

TRANSITION PLANNING ASSOCIATES

A SURVEY OF PATHOLOGICAL GAMBLERS

IN THE STATE OF OHIO

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Executive Summary

1. "Fully 194 of those surveyed described themselves as frequent or occasional gamblers, for a rate of participation in games of chance of 24.2%." Chapter 2, page 16.

2. Participation increased for six out of twelve games of chance. "Yet only two of these games, state-sponsored lotteries and office pools, ranked among the top 5 games in terms of frequency of play in either year. Conversely, three of the top 5 games declined." Chapter 3, page 18.

3. "In total, 151 gamblers, or 78% of all gamblers, placed a wager in both 1981 and 1984. These can be called chronic gamblers." Chapter 3, page 19.

4. "Proceeding further, if all those who intend to spend more on gambling in 1985 (16 cases) are subtracted from those 88 who actually increased their wagers between 1981 and 1984, the remainder, 72 cases, or 81.81% of the progressive gamblers, represents a conservative estimate of those whose observed betting behavior between 1981 and 1984 conflicts with their expressed intention to cutback or hold steady in 1985. These are gamblers who want to reduce their

gambling behavior despite a history of progressive involvement." Chapter 3, page 19.

5. "In conclusion, then, with regard to the evidence of gamblers' conscious control over their involvement with games of chance, it appears that, in general, what gamblers intend to do is out of step with what they actually do. Their determination to consciously decide on a steady level of expenditure on gambling is not corroborated by the evidence that gamblers are more than 5 times as likely to either increase or decrease their total annual wagers as they are to hold steady in their gambling behavior over time.⁷ The odds in favor of increasing rather than decreasing one's gambling expenditures are 2.25 to 1. Among those who increase their gambling expenditures, 81.81% express a desire to cutback or hold steady in 1985." Chapter 3, page 20.

6. "An incongruity between intention and behavior burdens the lives of a considerable number of ordinary gamblers." Chapter 3, page 21.

7. "In order to construct a discriminance test, variables must be identified which reliably sort a sample into those at risk of gambling pathology and those who are not at risk.

Historically, the ISR test established a precedent in this field of research." Chapter 4, page 22.

8. "In the absence of the discriminant weights, it was thought necessary to check the performance of the test variables in some manner which would account for discriminance and association..."..at five probability of inclusion levels. Chapter 4, page 24. "It is evident that the .2 cutoff point maximizes both discriminance and association." page 25.

9. "The remaining ISR variables (nine ineffective variables were dropped) were re-grouped into a more efficient discriminance test with a probability-of-inclusion level of .2. The gamblers were re-tested. The discriminance yielded a group of 21 gamblers in the "at-risk" pool and 172 gamblers in the "not-at-risk" pool. A difference-of-means test showed that, after controlling for the internal group variances, the between group variance was significant below the .0001 level. This statistic indicates that there is near certainty that the two groups are composed of individuals drawn from distinctly different populations, presumably pathological gamblers and non-pathological gamblers." Chapter 4, page 27.

10. "The model of the 1975 ISR prevalence rate was applied to the 1985 survey of Ohio."The statistical portion of the model extends only to the identification of the "at-risk" pool. The further differentiation of five sub-categories of respondents in the "at-risk" pool was accomplished by means of subjective inspection by the ISR research team." Chapter 5, page 28.

11. "The further differentiation of sub-classifications within the 1985 "at-risk" pool could not be executed by simply applying the ratios originally derived from the subjective inspection of the 1975 "at-risk" pool. Therefore the entire "at-risk" pool must be interpreted at face value: namely, as the group of gamblers who are "at-risk" of gambling pathology. There are 21 such cases in the Ohio sample, or 2.62%. By means of a separate, more specifically diagnostic test administered to all 194 gamblers, 8 cases of gambling pathology were diagnosed. This represents .998% of the entire sample," Chapter 5, pages 33.

12. "In conclusion, although the subjective inspection of the "at-risk" pool had been replaced by the diagnostic test, the overall impression derived from a comparison of the 1975 and the 1985 results is that there may have been an increase in the observable prevalence rate of pathological gambling

in the state of Ohio of 29.61% among those evidencing the "hard" signs of pathology" (Chapter 5, page 33).

13. In order to evaluate the ISR test, variables which describe the clinical signs of gambling pathology were grouped into a series of tests. "Nearly three times as many gamblers (280%) scored on at least one test as did not score at all. This, in itself, is a notable finding because the impression given by the ISR test is that only a small portion (2.62%) of all gamblers run any risk of gambling pathology." Chapter 6, page 38.

14. "The second major finding from table 14 is that 24 of the 194 gamblers (12.37%) admit to 3 or more of the clinical signs. According to table 13, the odds that these 24 are pathological gamblers are 45,000 to 1 or more." Chapter 6, page 39.

15. The median annual wager in both 1981 and 1984 was approximately \$170. The median change in annual wagers during this time was +\$10.00. Chapter 6, page 41-42.

16. "Note that among those who increased their gambling during the period, 43 gamblers more than doubled their wagers and 40 held their increases to less than 100%. Therefore, it would be fair to say that progressivity

usually leads, not to gradual increases in gambling expenditures, but very dramatic increases." Chapter 6, page 42.

17. "These tests show that progressivity may be a necessary condition of pathological gambling but it is certainly not a very good predictor of the disease among Ohio's citizens." Chapter 6, page 44.

