similarly don't readily seek treatment for other behavioral problems, including alcohol and drug abuse and dependence, despite their appreciable rates (Johnston, O'Malley & Bachman, 2001; SAMSHA, 2001). It is equally important to place the present argument within the context of adult problem gambling. Many of the potential barriers to

seeking treatment are also relevant to adults, and yet adult pathological gamblers appear to be more prone to seek treatment (NRC, 1999). Nevertheless, it is plausible to argue that factors in the complex health service delivery matrix that affect the process of receiving treatment for a behavioral or psychiatric condition may be quite unique to youth. For example, adolescents usually have fewer external sources (e.g., courts, a spouse or employer) that require or strongly encourage them to seek treatment; travel to a treatment program is more difficult for youth compared to an adult, especially in less urban communities; and adolescents generally have less self-insight resulting from their egocentricity and developmental immaturity. As such, it is plausible that youth problem gamblers may have to overcome significantly more service delivery barriers compared to adult problem gamblers.

*Youth Fail to Understand the Questions Being Asked in Gambling Screens and Have a Preset Bias Toward Positive Responses*

Ladouceur et al. (2000) in their article, "*Is the SOGS an accurate measure of pathological gambling among children, adolescents, and adults,*" contend that the SOGS, and in particular the SOGS-RA, overestimates the prevalence rates of pathological gambling since youth often fail to understand the meaning of the questions asked within gambling screens. Using the SOGS-RA, Ladouceur and his colleagues contend that the true prevalence rate of adolescent pathological gambling is less than 3%, a figure which is amongst the lowest of reported prevalence rates (see Jacobs, 2000; NRC, 1999, although Volberg, 2002 in a recent study in Nevada using a telephone methodological procedure reported prevalence rates of problem gambling amongst youth to be 2.2%). Their contention is predicated upon the reported limitations of the screening instruments for adolescents and is based upon two separate youth studies as well as a sample of adults.

Using two samples of children, participants were provided the definition that "gambling was an activity that involves an element of risk or chance whereby money or a valuable object is either won or lost" (p. 8). Participants were subsequently administered the SOGS-RA, followed by an individually conducted item clarification interview after which the screen was re-administered. The first study, similar to a previously reported prevalence study using 1651 grade school children (Ladouceur, Ferland, Jacques & Boudreault, 1997), used the SOGS-RA



as a gambling screen for children age 9–12 (grades 4, 5, & 6). For younger students (grade 4) items were read aloud by a research assistant while for older students a research assistant was available to answer any questions. Ladouceur et al. (2000) reported that on average 27% of the SOGS-RA items were misunderstood by the children and that after the clarification procedure fewer children (73% reduction) met the criteria for problem pathological gambling at re-testing compared to the baseline rate. Their conclusions, while provocative, are not surprising given the fact that the SOGS-RA was not intended to be used for this age group and its use in such a sample was developmentally inappropriate. While there is consensus and clear evidence that children as young as age 9 are gambling for money (Derevensky, Gupta, & Della-Cioppa, 1996), from a clinical perspective it is difficult to conceptualize children this young as having pathological gambling problems given that the concomitant multiple behaviors associated with gambling problems are atypical of such young children.

Study 2, using high school students, is clearly the more important study with respect to youth since this is in fact the age for which the SOGS-RA was intended. Ladouceur and his colleagues reported “a significant decrease on the SOGS-RA total score between the first ( $M = 2.14$ ;  $SD = 2.32$ ) and second administration ( $M = 1.51$ ;  $SD = 2.29$ )” [after clarification of items] (p. 14). This finding actually represents a decrease of .63 items (less than one item). While this *may* have decreased the overall scores by 29% (no data is presented to support this claim) and possibly reaches statistical significance, this is in fact a clinically non-significant finding given the small overall change. As well, nowhere in this paper do the authors acknowledge translating the SOGS-RA into French (an assumption given the data was collected in and around Quebec City), the methodology by which this was accomplished, nor do they acknowledge the possibility that discrepant findings may be accounted for by translation and/or linguistic discrepancies, or more broadly to important cultural differences. When translating any instrument into another language, it is important to verify that the target population being studied understands the questions *prior* to its use. Unless this study was conducted in English (no mention of language or number of schools used are provided), the results are subject to interpretation. In fact, Ladouceur et al. concluded that there was little difference in accuracy rates between the adolescent sample (Study 2) and adult sample (Study 3). More

specifically, it is interesting to note that according to Ladouceur et al. (2000) in Study 3 using adults, “no participant understood all of the items.” The authors further suggest, “In view of the methodological issues indicated, the results of these three studies do not constitute watertight evidence that the SOGS [SOGS-RA] increases the prevalence of pathological gambling because of misinterpretation of items by some respondents” (p. 19).

