

CHAPTER 2. THE PREVALENCE AND CORRELATES OF GAMBLING PROBLEMS AMONG ADULTS

Legal gambling is now an accepted part of the social landscape in many countries. When gambling is legalized, the operation and oversight of these activities become part of the routine processes of government. Gambling commissions are established; revenues are distributed; and constituencies of customers, workers and organizations develop. Governments become dependent on revenues from legal gambling to fund essential services. Many nongambling occupations and businesses also become dependent on revenues from legal gambling to continue to operate profitably, including convenience stores, retail operators, restaurants, hotels, social clubs, and charitable organizations. Ancillary services—including legal, accounting, architectural, public relations and advertising, security, and financial organizations—expand their activities to provide for the needs of gambling operations (Volberg 1998a).

A further element in the growing legitimacy of gambling has been the “medicalization” of gambling problems and the professionalization of gambling treatment (Abt & McGurrin 1991; Rosecrance 1985), in other words, the acceptance of gambling problems as suitable subjects for disciplines such as psychiatry, clinical psychology, and epidemiology. A constituency of well-educated treatment professionals has emerged whose livelihoods involve providing services to governments and gaming operators. Organizations that provide services to these helping professions—hospitals, clinics, government health agencies, universities and colleges, the insurance industry—have growing interests in the development of legal gambling. These organizations are investing increasing, though still relatively modest, resources in training and certifying treatment professionals, in educating students, and in covering treatment for pathological gambling.

The Social Construction of Psychiatric Tools

The tools used to generate numbers are always a reflection of the work that researchers and others are doing to identify and describe the phenomena in which they are interested (Gerson 1983). Historically, standardized measures and indices have often emerged in situations where there is, simultaneously, intense controversy and a perceived need for public action (Porter 1995). Examples include the emergence of measures of “public utility” in France in the mid-1800s and the development of cost-benefit analysis in the United States in the mid-1900s.

There have been three “generations” of psychiatric research since the turn of the century. The third, and latest, generation of studies began around 1980 and coincided, as did the first two generations, with dramatic changes in psychiatric nomenclature (Dohrenwend 1998). The publication of the third edition of the *Diagnostic and Statistical Manual (DSM-III)* (American Psychiatric Association 1980), with its systematic approach to psychiatric diagnoses, led directly to the development of semi-structured interviews and rating examinations for use by clinicians. These tools were quickly adopted for epidemiological research despite the lag in research to establish the validity of these case identification procedures among general population samples (Dohrenwend 1995).

The assumption underlying all of the existing gambling research is that gambling-related difficulties are a robust phenomenon and that gambling problems exist in the community and can be measured. Despite agreement among researchers and treatment professionals at this fundamental level, there is disagreement about the concepts and measurement of gambling-related difficulties. The ascription of “conceptual and methodological chaos” to the field (Shaffer, Hall & Vander Bilt 1997:8) may be an overstatement of the situation among its experienced researchers, but the presence of competing concepts and methods is not uncommon among emerging and even mature scientific fields. Nevertheless, disputation among experts has led to some degree of public confusion and uncertainty about the impacts of legal gambling on society.

Measuring Gambling Problems

Following the inclusion of the diagnosis of pathological gambling in the *DSM-III* for the first time in 1980, a few researchers from a variety of scientific disciplines, including psychiatry, psychology, and sociology, began to investigate gambling-related difficulties using various methods from psychiatric epidemiology. At this time, few tools existed to measure gambling-related difficulties. The only tool that had been rigorously developed and tested for its performance was the South Oaks Gambling Screen (SOGS). The SOGS, closely based on the new diagnostic criteria, was originally developed to screen for gambling problems in clinical populations (Lesieur & Blume 1987).

The SOGS is a 20-item scale that includes weighted items to determine if the client is hiding evidence of gambling, spending more time or money gambling than intended, arguing with family members over gambling and borrowing money from a variety of sources to gamble or to pay gambling debts. In developing the SOGS, specific items as well as the entire screen were tested for reliability and validity with a variety of groups, including hospital workers, university students, prison inmates, and inpatients in alcohol and substance abuse treatment programs (Lesieur & Blume 1987).

Adopting the South Oaks Gambling Screen in population research

Like other tools in clinical research, the SOGS was quickly adopted in clinical settings as well as in epidemiological research. The SOGS was first used in a prevalence survey in New York State (Volberg & Steadman 1988). By 1998, the SOGS had been used in population-based research in more than 45 jurisdictions in the United States, Canada, Asia and Europe (Shaffer, Hall & Vander Bilt 1997; Volberg & Dickerson 1996; Volberg & Moore 1999). This widespread use of the SOGS came at least partly from the great advantage of comparability within and across jurisdictions that came with use of a standard tool (Walker & Dickerson 1996). Although there were increasingly well-focused grounds for concern about the performance of the SOGS in non-clinical environments, this tool remained the *de facto* standard in the field until the mid-1990s, when the new DSM-IV criteria were published (American Psychiatric Association 1994; Volberg & Banks 1990).

Like all tools to detect physical and psychological maladies, screening questions to detect gambling problems can be expected to generate some errors in classification. However, misclassification has very different consequences in different settings. Misclassification can occur when an individual without the malady in question is misdiagnosed as having the malady. This type of classification error is called a “false positive.” Misclassification

can also occur when an individual with the malady is misdiagnosed as not having the malady. This type of classification error is called a “false negative.” While most screens to detect psychiatric disorders work well in clinical settings where the prevalence of the disorder under investigation is predictably high, the accuracy of many psychiatric screens declines when they are used among populations where prevalence is much lower, such as the general population (Dohrenwend 1995).

Validating the South Oaks Gambling Screen

A national study in New Zealand in the early 1990s furnished an opportunity to examine the performance of the SOGS in the general population (Abbott & Volberg 1992, 1996). This opportunity arose from the two-phase research design employed in the New Zealand study, which allowed the researchers to identify *true pathological gamblers* using face-to-face interviews with respondents selected from subgroups of respondents in a much larger telephone survey. These sub-groups included non-problem gamblers, lifetime problem gamblers, and lifetime probable pathological gamblers, as classified by the SOGS. Prevalence rates for the national sample were corrected using the “efficiency approach,” which involved calculating the rate of true pathological gamblers in each group and dividing this number by the total number of respondents in the sample. The efficiency approach resulted in a revised current prevalence estimate in New Zealand that was 0.1 percent higher than the uncorrected current prevalence rate.

The revised prevalence estimate in New Zealand rested on the conservative assumption that there were no false negatives among individuals who do not gamble regularly. While error rates in the sub-groups have an impact on the overall prevalence rate, the size of the error rate for each group has a different impact because of the different sizes of these groups in the population. Even if the number of false negatives among respondents who do not gamble regularly were extremely small, the relatively large size of these groups contributes to a noticeably higher overall prevalence rate. For example, if the nongambling group in New Zealand is assumed to include a very small number of pathological gamblers (1 percent), the prevalence estimate increases by 0.7 percent.

The New Zealand researchers concluded that the *lifetime* SOGS was very good at detecting pathological gambling among those who would *currently* meet diagnosis for this disorder. However, as expected, the SOGS identified pathological gamblers at the expense of generating a substantial number of false positives. The *current* SOGS produced fewer false positives than the lifetime measure but more false negatives. It thus provided a weaker screen for identifying pathological gamblers in the clinical sense. However, the greater efficiency of the current South Oaks Gambling Screen made it a more useful tool for detecting rates of change in the prevalence of problem gambling over time (Abbott & Volberg 1996).

The eclipse of the South Oaks Gambling Screen

With the rapid expansion of legalized gambling in the early 1990s, state governments began to establish services for individuals with gambling problems. In establishing these services in more than 20 states, policy makers and program planners sought answers to questions about the number of “pathological gamblers” in the general population who might seek help for their difficulties. These questions required epidemiological research to identify the number (or “cases”) of pathological gamblers, to ascertain the demographic

characteristics of these individuals, and to determine the likelihood that they would utilize treatment services if these became available.

Around this same time, a variety of methodological questions were raised about SOGS-based research in the general population (Culleton 1989; Dickerson 1993; Lesieur 1994; Volberg 1994; Walker 1992). Some of these issues, such as respondent denial and rising refusal rates, were common to all survey research. Other questions were related to the issue of how best to study gambling-related difficulties. These included reservations about the reliability and validity of the SOGS, as well as challenges to assumptions about the nature of gambling problems that were built into the original version of this instrument.