18. "In general, the ISR risk classifications are not statistically associated with the distribution of clinical scores. It makes little difference how the ISR test classifies a case for purposes of predicting the number of clinical signs which it will register. Therefore, the ISR and clinical signs tests are not mutually corroborating." Chapter 6, page 45.

19. "The evidence suggests that as incomes rise cumulative scores on the clinical tests also rise, but the pressure to cut back in response to those scores decreases. Income tends to mask the clinical signs of distress and, thus, efforts to curtail gambling are likely to lag behind the level of gambling involvement." Chapter 6, p. 49.

20. "Thus, the predictive power of the diagnostic test is 100% if the respondent scores three or more and it is only

50% if the respondent scores less than three." Chapter 6, page 51.

21. There are "47 cases, or 5.86% of the sample who are potentially pathological gamblers." Chapter 6, page 52. "The total (of those scoring on just 2 of the clinical signs tests), 27 cases, or 3.37% of the sample, can be subtracted from the refined "at-risk" pool, leaving 20 cases of probable pathological gamblers. Of these, 12 cases, or 1.498% of the sample can be subtracted from the probable pathological gamblers group because they did not pass the diagnostic test. The remainder, 8 cases, or .998% of the sample, represents the diagnosable cases detected in this survey." Chapter 6, page 52-53.

22. "Only by collapsing the potential/probable sub-classifications does the ISR model predict the number of diagnosable cases in the population. However, it also suggests that the ISR test understates the probable magnitude of the prevalence rate by 55% to 80%." Chapter 6, page 54.

23. "In conclusion, then, TPA recommends that, for purposes of estimating the current prevalence rate of pathological gamblers in the state of Ohio, the predictions based upon the cumulative clinical signs test be adopted. Given a

total adult population in Ohio of 7,703,310 persons, TPA predicts that there are probably 192,227 pathological gamblers. Additionally, there are another 259,601 gamblers who demonstrate the potential for either being pathological gamblers at present, or becoming pathological gamblers in the future. Chapter 7, p. 57.

Introduction

Pathological gambling is described by the National Council on Compulsive Gambling as a progressive preoccupation and urge to gamble. The cardinal features are emotional dependence on gambling, loss of control, and interference with normal functioning. Pathological gambling is classified as a disorder of impulse control in Section 312.31 of the Diagnostic and Statistical Manual of Mental Disorders - Third Edition (1979) of the APA. As such, it is akin to alcoholism and afflicts the individual with similar patterns of behavior which "compromise, disrupt, or damage personal, family, or occupational pursuits." (DSM III) Beyond the damages incurred by the victim of this disease, there are costs to others. These include: defaulted loans, income tax evasion, lost work time, prison costs, and the costs of providing support to injured families. At this time, there are no data which fully describe the impacts of these costs on the local economy.

Typically, there is little known about the prevalence of pathological gambling in the population. Afflicted individuals are reluctant to recognize their own needs for treatment. They carefully hide the traces of compulsion. As the disease progresses they may become desperate, and engage in non-violent forms of criminal behavior, such as check forgery or illegal borrowing. Frequently, a personal crisis of dramatic proportions brings an individual to the community mental health center for assistance.¹ Clearly, the number of those who eventually "bottom out" is an insufficient measurement of the potential need for such help. A more sophisticated calculation is required which employs modern statistical techniques to elicit the number of those who may be gambling pathologically.

When the typical client appears for treatment he/she has between \$15,000 and \$80,000 in gambling debts, earns between \$15,000 and \$100,000 a year, is in the throws of job instability, family disruption, and possibly court proceedings surrounding illegal attempts to acquire money for gambling. The creditors range from banks, finance companies, and business associates to family, friends, organized crime, and the casinos themselves. Stable credit such as mortgage and car payments are interrupted. Hospitalization and disability insurance are lost.

The employer is a principal victim. He/she suffers loss of employee time, and efficiency. Frequently, as the employee's judgement is increasingly impaired, the employer becomes the victim of gambling related company crimes, such as embezzlement, and other forms of fraud. Some leaders in the insurance industry recently estimated that the majority of such company crimes are related to gambling activity and result in losses of more than \$40 billion annually in the United States. The pathological gambling syndrome destroys the financial and emotional integrity of the compulsive individual. It impacts upon the lives and financial integrity of family, friends, employers, associates, and ultimately upon social institutions such as courts, law enforcement agencies, family welfare agencies.

In 1978, at the Fourth Annual Conference on Gambling, in Reno, Nevada, Dr. Robert Custer, M.D. presented a report which for the first time offered a statistical profile of the pathological gambler. Dr. Custer is the Chief of the Treatment Services Division, in the Mental Health and Behavioral Sciences Division of the Veterans Administration. He had administered a questionnaire the previous year to 150 pathological gamblers attending an international conference of Gamblers Anonymous held in Chicago, Illinois. While the respondents were not representative of the membership of

gamblers anonymous as a whole, and while they were a particularly successful group of recovering compulsive gamblers, they also came from many parts of the United States and Canada, and were highly motivated individuals, and therefore, highly likely to be honest in their responses.

Custer's survey focused on the history of the gambling pathology, and the personality traits which predominated in this group. His purpose was to derive some baseline data with which to compare new data sets as they might emerge from subsequent investigations.