Ladouceur and his colleagues point to “caution in uncritically accepting the SOGS [we’re assuming SOGS-RA]—based estimates of the prevalence of pathological gambling” (p. 19). We contend, as they reported, that this does not provide conclusive evidence for their arguments, that measurement errors likely exist and that inter-test variability is certainly evident (see Derevensky & Gupta, 2000a). Nevertheless, measurement errors may also err on the side of underestimating prevalence rates given that the results reported by Ladouceur and his colleagues used a convenience sample of high school students (Study 2) failing to account for school dropouts.

The acquiescence bias that Ladouceur et al. (2000) cite as a primary reason respondents initially over-endorsed certain SOGS-RA items is worth exploring from several perspectives. There is no obvious psychological *a priori* reason suggesting why respondents would be inclined to bias their initial responses in a positive direction when faced with an ambiguous item. However, although Ladouceur and his colleagues suggest that when uncertain of the exact meaning of a question, gamblers may be more motivated to exaggerate their gambling exploits. One could make an equally cogent argument that gamblers may wish to under-report their gambling involvement as there is ample evidence that gamblers in treatment report previous denial of the extent of their gambling, thereby underestimating the severity of the problem (Dickerson & Hinchey, 1988).

A more recent study by Thompson, Walker, Milton and Djukic (2001), using adults in Australia, failed to replicate Ladouceur et al.’s (2000) results. Using both a clinical and non-clinical sample, in two separate studies, they suggested that clarification of SOGS items had no overall effect on the magnitude of both the clinical and non-clinical gamblers’ SOGS scores. This was found for conditions that incorporated both verbal and written clarifications. Interestingly, while the effect of written clarification produced negligible effects, verbal clarification of items (as similarly used in the Ladouceur et al. study) re-

sulted in mean SOGS scores that were substantially higher than when no clarification was provided. The results with respect to verbal clarifications were replicated in a second, more tightly controlled experiment with again significant increases (as opposed to decreases in the Ladouceur et al. study) in SOGS post-explanation scores. Thompson et al. (2001) concluded that while there is some evidence that pathological gamblers are less likely than their non-clinical peers to over-endorse items, the gambling community remains in great need of an instrument which accurately distinguishes between problem and non-pathological gamblers. While Thompson et al.'s (2001) studies used the SOGS and included clinical and non-clinical adults, it certainly raises the possibility that differences amongst youth may be similarly found. Only further replication studies can adequately address this issue.

Binson and Catania (1998) reported that misunderstanding of items on a non-gambling survey can result in under-reporting of personal behaviors even in an anonymous telephone survey. This may have accounted for Volberg's (2002) report of low prevalence rates of youth problem gamblers in Nevada. It is also relevant to consider that the screening process itself contributes to acquiescence bias. Screening tools, such as the SOGS-RA, are designed to be simple, quick and efficient. It is common for such instruments to contain straightforward questions and response options (e.g., yes/no) that admittedly fail to address the complexity of a psychological or psychiatric disorder that is presumed to underlie the screening measure (Connors, 1995). Screening measures in the behavioral sciences are not expected to measure the subtleties and complexities associated with a multi-dimensional behavioral disorder. In fact, in some settings, a desirable screening measure will err on the side of caution by way of encouraging item endorsements in order to avoid the mistake of a false-negative (Anastasi, 1976). Thus, if the SOGS-RA errs on the side of acquiescent responses, then it is performing in a manner consistent with its nature.

Other explanations for why participants changed responses at re-administration are noteworthy as well. Ladouceur and his colleagues acknowledge that changes in behavior may be a result of a number of contextual factors present at the time of testing. It is plausible that if students perceived that they were administered the identical gambling screen a second time, they may have interpreted that the experimenters were not pleased with their initial responses and, as such, subsequently changed their responses to non-endorsement. Thus, item en-

dorsements may have changed at post testing in the negative direction if respondents believed that their original responses were not acceptable. A negative second response may well occur if the adolescent (or adult) perceived that the clarification interview was eroding participant anonymity. The phenomenon of "re-testing shrinkage" is a familiar problem in psychiatric temporal stability studies (Robins, 1985) and in psychiatric follow-up studies (Eaton, Kramer, Anthony, Chee, & Shapiro, 1989). When participants are not provided with clear instructions as to why the identical test is re-administered, Robins (1985) has suggested that a downward bias can often occur.