What led to the growing dissatisfaction with the South Oaks Gambling Screen? One important change was the rapid expansion of legal gambling itself. This expansion led many people who had never before gambled to try these activities. As legal gambling expanded into new markets and as new types of gambling were marketed to new groups, the individuals seeking help for gambling difficulties became increasingly heterogeneous. In their efforts to discount what they saw as unreasonably high prevalence rate estimates, representatives of the gaming industries also played a role in the eclipse of the South Oaks Gambling Screen.

Prevalence surveys in the early 1990s suggested that growing numbers of women and middle-class individuals were developing gambling problems (Volberg 1992; Volberg & Silver 1993). Several of the specific items included in the SOGS made little sense to these new groups or to the treatment professionals working with them. Questions about borrowing from loansharks, for example, or cashing in stocks and bonds to get money to gamble or pay gambling debts were more relevant to the middle-aged, middle-class men most likely to seek help for gambling problems in the 1970s and early 1980s than to the young adults and middle-aged women who began to experience gambling problems in the 1990s. Questions about others criticizing one's gambling and feeling guilty about one's gambling were more likely to receive a positive response from low-income and minority respondents than others in the population (Volberg & Steadman 1992). Questions about borrowing from the "household" to get money to gamble would be interpreted differently by individuals from ethnic groups where "household" may be defined as the entire extended family.

The need was also growing for tools appropriate to different settings and purposes, including program evaluation. In 1985, only three states funded services for problem gamblers, but by 1996, 21 states funded such services (Cox, Lesieur, Rosenthal & Volberg 1997). Along with these resources came new demands for accountability and performance. These demands drew further attention to the deficiencies of the SOGS and increased dissatisfaction with its performance in general population studies.

Emergence of a new standard: The DSM-IV

A standard exists when a multiplicity of workers concerned with a phenomenon accept, at least tacitly, that there is a best available measure to identify that phenomenon, and then adopt that measure in their daily work (Becker 1960; Dean 1979; Gerson 1983; Volberg 1983). However, the way we look at problem gambling has changed over the past couple decades, and likewise, the DSM-IV criteria are very different from the diagnostic criteria adopted in the DSM-III in 1980 (American Psychiatric Association 1994).

The changes made to the psychiatric criteria for pathological gambling incorporated empirical research that linked pathological gambling to other addictive disorders like alcohol and drug dependence (American Psychiatric Association 1994). In developing the DSM–IV criteria, 222 self-identified pathological gamblers and 104 substance abusers who gambled socially tested the individual items (Lesieur & Rosenthal 1991). Discriminant analysis was used to identify the items that best differentiated between pathological and non-pathological gamblers. While the results from this sample indicated that a cutoff of 4 points was appropriate (Lesieur & Rosenthal 1998), the American Psychiatric Association established a diagnostic cutoff of 5 points. Pathological gambling is now defined as persistent and recurrent maladaptive gambling behavior as indicated by five or more criteria (listed in the table below), with the reservation that the behavior is not better accounted for by manic episodes—a reservation added somewhat as an afterthought, as it was not part of the underlying research on which the DSM–IV criteria were based.

Table 1. DSM–IV Criteria for Pathological Gambling

Preoccupation	Is preoccupied with gambling (e.g., preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)
Tolerance	Needs to gamble with increasing amounts of money in order to achieve the desired excitement
Withdrawal	Is restless or irritable when attempting to cut down or stop gambling
Escape	Gambles as a way of escaping from problems or relieving dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, or depression)
Chasing	After losing money gambling, often returns another day in order to get even (“chasing one’s losses”)
Lying	Lies to family members, therapists, or others to conceal the extent of involvement with gambling
Loss of control	Has made repeated unsuccessful efforts to control, cut back, or stop gambling
Illegal acts	Has committed illegal acts (e.g., forgery, fraud, theft, or embezzlement) in order to finance gambling
Risked significant relationship	Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling
Bailout	Has relied on others to provide money to relieve a desperate financial situation caused by gambling

Most researchers and treatment professionals working with gambling problems have expressed satisfaction with the new DSM–IV criteria. At two recent international meetings of gambling researchers and treatment professionals,¹ the consensus was that the field needed to move fully into the new “DSM–IV era.” Internationally, researchers and treatment professionals have adopted the DSM–IV criteria as the new standard. For

¹ The first meeting took place in conjunction with the Twelfth National Conference on Problem Gambling in June 1998 in Las Vegas, hosted by Trimeridian, Inc. Invited participants included researchers and treatment professionals from Australia, Canada, Great Britain, Spain, and the United States. The second meeting took place in September 1998 in Malta at the 42nd ICAA International Institute on the Prevention and Treatment of Dependencies; this meeting included members of the newly-organized ICAA Gambling Section from the countries of Canada, Denmark, Great Britain, Italy, the Netherlands, Spain, Sweden, and the United States.

all we have yet to learn about pathological gambling, the DSM–IV criteria are now the measure against which the performance of other instruments must be demonstrated.

At the end of the 1990s, one finds a rapidly growing community of researchers and treatment professionals active in the gambling field and a growing number of tools to measure gambling problems for different purposes. Until 1990, only three screens existed to identify individuals with gambling problems, including the ISR screen used in the last national study; the CCSM; and the SOGS (Culleton 1989; Kallick et al. 1975; Lesieur & Blume 1987). Since 1990, in contrast, nine screens for adults and three screens for adolescents have been developed, including two based on the SOGS and at least four based on the DSM–IV criteria.

Despite this proliferation, the psychometric properties of these new tools remain unexamined. Even more significantly, few of these new screens have been tested for their differential performance in clinical settings, population research, and program evaluation. Another concern is how to calibrate the performance of these new screens with the results of more than a decade of SOGS-based research.

Development of the NORC DSM–IV Screen for Gambling Problems (“the NODS”)

The guidelines put forth by the National Gambling Impact Study Commission specified that the DSM–IV criteria be used to identify problem and pathological gamblers in the general population. This meant that the SOGS could not be used, since this instrument is based on the outdated DSM–III criteria. In developing the questionnaire for the research to be conducted for the Commission, the NORC team identified three screens based on the DSM–IV criteria that had been used in population research. These included the Fisher DSM–IV Screen (Fisher 1996), the Diagnostic Interview Schedule (DIS; Cunningham-Williams et al. 1998), and the Diagnostic Interview for Gambling Severity (DIGS; Winters, Specker & Stinchfield 1997).²

Careful consideration was given to all three of these possible tools for identifying individuals with gambling-related difficulties. Our initial decision was to use the DIGS rather than the Fisher DSM–IV Screen or the DIS. This decision was based on the fact that only the DIGS had been tested for its performance with non-clinical groups (Stinchfield 1997). This decision was further based on the high internal consistency of this screen (Winters, Specker & Stinchfield 1997). However, examination of the individual items that make up the DIGS raised several doubts, especially about the varying timeframes associated with different items and about the forced splitting of some of the DSM–IV criteria into two items.

Accordingly, the research team elected to develop a new instrument based on the DSM–IV criteria. We have called the new instrument the NODS (NORC DSM Screen for Gambling Problems). The specific items that make up the NODS and the DSM–IV criteria to which they relate are shown in Table 2 below.

² A fourth screen based on the DSM-IV criteria, the Massachusetts Gambling Screen (MAGS; Shaffer, LaBrie, Scanlan & Cummings 1994) has never been used in adult population research.

Table 2. DSM–IV Criteria and Matched NODS Lifetime Questions

Preoccupation	1	Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about your gambling experiences or planning out future gambling ventures or bets? OR
	2	Have there ever been periods lasting 2 weeks or longer when you spent a lot of time thinking about ways of getting money to gamble with?
Tolerance	3	Have there ever been periods when you needed to gamble with increasing amounts of money or with larger bets than before in order to get the same feeling of excitement?
Withdrawal	4	Have you ever tried to stop, cut down, or control your gambling?
	5	On one or more of the times when you tried to stop, cut down, or control your gambling, were you restless or irritable?
Loss of control	6	Have you ever tried but not succeeded in stopping, cutting down, or controlling your gambling?
	7	If so, has this happened three or more times?
Escape	8	Have you ever gambled as a way to escape from personal problems? OR
	9	Have you ever gambled to relieve uncomfortable feelings such as guilt, anxiety, helplessness, or depression?
Chasing	10	Has there ever been a period when, if you lost money gambling one day, you would return another day to get even?
Lying	11	Have you ever lied to family members, friends, or others about how much you gamble or how much money you lost on gambling?
	12	If so, has this happened three or more times?
Illegal acts	13	Have you ever written a bad check or taken money that didn't belong to you from family members or anyone else in order to pay for your gambling?
Risky significant relationship	14	Has your gambling ever caused serious or repeated problems in your relationships with any of your family members or friends? OR
	15	ASK ONLY IF R IS IN SCHOOL Has your gambling caused you any problems in school, such as missing classes or days of school or your grades dropping? OR
	16	Has your gambling ever caused you to lose a job, have trouble with your job, or miss out on an important job or career opportunity?
Bailout	17	Have you ever needed to ask family members or anyone else to loan you money or otherwise bail you out of a desperate money situation that was largely caused by your gambling?