Custer was able to construct a profile of the typical pathological gambler. According to Custer, the afflicted person would most likely be a male (although females were under-represented at the conference), reaching middle age, Roman Catholic (followed by Protestants), who is married, a high school graduate, of Irish descent (followed by Jewish, Italian, and German descent), employed, with a background of military service. He would be of superior intelligence, vigorously competitive, industrious, energetic, athletic, with good school performance. He is likely to be a "work-a-holic," who is attracted to stimulating challenges and who, correspondingly, avoids boredom. Thus, tasks which are dull are left incomplete. In summary, the pathological gambler

commonly presents what are called premorbid personality traits.

Dr. Custer found that the pathological gambler is 14 when he places his first money bet. He is 17 when he first wins or loses \$20 or more. This factor of early exposure is clearly significant. Over 95% of those responding said that they had begun to gamble before the age of 21. At some time during this early period, the individual experiences a big win. The average age when a respondent sought help and joined gamblers anonymous was 39. As many as 40% waited 6 months or more to join gamblers anonymous after they had first heard about it; and 40% sought the assistance of a mental health professional before going to gamblers anonymous. Almost all reported that they had experienced chronic, severe stress by the time they sought help.

An average respondent did not have a history of anti-social characteristics as a child or an adolescent. Ninety-eight percent (98%) denied any addiction to drugs. Ninety-eight percent (98%) denied alcoholism. Similarly, 96% denied that either parent had a serious psychiatric illness; 86% denied that either parent had been a compulsive gambler; 82% denied that either parent had ever been an alcoholic.

Ninety-six percent denied that they had had a close relative who had committed suicide. However, 98% said that when they were actively gambling, the opportunity to do so was within one hour's drive; 100% said that gambling was currently available within one hour's drive. Sixty percent said that they preferred casino gambling over other forms of gambling.

The social consequences of the pathology for the individual were severe, according to the Custer survey. Ninety-eight percent reported serious distress in the family. Sixty percent had lost one or more jobs or business opportunities. Seventy percent said that they had failed to meet their basic needs; and 66% said that they had defaulted on debts. Ninety percent had had a financial bailout. Almost one-fifth had attempted suicide. Ironically, 75% admitted to having bragged about winning while they were losing.

Research on the incidence of pathological gambling has been limited. Gamblers Anonymous has estimated that 6% of the population is afflicted and the National Council on Compulsive Gambling estimates 10%. Although there has been much speculation of this type, there has been only one previous empirical investigation on the subject. In 1975, the Institute for Survey Research of the University of Michigan conducted a national survey of American gambling

attitudes on behalf of the United States Commission on a National Policy Towards Gambling. The ISR researchers found that 61% of all Americans gambled in 1974. However, an important regional variation was identified. This figure increased to 78% in Nevada.² From this finding, the authors assumed that since the number of people who gamble was significantly greater in Nevada, participation rates varied with the number of legal facilities.

A significant regional difference also was found when the ISR researchers examined the relationship between the incidence of compulsive gambling and the availability of legalized gambling. In Nevada, the percentage of compulsive gamblers was 271% higher than the national percentage. Based on their findings, the ISR researchers concluded that a marked increase in the incidence of compulsive gambling would probably follow legalization of new forms of gambling in other parts of the United States. Furthermore, it is important to realize that any estimate of the incidence of compulsive gambling is an underestimation of the number of people needing treatment because the family members of the afflicted individual are also likely to need treatment.

The 1976 ISR report published two sets of conclusions about the prevalence of pathological gambling: one set for the nation as a whole, and one set for the state of Nevada.

Each set was based upon a unique probability sample drawn in the summer of 1975. At the national level, ISR reported that .77% of the United States adult population (18 years of age or older) were probably pathological gamblers. An additional 2.33% of the adult population were potential pathological gamblers. In the state of Nevada, the figures for probable and potential pathological gamblers were 2.62% and 2.35% respectively.³

Chapter One: The Methodology

What method did the ISR research team employ in order to isolate the results? Essentially, the ISR team based its conclusions upon estimates derived from 18 variables which functioned as a test for the distribution of the personality characteristics of a pathological gambler. Each of these 18 variables had been pre-tested with pilot samples of known

pathological gamblers and of church-goers (which served as a model group of non-pathological gamblers). In the pre-test stage, these 18 variables had successfully discriminated between pathological gamblers and church-goers with 90% to 95% reliability in repeated blind tests.⁴

What exactly did they mean by "probable" and "potential" pathological gamblers? The 18 discriminant variables identified a pool of gamblers most "at-risk" of gambling pathology. The probability-of-inclusion level for the "at-risk" pool was set at .96 in order to guard against false positive classifications. According to the authors, Kallick et alia, "in spite of these precautions, however, the safest assumption was that the initial estimate of

possible compulsive gamblers is an overestimate."⁵ The "initial estimate" refers to the "at-risk" pool. No explanation of this assessment was offered. Yet it precipitated a subjective inspection of the at-risk cases by the research team itself. In the end 44% of the at-risk group showed no signs of heavy gambling nor of any other problems. Once again, the researchers noted, "Even though the estimated incidence of compulsive gambling was adjusted for errors in prediction, it is possible that the figure is low due to concealment."⁶ In these ways, the authors expressed their own misgivings about the accuracy and reliability of their discriminance test.