The prevalence rates of youth pathological gamblers obtained by Ladouceur et al. (2000) are amongst the lowest continuously reported in the youth literature (Jacobs, 2000; NRC, 1999; Shaffer & Hall, 1996). While outlying results (both high and low prevalence rates) should be carefully examined, the failure to replicate these findings by Thompson et al. (2001) and the weakness of arguments as well as cultural and linguistic biases raise serious doubts as to the validity of their claim that adolescents and adults fail to comprehend the intent of the questions.

*Since Adult Prevalence Rates of Pathological Gambling Are Considerably Lower Than Youth Prevalence Rates, Youth Prevalence Rates Must Be Overestimated*

This argument is predicated upon the assumption that many youth engage in multiple risk-taking behaviors, yet most ultimately 'settle down' with maturity (see Jessor, 1998 for a comprehensive examination of adolescent risky behaviors). As such, elevated youth pathological gambling prevalence may be reflective of a transient state. Following this argument, adolescents with gambling problems are best viewed as experiencing natural recovery as they mature into adulthood. Unfortunately, there is a paucity of prospective studies of youth problem gamblers which are able to empirically judge the validity of this argument. Even the one study in the literature that comes close to prospectively addressing gambling behaviors among youth (Winters, Stinchfield & Anderson, 2001) contains too small a sample of problem gamblers in order to shed much light on this topic (also see the review by Rugle, Derevensky, Gupta, Winters & Stinchfield, 2001).

Second, this may in fact merely be a cohort effect as argued else-

where (Gupta & Derevensky, 2000). This is the first generation of youth that will spend their formative years, and likely their entire lives, in an environment where gambling is widely accepted (Azmier, 2000), endorsed, promoted, and often owned at least partially by the government (i.e., state lottery corporations in the U.S., and partial or complete ownership of VLTs, casinos, and internet sites in other countries). This extensive exposure may result in less “maturing-out” as would be expected with other adolescent high-risk behaviors. Inevitably, longitudinal research and prospective studies with adequate sample sizes will be needed to clarify whether or not prevalence rates of problem gambling change over time (Volberg, 2001).

*There Are Common Scoring Errors Made on Certain Instruments*

In disputing the vast majority of current prevalence rates of youth pathological gambling, Ladouceur (2001) has argued that the prevalence rates reported by a number of researchers using the DSM-IV-J are erroneously inflated due to scoring errors. In several studies incorporating large numbers of youth using the DSM-IV-J, probable pathological gamblers were identified as having scored positively on 4/12 items. While this scoring procedure has been widely used by a number of researchers in the field (studies by Derevensky, Gupta and Volberg), and the DSM-IV-J has 12 items, it was pointed out by Ladouceur (personal communication) and confirmed by Fisher (personal communication) that an adolescent was required to score 4/9 categories rather than 4/12 items on the DSM-IV-J in order to meet the criteria for probable pathological gambling. The interpretation of Fisher’s 1992 article by us and others was, in fact, inaccurate. That is, it was an error to use the 4/12 cut-point score for pathological gambling, rather the intention was to use the 4/9 category cut-point score. The establishment of 4/9 categories was done in order to both parallel the DSM-IV criteria for pathological gambling as well as to create a distinction between gambling-related delinquency and non-gambling-related delinquency among disruptive youth. As a result, the prevalence rates of all our previous research data sets scored in this manner (previously published data or those under review for publication), representing over 5,000 adolescents, were recalculated. These re-calculations yielded no meaningful, appreciable or statistically significant differences in prevalence rates. Prevalence findings using the DSM-IV-J also paralleled

those found using the SOGS-RA scoring criteria (Derevensky & Gupta, 2000a).