The NODS is composed of 17 lifetime items and 17 corresponding past-year items, compared to the 20 lifetime items and 20 past-year items that make up the SOGS, and the 20 items (19 items in the field test) that make up the DIGS. Like the revised South Oaks Gambling Screen (SOGS–R) used in most of the epidemiological research on gambling since 1991, the past-year item is asked for each lifetime NODS item that receives a positive response. The maximum score on the NODS is 10, compared to 20 for the SOGS. Although there are fewer items in the NODS, and the maximum score is lower, the NODS is designed to be more demanding and restrictive in assessing problematic behaviors than the SOGS or other screens based on the DSM–IV criteria.

Several complications needed to be overcome in developing the NODS. For example, a number of the DSM–IV criteria are difficult to establish with a single question. In assessing these criteria (preoccupation, escape, and risking a significant relationship), we used two or three questions, and respondents received a single point if they gave a positive response to any of the questions assessing that criterion. Another complication in constructing the NODS is that two of the DSM–IV criteria (withdrawal and loss of control) assume that the questioner already knows that the individual has tried to “stop, cut down, or control” her or his gambling. Therefore, we obtained this information first before asking whether the respondent had felt restless or irritable during these times (i.e., withdrawal); we then assessed whether the respondent had succeeded in doing so (or, experienced loss of control).

Our final decision in developing the NODS was to place definite limits on several of the criteria, in keeping with the approach taken in alcohol and drug abuse research. For example, in assessing “preoccupation,” the NODS asks if the periods when respondents spent a lot of time thinking about gambling or about getting money to gamble have lasted 2 weeks or longer. Similarly, the NODS asks whether respondents have tried to control their gambling three or more times without success (loss of control). We also ask respondents if they have lied to others about their gambling three or more times (lying). Only a positive response to the latter questions contributes to the respondent’s score on the NODS.

The greater specificity of the NODS was adopted by the research team in response to concerns about misclassification. As noted above, research on the performance of the SOGS has shown that the *lifetime* screen is very good at detecting pathological gambling among those who *currently* experience the disorder. However, the lifetime SOGS accurately identifies at-risk individuals at the expense of generating higher numbers of false positives. Although more research is needed, it is likely that the lifetime NODS will prove more effective than the lifetime SOGS at detecting pathological gambling in a variety of populations.

In the national survey, NORC chose to administer the NODS only to those respondents who acknowledged ever losing \$100 or more in a single day of gambling, as well as to those respondents who denied this, but acknowledged that they had been behind at least \$100 across an entire year of gambling at some point in their lives. We chose to use these “filter” questions in the national survey after our pretesting indicated that nongamblers and very infrequent gamblers grew impatient with repeated questions about gambling-related problems. Moreover, our review of previous surveys indicated that persons who had never experienced significant losses were not those who reported problems related to gambling (Volberg 1997a, 1997b). We believe that this approach captured virtually all of the respondents within the survey’s respondent population who would report three or more problems.³ Further analyses will be needed to estimate the capture percentage for gamblers who would have reported one or two problems.

³ A bias may exist toward under-registration of problem gambling among lottery and bingo players. Such players tend to lose smaller amounts on any given day of gambling, which may accumulate to substantial sums; however, such players may not consider themselves “behind” in the sense that most gamblers would. Filtering based on expenditures or frequency of play rather than losses is an alternative approach that may yield some differences in survey-based estimation.

Validity and reliability of the NODS

In developing our instrument for identifying individuals with gambling-related difficulties, we received substantial assistance from the gambling treatment community. Most significantly, we were able to field-test the NODS and examine its performance in a clinical sample prior to adopting it in the national survey.

A sample of 40 individuals in outpatient problem gambling treatment programs throughout the United States responded by telephone to an abbreviated version of the questionnaire used in the national survey. Thirty-eight of these individuals (95 percent) scored five or more points on the lifetime NODS. A diagnosis of pathological gambling requires an individual to meet five or more of the DSM–IV criteria. The other two cases scored four points on the lifetime NODS. Lesieur and Rosenthal (1991, 1998) have argued persuasively that meeting 4 of the 10 DSM–IV criteria constitutes an appropriate threshold for a diagnosis of pathological gambling.

Scores for the past-year NODS were somewhat lower than lifetime scores in the clinical sample. Thirty of the forty individuals (75 percent) scored five or more points on the past-year NODS; five of these individuals (12 percent) scored three or four points; and the remaining five (12 percent) scored zero to two points. The significance of lower scores on the past-year than the lifetime scale may differ depending on the status of the client. As discussed below, the DSM–IV criteria are meant to accumulate or apply across as many years as the individual has gambled—five criteria are not required to appear within the confines of a single year in order to establish the diagnosis, firmly identifying the individual as a pathological gambler. Lower past-year scores may also result when an individual has been in treatment for an extended period (more than 1 year) or entered treatment in order to prevent an impending relapse.

The test-retest reliability of the NODS across a period of 2 to 4 weeks was tested in 44 cases, including some of the clinical cases discussed above. Both the lifetime and past-year scores on the NODS were highly reliable. The lifetime test statistic ($r=0.99$) and the past-year test statistic ($r=0.98$) were well above the 0.80 considered desirable for overall test–retest agreement. Our conclusion based on the field test was that the NODS has strong internal consistency and retest reliability. The lifetime NODS appears to have strong validity as well in identifying clinically confirmed pathological gamblers. In this respect, the past-year NODS does not perform quite as well. We report the past-year data here to permit comparison with results of other surveys which use the 12-month time frame, but we consider the lifetime NODS scores to be the superior instrument for the purpose of estimating prevalence rates and investigating correlates. We report the past-year data here to permit comparison with results of other surveys which use the 12-month time frame, but we consider the lifetime NODS scores to be the superior instrument for the purpose of estimating prevalence rates and investigating correlates.

The NODS typology

Numerous terms have been adopted or proposed in the field of gambling research to identify individuals who experience difficulties related to their gambling. The terms “compulsive” and “addicted” are popular with the public and the media; however, the psychiatric term “pathological gambler” is more widely used in the gambling treatment and research communities. The terms “problem,” “at risk,” “potential pathological,” “sub-clinical,” and “in transition” have all been proposed by gambling researchers or

treatment professionals to identify individuals who do not meet the psychiatric criteria for a gambling disorder but who nevertheless appear to experience substantial difficulties related to their gambling. One recent term, “disordered” gambling, was proposed as a way to describe the continuum of problems from less to more severe levels, noting the similarities and differences among troubled gamblers as observed in a multiplicity of studies (Shaffer, Hall & Vander Bilt 1997).

In discussing the results of the national survey, we have adopted the following terminology to correspond to the problem levels determined by the survey questions:

Table 3. Criteria for Classifying Respondents

Nongambler	Never gambled
Low-risk gambler	Gambled, but never lost more than \$100 in a single day or year OR Lost more than \$100 in a single day or year but reported no DSM-IV criteria
<i>Lost more than \$100 in a single day or year AND reported:</i>	
At-risk gambler	One or two DSM-IV criteria
Problem gambler	Three or four DSM-IV criteria
Pathological gambler	Five or more DSM-IV criteria

The role of timeframe

The DSM-IV describes pathological gambling in the following terms:

Pathological gambling is persistent and recurrent maladaptive gambling behavior...that disrupts personal, family, or vocational pursuits.... Although a few individuals are “hooked” with their very first bet, for most the course is more insidious. There may be years of social gambling followed by an abrupt onset.... The gambling pattern must be regular or episodic, and the course of the disorder is typically chronic. (APA 1994, pp. 615–17)

In the study of clinical disorders, pathological gambling is considered a chronic rather than an acute disorder. Acute disorders, like influenza, wounds, or broken bones, may be healed and leave no further mark or susceptibility. Chronic disorders, like pathological gambling, alcoholism, and manic depression, are quite different. Once fully developed, chronic disorders strongly tend to recur, constituting a lifelong vulnerability; even in periods of remission or relative quiescence, the disorder may yield a continuing stream of disabilities. This vulnerability to relapse may be effectively treated and kept in check. However, a period in which the individual is relatively free of symptoms does not indicate that the person is free of the disorder.