In 1981, Nadler and Mellonics challenged the validity of the 18 ISR variables. In a paper presented to the Fifth National Conference on Gambling and Risk Taking, held at Lake Tahoe, Nevada, in 1982, Nadler demonstrated that the discrepancy between the item scores of the control group of known pathological gamblers and the designated groups of probable and potential pathological gamblers ranged from 16% on most items to 74% on at least one item.⁷ Intuitively, one might expect that general personality trait

questions or self-assessments like, "I sometimes vote for candidates about whom I know very little, true or false,?" would offer little help in a count of pathological gamblers.

In 1979, a clinical definition of gambling pathology was adopted by the A.P.A. and included in its Diagnostic Statistical Manual:III. Discriminant variables have been developed since then by Gamblers Anonymous, by Custer (1978) and by Meeland (1982), which reflect this technical knowledge. A question such as, "Sometimes, when I have been gambling and losing, afterwards I feel a sense of remorse, true or false,?" addresses gambling pathology directly. The validity of such a question is manifest.

Yet, the problem of the honesty of the respondent is thought to seriously undermine any attempt to query more directly into gambling involvement. Hence, there is a dilemma between sensitivity and specificity in the choice of a discriminance test. The ISR variables, however lacking in clinical specificity, are innocuous, that is, they do not invite evasive behavior. A direct comparison of the two approaches seemed warranted in order to determine the

accuracy of each test, in particular, when applied over the telephone.

Additionally, the symptoms of gambling pathology are evidenced in behavior. The ISR team accounted for gambling behavior only in its subjective inspection of the at-risk pool. Transition Planning Associates determined to incorporate a measurement of the frequency of play and dollar amount spent gambling directly into the statistical framework. The discriminance tests would be cross-tabulated with gambling behavior. Furthermore, both chronicity and progressivity of gambling behavior would have to be directly observed. Hence, the behavioral data (section four) was collected for two years, 1981 and 1984. The factors chronicity and progressivity serve as the necessary conditions of "risk." They function as filters, therefore, which immediately refine the reliability of the discriminance tests.

Transition Planning Associates developed a questionnaire which replicated the 1975 I.S.R. test, and which drew upon the basic research efforts of Dr. Robert Custer and his associates, Drs. Tor Meeland and Samuel

Krug.³ A diagram of the questionnaire is presented in Appendix B. The questions begin with the most innocuous variables and gradually open the discussion of gambling experiences. Section One queries the respondent's participation in several leisure time pursuits, including games of chance. All of the demographic information, excluding income, is collected here. Section Two profiles the respondent with pre-tested discriminant variables (from both the ISR and IGB sets) which do not mention gambling, and which are not thought to be "sensitive." Section Three further profiles gamblers with discriminant variables which do mention gambling but which are not the hard diagnostic criteria. For non-gamblers living in households of 2 or more persons, there is a version of section three which solicits information about the gambling activities of other household members. Section Four takes a detailed look at participation in gambling and collects the income data. Section Five applies the diagnostic criteria.

The methodology called for the identification of two "at-risk" pools by means of the ISR variables (18) and the IGB variables (29) respectively. Each pool would be further

evaluted by two methods: 1) the subjective designations method originally employed by the ISR researchers (24% of the national risk pool and 35% of the Nevada risk pool were designated as potential and probable pathological gamblers by personal inspection of the investigator in 1975); 2) the diagnostic test (Section V of the questionnaire). The results would be cross-classified in a 2-way table and a check would be made for misclassification. The most reliable rate would be identified.

The comparison of the ISR and the IGB discriminance tests is the primary task of this report. The methodology for doing this has been established in a previous report by TPA to People Acting to Help, Inc. (PATH). The procedure developed in the PATH report will be applied to the Ohio survey data in subsequent chapters. First, however, the Ohio sample will be described.

Chapter Two: A Profile of the Sample

The Ohio sample consisted of 801 respondents, all of whom were 18 years of age, or older.

Of these, 47.0%, or 376 persons, were males and 52.7%, or 422 persons, were females.

There were 511 married respondents (63.8%) and 140 single persons (17.5%), while 146 (18.3%) were either separated, divorced, or widowed.

Fully 76.4%, or a total of 613 persons, had graduated high school, attended college, or graduated college. Slightly more than 16%, or 129 persons, had not graduated from high school, but only 6.7%, or 54 persons, went beyond college to attend or complete graduate school.

In terms of ethnicity, or race, 729 persons identified themselves as white (91%), while only 61 persons (7.7%) identified themselves as black. Only 5 persons (.6%) classified themselves as "other." (The same number refused to answer this question, that is, .6%)

Among the respondents, the leading age category was 18-34, with 36.7%, or 294 persons. Next came those 35-49 years of age, with 27.4%, or 219 persons. Next came those 50-64 years old, with 20.7% (166 persons), and finally came the senior citizens, 65 years of age or older, with 14.7% of the respondents, or 118 persons.

The clear majority of the sample, 61.4% or 492 persons, were protestants. About 26% were Catholics (210 persons), 1.2% were Jewish, 2.6% were "other" and 6% expressed no religious preference.

A majority of the respondents, 52.4%, or 415 persons, were employed full time. Another 10.9%, or 88 persons, were employed on a part time basis. Housewives (14.3%, or 114 persons) and retired persons (15.1%, or 121 respondents) were roughly even. The unemployment rate among the respondents was 4.7%, or 38 persons.

Fully 194 of those surveyed described themselves as frequent or occasional gamblers, for a rate of participation in games of chance of 24.2%.