Examining endorsement rates for each item on the DSM-IV-J (see Derevensky & Gupta, 2000a; Gupta & Derevensky, 1998a) confirmed why the prevalence rates did not change. Item analyses revealed that endorsed items focused upon preoccupation, spending increasing amounts of money on gambling, becoming tense and/or restless when gambling, using gambling as a way of escaping problems, and chasing losses were the predominant responses of problem gamblers. It was only in one study (Marget, Gupta & Derevensky, 2000) that any difference in prevalence rates was found. In the Marget et al. study, the initially reported prevalence rates of youth experiencing significant gambling problems (using the 4/12 scoring criteria) was 6.9%, which was subsequently reduced to 6.5% (using the 4/9 scoring criteria), a marginal difference. This further reinforces the need for researchers to provide confidence intervals as well as prevalence rates. Fisher has suggested (personal communication) that problem gambling among youth is a robust finding. "If kids were scoring 4/12 items on the scale [it should also be noted that those individuals previously identified as probable/pathological gamblers usually score much higher], then common sense dictates that they have a problem of some degree." The items that lead to more positive cases on the screening instrument are behavioral indices and important indicators of problematic gambling related behaviors. It is important for researchers to report item endorsement rates independent of instrument used.

#### *The Current Instruments Lack Good Reliability and Construct Validity*

Clearly, nomenclature, reliability estimates and construct validity of youth problem gambling measures are significant and important issues. In fact, these are issues that a team of researchers is addressing as a result of a recommendation from the Second International Think Tank on Youth Gambling Issues. These screening instruments, while not perfect (see the review by Stinchfield, in press, for a list of the available instruments), represent our current state of knowledge and best estimates of pathological and problem gambling. Efforts to resolve issues surrounding nomenclature and initiatives to develop a more reliable and valid instrument for youth remain necessary. Nevertheless, the reliability and validity evidence for the measures most

often used by researchers in the field—SOGS-RA (Winters, Stinchfield, & Fulkerson, 1993) and the DSM-IV-MR-J (Fisher, 2000), are consistent with acceptable psychometric standards, with one important exception—the lack of adequate criterion validity.

It is fair to characterize existing adolescent gambling instruments as screening measures. As such, their ability to accurately classify individuals into problem severity groups is necessarily limited. And as noted earlier, this limitation is probably biased in a particular direction. That is, all other things being equal, the rate of youth problem gambling would probably be higher based on a screening measure compared to the rate obtained if the same population were assessed with a comprehensive, validated psychiatric instrument. The extent of the bias created with a screening measure can be estimated from proper criterion validity data. Criterion validity evidence is a vital psychometric test of any screening tool. Data from such an analysis speaks to the measure's accuracy, usually reported as rates of correct classification, false positive and false negative, in identifying the clinical or problem group for which it was designed. Ideally, a "gold standard" criterion measure in a criterion validity study is necessary. Nevertheless, when a gold standard is absent, as is often the case in the study of behavioral disorders, a "best estimate" procedure is commonly used. With this procedure, diagnostic (or criterion) decisions are finalized in case presentations on the basis of findings from either a well-established structured or semi-structured interview, or in the absence of such interviews, from a detailed clinical interview conducted by at least one diagnostic expert (Kosten & Rounsaville, 1992; Leckman et al., 1982). Because none of the youth problem gambling prevalence studies in the literature have been based on instruments that have undergone this standard of establishing criterion validity (Winters, 2001), and given the proclivity of screening tools to over-identify positive cases, the current body of prevalence data on this topic merits our psychometric suspicion.

Regardless of one's views on the possibility that measurement artifacts associated with screening tools bias the problem gambling prevalence rates in an upward direction, a cogent argument can be advanced that prevalence study design characteristics may bias the data in the opposite direction. In an early review of the literature, Lesieur (1994) suggested that epidemiological studies of problem and pathological gamblers among adults were plagued with serious methodological limitations and biases including problems specific to survey

instruments, non-responses and refusal biases, the exclusion of institutionalized populations, exclusion of specific groups, and difficulties associated with telephone surveys. Lesieur's early warnings and concerns bear on the issue that prevalence studies may under-estimate the rate of problem gambling because the most antisocial and delinquent individuals are less likely to be surveyed. Clearly, similar methodological problems exist in the youth gambling literature as well. The two predominant methodological assessment procedures (i.e., telephone interviews and school-based surveys) for collecting survey data may be omitting an important segment of the youth population such as delinquents, school dropouts, absent students and those failing to participate in such studies. Recently, Chevalier, Allard and Audet (2001) noted that youth in Quebec who are repeatedly absent from school are similar to school dropouts and concluded that prevalence rates of youth gambling problems are very likely underestimated. Westphal and Johnson (1999) reported high rates of pathological gambling among incarcerated youth (20%) in detention centers throughout Louisiana. Similar results were found in a study of incarcerated adolescents in a youth detention center in Montreal (Derevensky & Gupta, 1998).