From the perspective of measuring prevalence, the strongest emphasis belongs on determining whether pathological gambling has developed, rather than on whether symptoms are recent or current. The DSM-IV criteria clearly reflect this, in their focus on the accumulation of discrete symptoms across a lifetime. These criteria do not require that specific symptoms be clustered tightly together in time (e.g., during the past year).

The field test conducted prior to the national survey demonstrated that the sensitivity of the lifetime NODS in a clinical population was higher than the past year NODS. One would expect this if pathological gambling were appropriately conceptualized as a

chronic disorder. It remains to be seen how well the past-year NODS criteria map onto clinical assessments of pathological gambling. Based on how the NODS is constructed, as well as our findings in the general population, we believe that the specificity of the NODS items is very good, reducing the rate of lifetime false positives; in this respect, we believe the performance of the NODS exceeds that of the SOGS.

Patron Survey

It was expected (and the results below confirm) that the adult RDD survey would yield a relatively small number of cases of pathological and problem gamblers. In anticipation of this limitation, NORC was charged with conducting a second survey to generate additional problem and pathological gamblers. An intercept survey of patrons of gaming facilities was selected as the most promising approach—in other words, to go where gamblers are, and especially where more frequent gamblers would be found in concentrated numbers. The research design called for 500 patron interviews to be collected from 5 major facility types in approximate proportion to their estimated share in overall gaming revenues. This distribution was targeted as follows: 170 interviews in lottery ticket outlets (not including locations with video lottery terminals only), 125 in Nevada and New Jersey casinos, 65 in riverboat casinos, 65 in Indian reservation casinos, 40 in pari-mutuel locations, and 40 in locations with video lottery terminals.

NORC first carried out a pilot study, which comprised 86 interviews with randomly selected patrons at three destination-style casinos in Wisconsin and Nevada. This type of facility was viewed as the most difficult in which to successfully conduct such a survey. (These casinos agreed to participate in the pilot study through the offices of the National Indian Gaming Association and the American Gaming Association.)

The pilot survey provided experience with the process of recruiting sites to participate in the survey, as well as with some of the specific methodological features of randomly intercepting and recruiting patrons in these settings (generally in the stream of foot traffic exiting through access doors or corridors), including the feasibility of completing an interview of this length. We shortened the RDD survey instrument by about one-third, to 191 items, to take on average 18 minutes to administer. In addition, the order of questions was revised somewhat for ease of administration in a paper-and-pencil in-person format. The field-test interviews were administered by NORC field interviewers.

Finally, in addition to testing the methods of the patron intercept survey, the pilot study provided confirmation of the expectation that proportionately greater numbers of pathological and problem gamblers might be obtained through this type of survey. Although the pilot survey was too small to confirm this point with counts of these two categories alone, the proportion of at-risk, problem, and pathological gamblers combined was nearly 36 percent in the pilot survey—a much richer concentration of such gamblers than was obtained in the pilot RDD survey.

The design for the patron intercept survey originally called for rotating the periods of data collection throughout business hours, picking 32 data collection sites with 16 interviews per site. The tight schedule for completion of the patron intercept survey, once Commission authorization was obtained, as well as the need to deploy interview resources efficiently, necessitated a revised design. Therefore, we selected fewer sites, took a greater number of cases per site, and standardized the time frames to the busiest

hours of mid-afternoon and mid-evening. At the conclusion of the patron intercept survey, we had completed 530 interviews in 21 facilities (see Table 4).

Table 4. Patron Interviews

Type of Facility	Targeted	Attempted	Completed	Response Rate
Casinos in NV & NJ	125	313	150	48%
Riverboat casinos	65	119	64	54%
Tribal casinos	65	98	67	68%
Lottery (traditional & VLT)	210	313	193	62%
Pari-mutuel	40	225	56	26%
TOTAL	505	1,068	530	50%

The sample facilities were in 7 states from all regions of the country: 4 in the Northeast, with 106 completed interviews; 7 in the North Central region, with 160 interviews; 4 in the South/Southwest, with 110 interviews; and 6 on the West Coast, with 145 interviews.

The patron intercept data were intended as a supplement to the adult telephone survey. Due to the constraints of sample selection and size, the intention was not to view these cases in isolation but to analyze them, to the extent possible, together with the telephone cases, improving the overall precision of our information about frequent players and problem and pathological gamblers. After carefully studying the composition of the patron intercept sample, we arrived at a procedure to combine the samples and re-weight the resulting larger file to accurately reflect the “dual-frame” origin of the respondents (that is, we viewed all adults as having two opportunities to be represented in the sample—to be contacted at home via telephone, and to be intercepted while visiting a gaming facility). We combined the samples by creating a file that included all of the more frequent past-year lottery or casino players from both surveys (intercept patrons not interviewed in casino or lottery sites were included here if they met either the lottery or casino participation criteria in their questionnaire responses). This “players” sample contained about 1,226 individuals (450 from the patron intercept survey and the remainder from the telephone survey) representing about 64 million players.

We then sorted the players from both surveys into 23 groups or “adjustment cells” (described in more detail in Appendix B); each cell included respondents who reported similar frequencies of casino and lottery play and were similar in age. We then took the population estimated to have the characteristics of each of these cells according to the telephone data alone and divided that population number by the number of patron AND telephone cases in the cell. We then assigned this average weight to each of the patron cases, and finally readjusted all the weights to add up once again to the cell’s population. In other words, we had the intercepted patrons *share* the sample weights assigned initially to the telephone cases whom they most resembled in terms of age and past-year gambling behavior. Finally, we recombined these re-weighted cases with all of the telephone cases who were not in the “players” file; none of these other caseweights (adding up to 133 million persons) were changed.

The following table indicates key characteristics of the weighted RDD file, the original unweighted patron file, and the combined, reweighted patron+RDD file.

Table 5. Key Characteristics in RDD, Patron, and Merged Adult Surveys

Demographic Characteristic	RDD (N=2,417)	Patron (N=530)	Patron+RDD (N=2,867)
Sex			
Female	51.9%	43.2%	51.5%
Male	48.1	56.8	48.5
Race/Ethnicity			
White	71.5	71.1	71.4
Black	11.1	20.0	12.2
Hispanic	10.2	4.2	9.3
Other	7.3	4.8	7.1
Age			
18–29	22.5	11.6	22.3
30–39	24.0	16.5	24.0
40–49	20.2	19.8	20.3
50–64	17.1	31.6	17.3
65+	16.2	20.5	16.1
Education			
Less than high school	11.8	15.6	12.3
High school graduate	27.5	34.6	27.9
Some college	31.2	28.5	30.7
College graduate	29.5	21.3	29.1
Income			
Less than \$24,000	34.4	28.5	32.8
\$24,000–49,999	31.2	31.9	31.0
\$50,000–99,999	27.1	28.7	26.7
100,000+	9.4	10.8	9.5
Marital/Parental Status			
Married	58.0	54.8	57.8
Divorced/Separated	10.0	17.3	10.6
Never married	24.7	21.7	25.0
Other marital status	7.4	6.3	6.6
Lives with (minor) children	38.3	27.8	38.3
Employment			
Current Full-time Employment	59.1	51.1	58.0
Part-Time Employment	11.4	10.6	11.9
Not Employed	29.5	39.2	30.1
Distance to major casino			
0–50 miles	21.2	60.8	24.4
51–250 miles	64.1	37.5	61.7
251+ miles	14.7	1.7	13.9
Lottery state	83.7	100.0	84.0
“Professional gambler”	1.0	4.0	1.4
Frequency of Play			
At least weekly lottery	12.3	41.4	12.5
At least monthly other gambling	12.6	49.8	12.0

The patron group was on the whole somewhat more likely than the RDD sample to be male, African American, older than 50, less than college educated, divorced, not employed, not an active parent, and living close to a major casino and in a lottery state. Some of these characteristics are also likely to be associated to some extent with under-representation in a telephone sample. More to the point of carrying out the patron survey,

the patrons were three to four times more likely to play the lottery at least once a week, gamble in other venues at least once a month, and (albeit only a small fraction) consider themselves to be “professional” gamblers.