The Michigan survey of 1975 set the rate of gambling participation in the nation at 61%. Thus, there is an apparent discrepancy of nearly 36.8% between these two rates. Perhaps, the 1985 Ohio rate represents the number of respondents who both perceived themselves as gamblers and were willing to disclose this to a stranger over the telephone. The more likely answer to this question can be found by examining the questions used to identify gamblers in each survey. For instance, the ISR researchers asked respondents if they placed a bet of any kind in 1974. The Ohio survey in 1984 asked respondents if they frequently, sometimes, or never participate in games of chance or bet on the outcomes of games, events, or drawings.

Which question more accurately characterizes participation? Perhaps, there were many of the ISR bettors who happened to have bought a raffle ticket in 1974, but otherwise never gambled. Should such "one-time-only" cases have been included in the pool of gamblers? Given the primary task of the ISR researchers, which was to document the extent to which Americans participate in both legal and illegal forms of gambling, the answer is most certainly "yes." The question employed by the 1984 Ohio survey asks people to identify themselves as frequent or occasional gamblers. While the opportunity for denial is ever present - using either question - this latter question implies recurrent or continuous gambling behavior, rather than an isolated instance. It is, therefore, more appropriate to the principal task of this survey, which is to isolate pathological gamblers.

Chapter Three. Gambling Behavior

Of the 12 games of chance described in Section 4 of the questionnaire, 6 of them showed an increase in the relative number of respondents who played them between 1981 and 1984 (see starred items, Table 1). Yet only two of these games, state-sponsored lotteries and office pools, ranked among the top 5 games in terms of frequency of play in either year. Conversely, three of the top 5 games declined in frequency of play.

Table 1 provides three levels of information. Looking at the first two columns, the table displays the raw frequencies of play, the relative frequency of play, and the ranking of the top 5 (most recently played) games. Behavior is then compared with stated preferences in column three. In 1981, lotteries and games at home with family or friends, like cards, were approximately tied for first place. But over the next four years, the lotteries moved clearly into first place with a 95% increase in participation. Home-based gambling, on the other hand, declined by 6%. In terms of stated preferences, however, Ohio residents rated home-based gambling their favorite form. Horses and office pools were approximately tied for third place in 1981. By 1984, however, horse racing declined by 17.8% into 4th place. Office pools showed a slight increase of 5.5% and ranked

third. In terms of popularity, however, the horses ranked in third place, while office pools ranked fifth. Sports betting held steady in terms of participation between 1981 and 1984, occupying fifth place in both years. But in terms of popularity, sports betting did not rank in the top five. Instead, bingo was the fifth most popular gambling activity. Notably absent from any of the rankings are casino games, either in Atlantic City/Las Vegas, or charities in Ohio.

Of the 185 Ohio gamblers reporting, 36, or slightly less than 20% indicated that they had won overall in 1984. Another 78, or 42%, lost money overall in 1984. Finally, 71 gamblers, or 38%, indicated that they broke even overall in 1984.

In total, 151 gamblers, or 78% of all gamblers, placed a wager in both 1981 and 1984. These can be called chronic gamblers. Among chronic gamblers, there were 88, or 58.27%, who increased their total annual wagers over time. This compares with 16 gamblers, or 11% of the chronic gamblers, who reported that they intended to spend more on gambling in 1985. There were 39 gamblers, or 26.1%, who reduced their total annual wagers between 1981 and 1984. This compares with 36 gamblers, or 23.84% of the chronic gamblers, who reported that they intended to spend less in 1985. There were only 24 gamblers, or 15.7%, who actually held steady in their total annual wagers between 1981 and

1984. This compares with 98 gamblers, or 65% of the chronic gamblers, who reported that they intended to hold steady in their gambling behavior in 1985.

Proceeding further, if all those who intend to spend more on gambling in 1985 (16 cases) are subtracted from those 88 who actually increased their wagers between 1981 and 1984, the remainder, 72 cases, or 81.81% of the progressive gamblers, represents a conservative estimate of those whose observed betting behavior between 1981 and 1984 conflicts with their expressed intention to cutback or hold steady in 1985. These are gamblers who want to reduce their gambling behavior despite a history of progressive involvement.

In conclusion, then, with regard to the evidence of gamblers' conscious control over their involvement with games of chance, it appears that, in general, what gamblers intend to do is out of step with what they actually do. Their determination to consciously decide on a steady level of expenditure on gambling is not corroborated by the evidence that gamblers are more than 5 times as likely to either increase or decrease their total annual wagers as they are to hold steady in their gambling behavior over time.⁹ The odds in favor of increasing rather than decreasing one's gambling expenditures are 2.25 to 1. Among

those who increase their gambling expenditures, 81.81% express a desire to cutback or hold steady in 1985.

The next three chapters of this report will address both the problem of how to distinguish a gambler who is pathological from one who is not and the related problem of how to accurately count the number of such gamblers in the population. Already, however, we can see that an incongruity between intention and behavior burdens the lives of a considerable number of ordinary gamblers.

Chapter Four. The Discriminance Tests

The first task in the process of counting the number of pathological gamblers in the population at any given time is to distinguish these individuals from all other individuals in a sample of the population. Discrimination presents several problems. With a syndrome like gambling pathology, there is evidence that afflicted individuals deny the condition. This behavior makes direct inquiry difficult. Indirect inquiry would be an attractive alternative were it feasible. Two indirect and one direct approach to discriminance were employed in this survey: the 18 variables I.S.R. test (indirect), the household informant test (indirect), and the 29 variable IGB test (direct).