To the extent that excluding delinquent youth biases surveys, current prevalence rates may in fact be rather conservative estimates (e.g., Jacobs, 2000). A cautionary note is required given that adolescents in general have considerably higher comorbid psychiatric illnesses, which ultimately raises more complex questions about the nature of gambling problems. Still further, a number of issues including the individual's social environment (e.g., economic conditions, survey-taking climate, survey methodology, environmental characteristics) and household or individual differences (e.g., household structure, parental influence, socio-demographic characteristics, psychological predisposition) need to be addressed (Groves & Couper, 1998; Groves, Dillman, Eltinge, & Little, 2002).

### CONCLUDING REMARKS

There remains little doubt that problem gambling among adolescents and adults remains a social problem, a public health concern, and a research area of growing importance (Korn & Shaffer, 1999;



Wynne, 1998). We have explored several arguments suggesting that reported rates of youth problem gambling are inflated. We are concerned that methodologically limited arguments have been advanced to dismiss the vast amount of research in this area. We contend that youth problem gambling is a serious problem for a small, but identifiable, minority of youth, and that it represents a significant public health policy issue.

The issue of prevalence rates, while important, should not be our primary focus of research. There is no doubt that screening instruments need to be refined and that psychometrically sound, and comprehensive instruments must be developed in order to approach a "gold standard" for defining youth problem gambling. We also acknowledge that it is undesirable to have multiple terminologies used to identify adolescents who have serious gambling and gambling-related problems (e.g., pathological gamblers, probable pathological gamblers, compulsive gamblers, problem gamblers, Level III, disordered gamblers). However, there remains a clear consensus amongst gambling researchers, clinicians, and educators that there is a need for continued awareness regarding this potential health risk behavior among youth and continued attention toward developing relevant and effective prevention and treatment programs. As well, additional research designed to identify the underlying risk and protective factors that can help prevent youth gambling and mental health problems is needed. In several recent papers we argued for a better understanding of youth gambling problems within the context of adolescent high-risk behaviors (e.g., Derevensky, Gupta, Dickson & Deguire, 2001; Dickson, Derevensky & Gupta, 2002). We have attempted to articulate the similarities between youth pathological gambling and other addictive behaviors and have suggested the need for more general prevention programs building upon the development of coping and adaptive skills.

Dialogue and discrepancies often result in positive scientific advancements. Clearly, discrepancies in research results can stem from a multitude of parameters be they theoretical, conceptual, methodological, structural, cultural, linguistic, economic or otherwise. We suspect that discrepancies in prevalence rates reported by Ladouceur et al. (2000) *might* be a result of some cultural and linguistic factors and are not a reflection of serious gambling problems amongst youth being over represented in the literature. The complete disclosure of all pa-

rameters is essential for constructive dialogue to take place. While there is a clear danger in becoming an alarmist and over exaggerating the prevalence rate of youth gambling problems, there is an equal danger in minimizing these problems. If, as considerable research suggests, gambling venues continue to increase and accessibility by under-age youth is widespread, there remains little doubt that youth will continue to engage in these behaviors quite early. Given that a substantial amount of time is necessary between initial onset of gambling behavior and pathological gambling to occur, it is conceivable that the issue of youth problem gambling will continue to present even more serious concerns over time.

While refinement of instrumentation, measurement (the development of some agreed upon gold standard) and nomenclature issues need resolving, the reported rates of problem gambling among youth are quite provocative and signal a serious public health concern. Even if prevalence rates are inflated, there is ample evidence that gambling related problems amongst youth result in numerous, and long lasting, psychological, social, economic, health, and interpersonal difficulties. As well, studies of adults have suggested that it can take between 8–12 years from the initial onset of gambling for gambling behaviors to mature and escalate to levels of pathological gambling (Australian Productivity Commission, 1999; Tavares, Zilberman, Beites & Gentil, 2001). If young adults are also at high-risk for pathological gambling, there is ample evidence that these problematic behaviors began during adolescence (the Australian Productivity Commission (1999) reported that 28% of gamblers in counseling indicated they initiated gambling *regularly* below the age of 18 years) and as such prevention strategies need to be initiated early. In this vein, further research on prevalence, prevention and treatment efforts must be directed toward advancing science and protecting the health of youth.

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