Prevalence Rates

Prevalence rates are based on the proportion of respondents who score on increasing numbers of items that make up the lifetime scale used in the survey. Table 6 presents information about the proportion of respondents who scored at particular levels on the lifetime NODS screen in the RDD survey, the patron survey, and the combined sample (which pools past-year casino and lottery players from the patron survey). The classifications, as discussed above, are nongamblers, low-risk gamblers (limited gambling losses or zero DSM–IV problem criteria), at-risk gamblers (affirmed one or two criteria), problem gamblers (affirmed three or four criteria), or pathological gamblers (affirmed five or more criteria).

As we display in Table 6, about one in seven (or 29 million) adults have never gambled, and about 148 million adults are low-risk gamblers. At the other end of the spectrum are pathological gamblers, who comprise about 0.8 percent of the adult population based on the RDD sample alone. Problem gamblers comprise another 1.3 percent of the adult population, based on the RDD sample, and 1.5 percent based on the combined sample. Our best estimate based on the combined sample is that there are about 2½ million pathological gamblers, 3 million problem gamblers, and 15 million at-risk gamblers in the United States.

Table 6. Percentage Gambling Types Based on Lifetime and Past-Year NODS Scores

	RDD Survey				Patron Survey				Combined (Patron+RDD)			
	%		N		%		N		%		N	
	Life-time	Past Year	Life-time	Past Year	Life-time	Past Year	Life-time	Past Year	Life-time	Past Year	Life-time	Past Year
TOTAL	100.0	100.0	2,417	2,417	100.0	100.0	530	530	100.0	100.0	2,867	2,867
Nongambler	14.4	36.7	342	898	0.6	2.8	3	15	14.4	36.7	342	898
Low-Risk	75.6	60.4	1,841	1,452	68.3	72.6	362	385	75.1	59.1	2,145	1,784
At-Risk	7.9	2.3	183	55	17.9	14.3	95	76	7.7	2.9	267	125
Problem	1.3	0.4	30	9	5.3	4.9	28	26	1.5	0.7	56	33
Pathological	0.8	0.1	21	3	7.9	5.3	42	28	1.2	0.6	57	27

The higher rates of at-risk, problem, and pathological gambling in the patron survey confirm the expectations of the patron pilot survey, although that survey was carried out only in casinos.⁴

⁴ The division of gambling types among patrons at particular types of gambling facilities was a particular interest of the Commission. As the table below indicates, the sample sizes, as well as the small number of sites for each detailed facility type within the patron database, render hazardous any attempt to generalize from the patron data alone. On a self-weighted basis, 13.2 percent of the patrons interviewed were problem or pathological gamblers, and 17.9 percent were at-risk gamblers. The pari-mutuel patrons at the three race-

As in other surveys, prevalence rates in the national survey are different among the various subgroups of the population. Table 7 shows lifetime prevalence of gambling type by demographic characteristics in both the RDD and combined surveys.

Table 7. Lifetime and Past-Year Prevalence of Gambling Problems Among Demographic Groups, in Percentages

Demographic Characteristic	RDD Survey (%)			RDD+Patron Survey (%)		
	At-Risk (n=183)	Problem (n=30)	Path. (n=21)	At-Risk (n=267)	Problem (n=56)	Path. (n=67)
	Life/Year	Life/Year	Life/Year	Life/Year	Life/Year	Life/Year
Gender						
Male	9.6 / 3.2	1.6 / 0.4	0.9 / 0.1	9.6 / 3.9	2.0 / 0.9	1.7 / 0.8
Female	6.3 / 1.6	1.0 / 0.4	0.7 / 0.2	6.0 / 2.0	1.1 / 0.6	0.8 / 0.3
Race						
White	6.8 / 2.2	1.2 / 0.2	0.6 / 0.1	6.8 / 2.7	1.4 / 0.6	1.0 / 0.5
Black	8.1 / 2.9	2.3 / 1.2	1.9 / 0.0	9.2 / 4.2	2.7 / 1.7	3.2 / 1.5
Hispanic	13.7 / 3.6	0.8 / 0.8	0.9 / 0.0	12.7 / 3.7	0.9 / 0.7	0.5 / 0.1
Other	9.6 / 1.4	1.1 / 0.5	0.6 / 0.3	8.8 / 1.8	1.2 / 0.5	0.9 / 0.4
Age						
18–29	10.3 / 4.3	1.9 / 0.8	1.2 / 0.1	10.1 / 3.9	2.1 / 1.0	1.3 / 0.3
30–39	6.9 / 1.4	1.0 / 0.4	0.5 / 0.2	6.9 / 2.1	1.5 / 0.8	1.0 / 0.6

tracks visited by interviewers differed significantly from the other five types in their distribution of gambling types; there were no statistically significant differences among the first five facility types. The past-year NODS distributions were very similar to the lifetime but at lower levels: 10.2 percent of all patrons were problem or pathological gamblers, and 14.3 percent were at-risk gamblers; across the six facility types from Nevada/Atlantic City casinos to pari-mutuel, pathological and problem gamblers were 6.7, 14.1, 10.5, 6.1, 6.7, and 28.5 percent of patrons, respectively.

On a more generalizable basis, patterns of lifetime prevalence were calculated using the combined RDD+Patron data file for past-year patrons (more than one visit) of Nevada and Atlantic City casinos, riverboats, tribal casinos, traditional lottery outlets, stores/bars restaurants with VLTs or other electronic devices, and pari-mutuel racetracks. The percentages of pathological and problem gamblers at these sites were, respectively, 8.5, 9.6, 7.7, 3.8, 5.3, and 15.1 percent. These results indicate that, among the most common gambling venues, multi-visit lottery patrons in general have the lowest prevalence of pathological and problem gambling; casino patrons have higher prevalence rates, with small differences by type of casino; and pari-mutuel patrons have the highest prevalence rates.

Table a. Percentage of Gambling Types Based on NODS Lifetime Score, by Gambling Venue—Patron Data Only

Type of Gambler	NV/AC Casino (5)		Riverboats (3)		Tribal Casino (2)	
	%	N	%	N	%	N
TOTAL	100.0%	149	100.0%	64	100.0%	67
Nongambler	0.7	1	0	0	0	0
Low-Risk	68.4	102	67.2	43	73.1	49
At-Risk	22.1	33	15.6	10	16.4	11
Problem	3.4	5	6.3	4	6.0	4
Pathological	5.4	8	10.9	4	4.5	3
Type of Gambler	Lottery Outlets (6)		VLT Locations (2)		Pari-Mutuel (3)	
	%	N	%	N	%	N
TOTAL	100.0%	164	100.0%	30	100.0%	56
Nongambler	0	0	0	0	3.4	2
Low-Risk	78.1	128	70.0	21	33.9	19
At-Risk	12.8	21	23.3	7	23.2	13
Problem	3.7	6	3.3	1	14.3	8
Pathological	5.5	9	3.3	1	25.0	14

Table 7. Lifetime and Past-Year Prevalence of Gambling Problems Among Demographic Groups, in Percentages