In order to construct a discriminance test, variables must be identified which reliably sort a sample into those at risk of gambling pathology and those who are not at risk. Historically, the ISR test established a precedent in this field of research. It was developed by researchers who were themselves neither psychologists nor mental health clinicians of any sort. Nor were they charged primarily with the task of estimating the number of pathological gamblers. Their method for selecting the test variables is amply described in Chapter 12.1 of the "Survey of American Gambling Attitudes and Behaviors." 10

"On the basis of the literature review and search for conceptual measures which met at least minimal standards of reliability and validity, 119 items were selected for inclusion in a preliminary 'Compulsive Gambling Scale,' which was later reduced to a smaller subset of items serving as the best predictors." ¹¹

The 119 items were selected from existing psychological scales. These scales tested for the characteristics of personality which were thought to predispose an individual to compulsive gambling. A pilot study was performed on 274 gamblers and 239 church members. Furthermore,...

"A multiple discriminant analysis of the 119 items was run, using as a data base a randomly selected portion of the sample, composed of 120 compulsive gamblers and 120 church members. It yielded 18 items which discriminated between the two known groups, correctly classifying 95 percent of the church members and 90 percent of the compulsive gamblers. When the multiple discriminant function was applied to the remaining 154 compulsive gamblers and 119 church members in cross-validation, the correct classification rate was again 95% for the church members and 90% for the compulsive gamblers." ¹²

Applying the 18 variables to a random sample of the United States population Kallick (et.al,) set the probability of inclusion level quite high for pathological gamblers (.96).¹³ Presumably, any individual's discriminant function which fell beyond the .96 cutoff point would have four chances in 100 of not being a pathological gambler. More simply put, the I.S.R. researchers were 95% confident that such a case would be a pathological gambler.

Replication of the I.S.R. test would require knowing what discriminant weight was associated with each variable. Unfortunately, these weights are not available from I.S.R. Furthermore, these weights could not be reproduced without access to the original model group data sets. These were also unobtainable after ten years. Consequently, the discriminant coefficients were assigned the value of 1. Working from the published data,¹⁴ scores on each item were generated for the pathological gamblers group and the churchgoers group. The mean scores are presented in table 12. Column 3 of table 12 presents the grand means for each variable. The totals of columns 1 and 2, when summed and divided by 2, equal the grand total of column 3: 34.10325. The grand total was defined as the symmetrical cutoff point in a discriminance test.¹⁵ Table 12 also displays the basic functioning of the ISR test. The scores on the 18 variables are summed for each case and compared with the symmetrical cutoff. Lower scores fall into the group "at-risk" of gambling pathology.

When properly designed, the process of discrimination not only sorts individuals into two groups, but also associates each group with its respective model group, the principal characteristics of which the test group is supposed to share. Such a procedure is critically important if the discriminant variables are innocuous with regard to the characteristics one is trying to detect. The I.S.R.

variables may be innocuous and sufficiently discriminatory but are they associative? Ideally, a valid discriminance test for pathological gamblers would yield one group of individuals whose test scores are most similar to those of known pathological gamblers and who evidence the clinical signs of the syndrome, on the one hand, and a second group of individuals whose test scores are most dissimilar to those of pathological gamblers and who evidence few, if any, clinical signs of the syndrome, on the other hand.

In the absence of the discriminant weights, it was thought necessary to check the performance of the test variables in some manner which would account for discriminance and association. First of all, an initial test was run using the symmetrical cutoff point. A t-test for the difference of the group means was run. Next each variable was examined individually. A chi-square test was run to see if the risk classifications were statistically associated with the distribution of the variable scores. The significance level was set at the .05 level in order to guard against a type 1 error, or a false positive misclassification. Next, a chi-square test was run on the model group/test group pairs in order to see if inclusion in either group was statistically associated with the distribution of the variable scores. The significance level was set at the .1 level in order to guard against a type 2 error, or a false negative misclassification.

The entire process was then repeated four times at four additional a-symmetrical cutoff points. A table of discriminance and a table of association was then prepared, as well as a table summarizing the behavior of each of the eighteen variables. Finally, a cutoff point was selected which maximized discriminance and association. Variables not contributing to either function were dropped. The remaining variables were then regrouped, and the discriminance test was re-run producing the final differentiation of "at-risk" and "not-at-risk" cases. A second t-test was run to examine the difference of means.

Tables 3, 4 and 5 display the discriminance, association, and summary of these functions for the 18 ISR variables at 5 cutoff points: .5, .25, .2, .1, .04. Each cutoff point represents a probability-of-inclusion level with a corresponding confidence level (1 minus the probability-of-inclusion). Different combinations of discriminance and association are available at each of these levels. The uneven performance of the 18 variables can be attributed to disturbance from population variance at the scale of the individual variables (cf #Note 15). On table 3, the table of discriminance, a 1 signals that a discriminance has occurred. The "1's" are totaled at the bottom of the table and to the right of the rows. On table 4, the table of association, 1 also signals that a discrimination has occurred. But the zero's signal an

association, and these are totaled at the bottom of the table and to the right of the rows. From table 5, the summary table, it is evident that the .2 cutoff point maximizes both discriminance and association. Only nine variables actually contribute to the test at this probability-of-inclusion level, and thus nine are designated to be dropped. Note that the .25 cutoff point with its higher number of discriminations was not selected because of its low number of associations. Lower probability-of-inclusion levels result in unacceptably low levels of discrimination.