Demographic Characteristic	RDD Survey (%)			RDD+Patron Survey (%)		
	At-Risk (n=183)	Problem (n=30)	Path. (n=21)	At-Risk (n=267)	Problem (n=56)	Path. (n=67)
	Life/Year	Life/Year	Life/Year	Life/Year	Life/Year	Life/Year
40–49	9.2 / 2.3	1.5 / 0.5	0.9 / 0.3	8.9 / 3.3	1.9 / 0.7	1.4 / 0.8
50–64	5.3 / 2.3	1.7 / 0.0	1.1 / 0.0	6.1 / 3.6	1.2 / 0.3	2.2 / 0.9
65+	6.9 / 1.3	0.2 / 0.2	0.1 / 0.0	6.1 / 1.7	0.7 / 0.6	0.4 / 0.2
Education						
Less than HS	10.7 / 1.6	1.4 / 0.9	1.2 / 0.0	10.0 / 2.4	1.7 / 1.2	2.1 / 1.0
HS graduate	8.6 / 3.2	1.7 / 0.3	0.9 / 0.3	8.0 / 3.5	2.2 / 1.1	1.9 / 1.1
Some college	7.8 / 2.9	1.4 / 0.7	0.9 / 0.1	7.9 / 3.5	1.5 / 0.8	1.1 / 0.3
College graduate	6.1 / 1.4	0.7 / 0.0	0.3 / 0.0	6.4 / 2.0	0.8 / 0.2	0.5 / 0.1
Income						
Less than \$24,000	8.0 / 2.7	1.0 / 0.3	1.0 / 0.2	7.3 / 2.6	1.6 / 0.7	1.7 / 0.9
\$24,000–49,999	7.2 / 2.7	2.1 / 0.6	0.8 / 0.1	6.9 / 3.2	1.8 / 0.9	1.4 / 0.6
\$50,000–99,999	7.6 / 1.7	1.0 / 0.4	0.7 / 0.1	8.0 / 2.5	1.3 / 0.7	0.9 / 0.2
\$100,000+	12.3 / 2.2	0.9 / 0.2	0.6 / 0.0	13.4 / 4.9	1.4 / 0.4	0.7 / 0.2
Marital status						
Married	6.0 / 1.6	0.9 / 0.5	0.8 / 0.2	5.9 / 1.9	1.0 / 0.8	1.0 / 0.3
Divorced/separate	8.9 / 2.0	1.2 / 0.0	1.0 / 0.0	9.9 / 4.7	1.7 / 0.9	3.0 / 1.7
Never married	11.6 / 3.9	2.1 / 0.4	0.8 / 0.1	11.4 / 4.3	2.6 / 0.8	1.2 / 0.7
Cohabiting	8.1 / 4.4	1.8 / 0.6	1.3 / 0.0	6.8 / 3.2	1.2 / 0.2	0.8 / 0.0
Widowed	8.9 / 1.9	1.5 / 0.0	0.0 / 0.0	7.3 / 1.7	0.5 / 0.0	0.0 / 0.0
Minor children						
None	7.9 / 2.4	1.3 / 0.3	0.4 / 0.0	7.7 / 3.1	1.6 / 0.7	1.0 / 0.5
One or more	7.7 / 2.3	1.2 / 0.6	1.4 / 0.2	7.8 / 2.7	1.3 / 0.9	1.6 / 0.6
Employment						
Full-time	8.5 / 2.5	1.4 / 0.5	0.9 / 0.1	8.5 / 3.0	1.5 / 0.7	1.5 / 0.6
Part-time	4.6 / 0.7	0.0 / 0.0	0.6 / 0.5	5.3 / 2.1	0.3 / 0.0	0.8 / 0.6
Not employed	7.9 / 2.7	1.5 / 0.3	0.6 / 0.1	7.3 / 3.2	2.1 / 1.0	1.0 / 0.4
Region						
Northeast	10.1 / 3.4	1.4 / 0.0	0.5 / 0.0	8.8 / 2.9	0.8 / 0.0	0.4 / 0.0
South	5.8 / 2.1	0.9 / 0.6	1.2 / 0.2	5.9 / 2.2	1.1 / 0.6	1.2 / 0.4
Midwest	5.3 / 1.6	1.2 / 0.1	0.6 / 0.2	6.0 / 2.7	1.6 / 0.7	1.5 / 1.0
West	12.9 / 2.9	2.0 / 0.7	0.5 / 0.0	12.1 / 4.3	2.3 / 1.4	1.4 / 0.6
Lottery state						
No	4.5 / 2.8	1.4 / 0.8	1.4 / 0.1	4.6 / 2.9	1.4 / 0.7	1.5 / 0.2
Yes	8.5 / 2.3	1.3 / 0.3	0.7 / 0.1	8.3 / 2.9	1.5 / 0.7	1.2 / 0.6
Distance to casino						
0–50 miles	6.7 / 2.1	1.6 / 0.2	0.5 / 0.0	7.4 / 4.1	2.3 / 1.1	2.1 / 1.3
51–250 miles	8.7 / 2.3	1.3 / 0.5	0.7 / 0.1	8.5 / 2.6	1.2 / 0.6	0.9 / 0.3
250+	6.0 / 2.9	1.0 / 0.3	1.2 / 0.4	5.5 / 2.6	1.2 / 0.3	1.3 / 0.4
Professional gambler						
No	7.8 / 2.3	1.3 / 0.3	0.7 / 0.1	7.6 / 2.9	1.5 / 0.7	1.1 / 0.5
Yes	14.7 / 5.9	5.9/11.8	11.8 / 0.0	19.2/11.4	2.9 / 7.2	19.8/10.4

Several interesting observations can be made based on this table and associated tests of statistical significance (every specific difference in our findings that is noted in the

following discussion has a 5 percent or less likelihood of arising by chance). First, with regard to sex, we found that prevalence rates of problem and pathological gambling tended to be higher among men than women in the RDD survey, but not to statistical significance. However, significantly more at-risk male gamblers were present in this sample than at-risk female gamblers. When we increased the sample size by merging the RDD and patron survey data, analysis revealed that rates of at-risk, problem, and pathological gambling were all higher among men.

When we examined differences by age, we found that persons 65 years and older were substantially less likely to be at-risk, problem, or pathological gamblers than those in younger age groups. The prevalence rates of at-risk, problem, and pathological gambling are also higher among African Americans than whites in the combined survey (the difference in the RDD survey reaches significance only for pathological gamblers). In the combined survey data, the prevalence of at-risk and problem gambling is higher among the never married than those who are married, and divorced people have higher prevalence rates of pathological, problem, and at-risk gambling than married people. Prevalence is higher among respondents living with minor children in the household than among those without minor children in the household, but this may be due to the different age and sex profile of people living with minors (more of whom are women and under 65) versus those who are not.

Finally, about 1 percent of respondents in the telephone survey identified themselves as “professional gamblers.” Problem and pathological gambling are both present at elevated rates in this group. The DSM–IV states that professional gamblers, who limit their risk-taking and gamble in a “disciplined” way may relate somewhat differently to the screening items than other gamblers. However, the DSM–IV does not suggest that professionals are immune to gambling problems, any more than professional bartenders are immune to alcohol problems; nor does the DSM–IV recommend (or have a basis to recommend) that the screening criteria be modified for this subgroup. The evidence of our survey suggests that persons who consider themselves professional gamblers do not necessarily earn their entire living or even a significant part of it by gambling.

Regional Differences and Availability

In summarizing the results of a large number of prevalence studies conducted throughout the United States, Cox, Lesieur, Rosenthal, and Volberg (1997) noted that prevalence rates tend to be lowest in the Midwest and higher in the Northeast. This cross-jurisdictional analysis also showed that prevalence rates are highest in southern states like Louisiana and Mississippi, where the availability of legal gambling has increased rapidly, where the population is ethnically diverse, and where socioeconomic levels are relatively low. In the national survey, prevalence rates of pathological and problem gambling are lowest in the Northeast and highest in the West.

The availability of a state-owned lottery has a statistically significant association with the prevalence of at-risk gambling (which increases about 80 percent, in parallel with the generally greater past-year lottery play in these states, 55 percent versus 33 percent). However, the difference in prevalence of problem and pathological gamblers hovers at the edge of statistical significance, and is in the opposite direction. The availability of a casino within 50 miles (versus 50–250 miles) is associated with a higher prevalence (about double) of problem and pathological gambling in the combined survey results,

parallel with the general difference in levels of past-year casino gambling (40 percent among adults within 50 miles, vs. 23 percent of adults 50–150 miles). However, we found little difference in the prevalence of at-risk gambling in the combined survey, and differences in prevalence were not statistically significant in the RDD survey.

Attitudes Toward Gambling

It is interesting to examine general attitudes toward gambling among problem and pathological gamblers. One might assume that despite their gambling-related difficulties, problem and pathological gamblers enjoy gambling and believe that it is generally a good thing for society. However, Table 8 shows that nearly half of all pathological gamblers, as identified by lifetime NODS scores, believe that the overall effect of legalized gambling on society is either bad or very bad; these attitudes are more negative than for any other group of gamblers. When the smaller groups with positive past-year NODS scores are examined, gamblers at every problem level are less negative about the impact of gambling (conversely, the group that did not gamble in the past year is much larger than just the lifetime nongamblers, and generally more negative about gambling).

Respondents in the national survey were also asked about their reasons for gambling. Table 8 shows that the majority of at-risk, problem, and pathological gamblers gamble for excitement or challenge, and in this respect are quite different from low-risk gamblers. A great majority of at-risk, problem, and pathological gamblers also gamble in order to win money, and in this respect they also differ from low-risk gamblers. Finally, we found no statistically significant differences among these groups in the extent to which they gamble with friends or family, except that pathological gamblers exceed others. All of these results are the same whether the past-year or lifetime NODS is used.

Table 8. Attitudes Toward Gambling in RDD+Patron Survey, by Lifetime and Past-Year Gambler Type

Attitude Toward Gambling	Low Risk	At Risk	Problem Gamblers	Path. Gamblers
	Life/Year	Life/Year	Life/Year	Life/Year
Overall impact is bad/very bad	32 / 24%	21 / 11%	27 / 18%	49 / 19%
Excitement is important/very imp	35 / 36	63 / 81	83 / 93	85 / 87
Winning money important/very imp	62 / 63	79 / 88	89 / 84	95 / 94
Usually gamble with friends, family	64 / 65	70 / 64	62 / 71	81 / 81

Correlation with Other Disorders

Finally, it is useful to compare problem and pathological gamblers to others in the national survey in terms of physical and psychological disorders and other kinds of troubles in life. Table 9 shows the percentages of gamblers and nongamblers who have experienced some of these problems. Lifetime pathological gamblers are twice as likely as other gamblers (31 percent versus about 15 percent, with nongamblers, an older group, falling in between) to describe their general health over the past 12 months as fair or poor. Lifetime pathological and problem gamblers are twice as likely as all other groups (13 percent versus 6 to 7 percent) to have sought professional help for emotional or mental health problems in the past year. Lifetime pathological and problem gamblers are more likely than at-risk gamblers (42 percent, versus 27 percent) to acknowledge being

somewhat or very troubled by their emotions, nerves or mental health; lifetime at-risk gamblers are in turn more likely than lifetime low-risk gamblers (16 percent), who are more likely than persons who have never gambled (11 percent) to affirm this.

Table 9. Percentage of Lifetime and Past-Year Gambler Types by Health, Mental Health, Substance Abuse, and Other Problems

Problem	Non-gamblers		Low-Risk Gamblers		At-Risk Gamblers		Problem Gamblers		Path. Gamblers	
	Life-time	Past Year	Life-time	Past Year	Life-time	Past Year	Life-time	Past Year	Life-time	Past Year
Health poor/fair, past year	22.8	21.0	14.0	12.3	15.7	13.2	16.3	22.6	31.1	29.6
Mentally troubled (currently) (RDD only)	10.7	14.6	15.9	17.1	26.5	28.5	42.3	24.2	41.9	66.5
Mental health tx, past year	5.1	6.9	6.8	6.3	6.4	10.1	12.8	5.4	13.3	12.9
Emotionally harmful family argument about gambling	NA	0.5	0.1	0.3	0.8	6.8	15.8	10.5	53.1	65.6
Manic symptoms, ever	NA	0.7	NA	1.6	11.3	17.6	16.8	13.4	32.5	40.1
Depressive episode, ever (RDD only)	NA	0.1	NA	1.0	8.6	17.4	16.9	5.2	29.1	20.0
Alcohol/drug dependent, ever (RDD only)	1.1	0.9	1.3	1.8	5.6	13.3	12.4	13.9	9.9	20.0
Drug use 5+ days, past year	2.0	2.4	4.2	5.1	9.2	13.5	16.8	16.1	8.1	13.9
Any job loss, past year	2.6	4.8	3.9	3.6	5.5	2.1	10.8	0.0	13.8	25.0
Bankruptcy, ever	3.9	3.3	5.5	6.4	4.6	10.9	10.3	13.8	19.2	10.7
Arrested, ever	4.0	7.0	10.0	11.9	21.1	25.7	36.3	25.0	32.3	26.4
Incarcerated, ever (RDD only)	0.4	—	3.7	—	7.8	—	10.4	—	21.4	—

The survey questionnaire includes screens for manic or depressive episodes, that is, questions asking whether a respondent ever displayed certain symptoms that are strongly indicative of manic or depressive episodes. The depression items led, if answered positively, to a full series of DSM–IV diagnostic questions, but this series was only used with respondents scoring one or more points on the NODS; other national surveys estimate general prevalence with the same questions. The manic screening items were asked only of respondents who scored one or more points on the NODS. This helps shed further light on the “manic episode” exclusion for the psychiatric disorder of pathological gambling, but we do not attempt to implement this exclusion. It has not been implemented in previous studies using the DSM–IV criteria, nor is there an underlying research base to indicate how it would be implemented, and therefore no research to validate an exclusion procedure (Lesieur and Rosenthal, 1998).

Table 9 shows that lifetime and past year pathological gamblers are significantly more likely than other risk respondents to have symptoms associated with manic disorder. The lifetime prevalence of major depressive episode among problem and pathological gamblers is significantly higher than that observed in the general population in other surveys, and a definite downward trend is noted from those with the most to least severe gambling problems in our sample. Table 9 also shows that both lifetime and past-year respondents reporting at-risk, problem, and pathological gambling are more likely than low-risk or nongamblers to have ever been alcohol or drug-dependent and to have used illicit drugs in the past 12 months. Lifetime , as well as to have ever been arrested or

incarcerated. Finally, pathological and problem gamblers are more likely than any other group to have lost a job in the past year and to have ever declared bankruptcy.

Gambling Expenditures

One expectation of our survey work was that it would enable us to estimate the proportion of gaming revenues associated with problem and pathological gamblers. There are two principal obstacles to this enterprise. First, a certain fraction of gaming revenues, particularly in destination-style casinos but also in certain high-stakes lotteries, have historically been derived from a relatively small number of high-end players, many of whom are not U.S. residents. Therefore, estimates based on a survey that does not sample from this special stratum must restrict its scope of generalization to exclude reference to these very wealthy players. Because these players are so few in number, determination of the population prevalence and correlates of problem and pathological gambling are not affected by their absence from the survey. However, due to the amount of money that these individuals put into play at casinos (and to an evidently much lesser extent in other games), any denomination of gambling in monetary units will be missing this component.

The second problem is the weakness in individuals' reports of gambling winnings and losses. Virtually none of the survey data on the reported amounts "ahead" or "behind" (won or lost) appears to be accurate at face value, when compared with official statistical data on regulated games. An exception is lottery play, for which we were able to reconcile the survey data quite well with officially counted sales receipts. This exception is probably due to the more routinized purchase patterns of most lottery play, compared with the way that betting and payoffs take place in other games with faster, more complicated, and more interactive formats. But here as well, the net win/loss data vary appreciably from what ticket buyers are known to spend and not recover through winning tickets. Instead of a careful, computer-like accounting for gaming dollars, individuals tend to understate their net losses and exaggerate their net wins, particularly when accounting for expenditures in private settings.

Table 10, which is based on the RDD questionnaire data (which covered gambling wins and losses much more extensively than the patron questionnaire; but see footnote 4 below), displays gambling win, loss, and expenditure totals for five types of gambling, in total and by type of gambler. The table provides numerous instances of non-credible overall results—for example, the results of adding up reports of lottery ticket purchases, on the one hand (expenditure data), and on the other, how much the survey respondents thought they were ahead (won) or behind (lost) over the course of a year. The annual information is calculated separately from two kinds of questions—items about the last day the respondent gambled, which are summed up taking account of the reported number of days gambling each year, and a direct question about past-year gambling wins or losses.