The remaining variables were re-grouped into a more efficient discriminance test with a probability-of-inclusion level of .2. The gamblers were re-tested. The discriminance yielded a group of 21 gamblers in the "at-risk" pool and 172 gamblers in the "not-at-risk" pool. A difference-of-means test showed that, after controlling for the internal group variances, the between group variance was significant below the .0001 level. This statistic indicates that there is near certainty that the two groups are composed of individuals drawn from distinctly different populations, presumably pathological gamblers and non-pathological gamblers.

Chapter Five. Predictions Based Upon the I.S.R. Model

In this chapter, the model of the 1975 I.S.R. prevalence rate will be applied to the 1985 survey of Ohio. On the basis of this model, the 1985 prevalence rate for pathological gamblers will be estimated and then evaluated. The principal tasks are: 1) to display the original 1975 ISR model based upon the national sample; 2) to exclude non-gamblers from the "at-risk" pool; 3) to adjust the rates obtained from inspection in order to reflect the more exclusive "at-risk" pool; 4) to apply the adjusted rates to the 1985 Ohio sample; 5) to evaluate the results in the light of reasonable expectations; 6) to substitute the subjective inspection of the "at-risk" pool with the diagnostic test; 7) to re-evaluate the results.

The original 1975 ISR model of the national prevalence rate of pathological gambling is displayed in table 6. The statistical portion of the model extends only to the identification of the "at-risk" pool. The further differentiation of five sub-categories of respondents in the "at-risk" pool was accomplished by means of subjective inspection by the ISR research team. That is, they read the questionnaires and sorted out those cases which appeared to them to meet the criteria for the designation of a pathological gambler. It is important to note that the ISR

investigators were not themselves clinicians. Yet they performed a diagnostic role in the design of this discriminance procedure.

It is also important to remember that the ISR discriminance test was applied to gamblers and non-gamblers alike. In the 1985 Ohio replication of the test, non-gamblers were separated from gamblers. Consequently, in 1975, the "at-risk" pool contained many cases which, upon inspection, showed either no signs of gambling-related pathology, or no signs of gambling involvement at all. The former group is referred to as "other pathology" or "poor comprehension, illiterate." The latter are referred to as simply "others." It is this latter group which "managed to conceal any evidence of their gambling from the interviewers."¹⁶ Consequently, it is this group of non-gamblers which will be excluded from the calculation of the "at-risk" pool. The pool will be reduced by 44%, from 278 to 156 cases. The number of cases in each of the remaining sub-groups will be held constant. That is, the relative proportions will be allowed to change as the size of the pool is reduced. Also, sub-groups C and D will be collapsed into one category "C." The adjustments to the model are displayed in table 7.

As previously discussed, the ISR questionnaire asked respondents if they had placed a bet at any time in the

previous calendar year (i.e., 1974). On the basis of this indicator, the researchers concluded that 61% of the American public were gamblers. In table 7, 39% of the sample is excluded from the model on the grounds that they were not gamblers. The number of cases "at-risk" in subcategory E of table 6 is subtracted from the original "at-risk" pool. That is, 278 cases "at-risk" minus 122 cases designated "other" equals 156, or the number of cases remaining in the "at-risk" pool in table 7. These cases represent 14.73% of the total number of gamblers identified by ISR in 1975. The number of probable pathological gamblers has been held constant between table 6 and 7, as have the numbers in the remaining categories. The number of cases in the category A is 16% of the total number of cases in the "at-risk" pool, (or 156 cases). The same follows for categories B and C.

Having adjusted the ISR model in order to remove unwanted cases of non-gamblers, it is now possible to utilize the model to project what one would expect to find in Ohio in 1985 if there had been no appreciable change in the prevalence rate. The expected frequencies are obtained by holding the proportion of "at-risk" gamblers to total gamblers constant. The key ratio is 14.73%. As displayed in table 8, out of a total sample of 801 cases, there were 194 which identified themselves as frequent or occasional gamblers. Of these, the ISR model projects 29 cases in the

"at-risk" pool. In table 8, the ratios of the sub-classifications are held constant, yielding for instance, 4.64 cases out of 29 which could be classified as probable pathological gamblers. The same procedure is followed for the remaining categories.

In table 9, the ISR model is applied directly to the observed cases in the "at-risk" pool. Only 10.82%, or 21 cases, actually fell into the "at-risk" pool in the state of Ohio in 1985. Holding the ratios of sub-classification constant once again, the model projects that, of the 21 cases in the "at-risk" pool, 3.36 cases could be designated as probable pathological gamblers. The same procedure follows for the remaining categories.

Overall, how do the scores based upon the observed "at-risk" rate compare with those based upon the expected "at-risk" rate projected from the 1975 national model? Table 10 displays the expected and the observed scores together, as well as the difference between the observed and the expected "at-risk" pools (O-E). The percent change $(O-E/E)$ is also presented. There would appear to have been a decrease in the "at-risk" rate of 28% in Ohio in the last ten years. The same calculations are presented for the observed and expected sub-classifications. Again, there would seem to have been a 28% decrease in each of the sub-classifications. One of the limitations of the ISR model is evident here: namely, that the changes apparent in the sub-classifications

the sub-classifications are simply a function of the change in the "at-risk" rate. The application of the 1975 sub-classification rates does not afford any detection of possible changes in concentration of pathological gamblers within the "at-risk" group.