Table 10. Estimated Annual Amount Ahead, Behind, or Spent (in Millions of Dollars) in the Past Year, 1998 (from RDD Data)

	Casino				Track				
	Last-Day Sums		Past Year		Last-Day Sums		Past Year		
	Ahead	Behind	Ahead	Behind	Ahead	Behind	Ahead	Behind	
Total	\$35,555 (100.0)	\$30,460 (100.1)	\$9,461 (100.0)	\$6,134 (100.0)	\$9,580 (100.0)	\$3,855 (100.0)	\$2,903 (100.0)	\$1,003 (100.0)	
Gambler type reporting amount									
Low-Risk	28,050 (78.9)	12,751 (41.9)	6,996 (73.6)	3,265 (53.2)	8,431 (88.0)	3,033 (78.7)	2,398 (82.6)	672 (67.0)	
At-Risk	2,715 (14.7)	13,351 (43.8)	900 (9.5)	1,514 (24.7)	873 (9.1)	873 (19.8)	411 (14.2)	176 (21.3)	
Problem	1,995 (5.6)	3,351 (11.3)	1,562 (16.5)	601 (9.8)	166 (1.7)	61 (1.6)	94 (3.2)	121 (12.1)	
Pathological	279 (0.8)	1,007 (3.3)	33 (0.3)	754 (12.3)	111 (1.2)	—	1 (0.1)	35 (3.4)	
	Private				Lottery		Unlicensed		
	Last-Day Sums		Past Year		Past Year		Past Year		
	Ahead	Behind	Ahead	Behind	Ahead	Behind	Total \$	Ahead	Behind
Total	\$23,860 (100.0)	\$3,412 (100.0)	\$4,090 (100.0)	\$336 (100.0)	\$1,420 (100.0)	\$6,099 (100.0)	\$25,270 (100.0)	\$2,419 (100.0)	\$444 (100.0)
Gambler type reporting amount									
Low-Risk	18,990 (79.6)	1,564 (45.8)	2,165 (52.9)	241 (71.7)	1,324 (93.2)	3,958 (64.9)	18,670 (73.9)	1,855 (76.7)	221 (49.7)
At-Risk	4,528 (19.0)	117 (6.5)	265 (6.5)	85 (25.3)	81 (5.7)	1,647 (27.0)	4,560 (18.0)	276 (11.4)	173 (39.0)
Problem	342 (1.4)	1,732 (40.5)	1,657 (40.5)	1 (0.3)	15 (1.1)	411 (6.7)	1,742 (6.9)	288 (11.9)	38 (8.6)
Pathological	—	—	3 (0.1)	8 (2.4)	—	84 (1.4)	297 (1.2)	—	12 (2.7)

The total spending estimate for lottery tickets using the RDD data only is 25.5 billion. This figure is approximately 20 percent below the national lottery sales figures for 1998 sales cited by Clotfelter, Cook, Edell, and Moore (1999) in their analysis of lottery gambling for the Commission.⁵ However, to be consistent, the same players in the survey, when asked to estimate their *net* receipts, should have reported losses of

⁵ The combined RDD+patron data on lottery expenditures, in contrast to other data in Table 10, are more complete than the RDD alone. Using the combined data set, we calculated the total lottery expenditures in the past year to be \$31.5 billion, which is very similar to the figures cited by Clotfelter and colleagues for 1998 national lottery sales. However, Clotfelter and colleagues arrived at their own survey-based estimate for total national expenditures on lottery tickets (based on the same combined data set) by using a more complex summing algorithm to quantify the frequency-of-play response categories in the NORC questionnaire, as well as a series of post hoc adjustment factors designed to match the survey estimates for each major lottery type with the FY1998 sales figures published by LaFleur (www.lafleurs.com). When we used the same program code (Malme, private communication) to calculate the distribution of expenditures by type of gambler, we calculated the percentage of the \$31.9 billion total expenditure by low-risk, at-risk, problem, and pathological gamblers at 67.5 percent, 18.0 percent, 7.9 percent, and 6.6 percent, respectively—statistics which are very close to our estimates based on the combined data (67.0, 18.8, 7.6, and 6.6), which are similar to those in Table 10 except that the RDD data ascribe a much lower percentage of lottery expenditures to pathological gamblers.. Further analytic explorations of these data, as well as further methodological research on how to elicit the most accurate expenditure information, will undoubtedly prove useful to students of lottery play.

approximately \$14 billion, reflecting the percentage of lottery expenditures not returned to ticket-holders. Instead, the data equate to a net loss of \$4.7 billion, reflecting \$1.4 billion in winnings (claimed by about 8 percent of all the past-year players) and \$6.1 billion in losses (contributed by about 85 percent of players); the remaining 7 percent “broke even.” This loss is about one-third what it should have been based on the survey-expenditures captured in the RDD data, and about one-fourth the actual amount lost according to the official sales data.

Undercounting of losses and/or overcounting of winnings are also evident for other forms of gambling, both for wins and losses across the past year as well as on the last day respondents gambled. The balance of past-year casino wins and losses for last-day and past-year items shows patrons ending up with a \$5 billion or \$3 billion windfall, instead of leaving more than \$20 billion at tables and machines—the revenues reported by the casino industry. The same reversals hold for tracks and for unlicensed betting, comprised largely of sports books.

Most revealing of the rosiness of the collective view of gambling results is private gaming, largely at cards, in which there is no “house” or commercial intermediary to remove money from players’ wins and losses. In private bets, all of the wins and losses should balance. However, the last-day-based and past-year aggregates from the survey show the amounts won exceeding the amounts lost by factors of seven and twelve, respectively. Unlike lottery play, in which 85 percent of buyers consider themselves net losers and 8 percent net winners (a 1:10 ratio), in private games, on the last day of play there were 3 self-reported winners for each loser (3:1), and over a year’s time, five overall winners for every three losers (5:3). While these ratios are not inherently impossible, since they might imply that each losers’ money was spread out across a larger number of (smaller) winners, the individual amounts reported as won and lost by each group actually greatly exaggerate, rather than reduce, this disparity in numbers of winners and losers.

Despite the lack of realism in the overall estimates of monetary wins and losses, there is some degree of information in the extent to which problem and pathological gamblers account for the amounts in both the win and loss columns (and in the case of lotteries, the expenditure column). Discounting the impossible sums of conjured winnings in private games, most of the money actually and reportedly changing hands is in lotteries, casinos, and pari-mutuel betting, and these are the estimates for which the number of respondents reporting win/loss data are the largest.

In lottery play, problem and pathological gamblers account for 8 percent of total expenditures (but 14.2 percent in the combined survey data for this measure), 8.1 percent of past-year losses, and 1.1 percent of past-year winnings. In casino play, problem and pathological gamblers account for 22.1 percent of past-year losses, 14.3 percent of last-day-based losses, 16.8 percent of past-year winnings, and 6.4 percent of last-day-based gains. In pari-mutuel betting, problem and pathological gamblers account for 15.5 percent of past-year losses, 3.3 percent of past-year winnings, none of the last-day-based losses, and 1.2 percent of last-day-based winnings..

Overall, when we sum up these data, similar information on the less frequently played games, and parallel monetary items such as the amount of money taken to gamble with or how much the person was willing to lose, these sums converge on the estimate that about

15 percent of the dollars lost gambling are lost by problem and pathological gamblers. These figures well exceed the percentage of problem and pathological gamblers in the general population, but not by so much as to dominate the economics of gambling. Perhaps a more general finding from these data is that gamblers, whether or not they are classifiable as problem or pathological, seem accustomed to a fairly high level of wishful thinking about the economics of the games they play.

Assessing Problem and Pathological Gambling in the Future

The issues surrounding legal gambling have become far more complex than they were when the last Commission published its report in 1976. Policy makers, government agencies, gambling regulators, and gaming operators are concerned about the likely impacts of changing mixes of legal gambling on the gambling behavior of broad segments of the population, as well as on the prevalence of gambling-related difficulties. Public health researchers and social scientists are concerned with minimizing the risks of legal gambling to particular subgroups in the population. Economists, financial institutions, and law enforcement professionals are concerned about the relationship between legal gambling and bankruptcies, gambling and crime, and the reliance of the gaming industries on problem gamblers for revenues. Treatment professionals, government agencies, and not-for-profit organizations are concerned about how to allocate scarce resources for the prevention and treatment of gambling problems (Volberg 1998b). Finally, groups opposed to the expansion of legal gambling are now working to prevent the further expansion of legal gambling and to repeal existing activities.

Like much of science, measurement is a developmental process. Instrumentation is always a reflection of the work that researchers are doing to identify and describe the phenomena in which they are interested. As research on problem gambling continues, our systems change for classifying problem gamblers. The SOGS represents a culturally and historically situated consensus about the nature of gambling problems. As research continues and as the definitions of problem gambling change, new instruments and new methods for estimating prevalence in the general population and for testing models of gambling behavior will continue to emerge. These emerging methods must be tested against each other and against the SOGS in order to advance the field of problem gambling research in an orderly manner, ensuring the relevance of past work as well as work in the future.

There are several areas for which we would recommend future research investments. Much more work needs to be done with the patron intercept methodology as a way to capture frequent players. This type of survey work requires cooperation between researchers and the gaming industry, which will undoubtedly increase as the importance and value of onsite research findings becomes more widely understood. Research is also needed on the efficacy of treatment for gambling problems, both through voluntary support groups and professional channels. Finally, longitudinal studies are needed that can extrapolate across 20-year spans or longer on the “careers” or “natural history” of gambling and related disorders.

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