In order to overcome this rigidity in the ISR model, and in order to evaluate the validity of the subjective inspection portion of the ISR discriminance procedure, TPA developed an objective test for gambling pathology based upon diagnostic criteria described by Dr. Robert Custer. The results of the diagnostic test are presented in Table 11. The percentage of the "at-risk" pools represented by each of the sub-classifications are also presented in Table 11, as is a comparison between the expected and the observed scores. The main difference to be noted is that the 1985 survey diagnosed 8 bonafide cases of gambling pathology, whereas the ISR model would have predicted only 4.64 cases. The difference is 72.41% despite a -18% difference in the respective sizes of the "at-risk" pool. This striking discrepancy between the observed and the expected scores when more clinical test variables are used to identify the target group suggests that the subjective inspection portion of the ISR discriminance procedure seriously undercounted the prevalence rate of pathological gambling in the state of Ohio. In fact, when the subjective portion of the ISR procedure is replaced with the diagnostic test, the rate of

probable pathological gambling, .998%, exceeds the rate, .77%, proposed by ISR in 1976 by .228%.¹⁷

The further differentiation of sub-classifications within the 1985 "at-risk" pool could not be executed by simply applying the ratios originally derived from the subjective inspection of the 1975 "at-risk" pool. Therefore the entire "at-risk" pool must be interpreted at face value: namely, as the group of gamblers who are "at-risk" of gambling pathology. There are 21 such cases in the Ohio sample, or 2.62%. By means of a separate, more specifically diagnostic test administered to all 194 gamblers, 8 cases of gambling pathology were diagnosed. This represents .998% of the entire sample.

In conclusion, although the subjective inspection of the at-risk pool had been replaced by the diagnostic test, the overall impression derived from a comparison of the 1975 and the 1985 results is that there may have been an increase in the observable prevalence rate of pathological gambling in the state of Ohio of 29.61%, among those evidencing the "hard" signs of pathology.¹⁸

Finally, the use of clinical variables which directly probe for the signs of gambling pathology is both desirable because of their greater specificity and feasible because of the apparent willingness of many gamblers to answer such questions honestly over the telephone. It is the analysis

of an additional battery of clinical variables, called the "soft signs" of gambling pathology, to which we now turn.

Chapter Six. Evaluating the I.S.R. Model.

Part 1. The Distribution of Clinical Signs

In order to evaluate the findings in chapter five, an alternative means must be found for performing the same task of discrimination. The options include changing the sample from gamblers themselves to their families, or changing the approach from innocuous to more conspicuous discriminant variables. The latter option is the subject of this chapter.

The I.S.R. test employs questions which are not directly descriptive of gambling pathology. The test may isolate a group of respondents who answer the question in a distinctly similar manner to a group of known pathological gamblers, but do these respondents evidence any clinical signs of gambling pathology themselves? Additionally, if one were to examine those gamblers who were excluded from the "at-risk" pool under the I.S.R. model, how many of them would also show the clinical signs of gambling pathology? Theoretically, the answer ought to be zero. If it were not, how effective would the I.S.R. test be? If the more direct approach predicted a different prevalence rate, on what grounds would the accuracy of the two estimates be decided? Is there a necessary trade-off between sensitivity and specificity, or can a more direct approach complement the indirect approach of I.S.R.? To answer these questions a

new discriminance test was incorporated into the Ohio survey instrument.

Since 1975, the knowledge base about pathological gambling has expanded rapidly under the leadership of Dr. Robert Custer and through the efforts of the research team at the National Foundation for the Study and Treatment of Pathological Gambling in Washington, D.C. TPA designed a discriminance test which draws upon this base of clinical knowledge about the pathological gambler. Twenty-seven variables, taken from the Inventory of Gambling Behavior, and representing the soft signs of gambling pathology were employed in part II and III of the questionnaire to identify a new "at-risk" pool. Eight variables representing the diagnostic, or hard signs of the gambling pathology were employed in part V of the questionnaire to identify clinical cases of pathology among those in the "at-risk" pool.¹⁹

In addition to the hard signs test, four soft signs tests were constructed by grouping three or four of the soft signs variables around common themes²⁰ referring to the negative impacts of gambling. The themes were: personal, interpersonal, vocational, and financial. Each grouping became one test in a five-part cumulative clinical signs test. Table 12 presents the list of the I.G.B. variables, grouped by theme, with the chi-square discriminance scores taken from the pretest between pathological and non-pathological gamblers, and also the

relative frequency with which a respondent would answer in the affirmative to each individual question.

The relative frequencies within each group were combined, summed, and averaged for each test (for instance, $(58.45\% \text{ plus } 7.75\% = 66.21)$, etc.). The mean of the combined relative frequencies in each test was identified as the average probability of any individual answering in the affirmative on that test. The mean of the relative frequencies per group per test (i.e., uncombined) yields the average probability that any individual from one group would answer in the affirmative on any of these tests. Table 13 presents all of this information in columns 1, 3, and 5. Columns 2, 4, and 6 show the cumulative probabilities, that is, the maximum probability associated with an affirmative answer on each successive test given an affirmative on all of the previous tests. The seventh column presents the odds in favor of the respondent who gives an affirmative answer on each successive test being a pathological gambler rather than a casual or social gambler. One could say, for instance, that there is, at least, a 13 to 1 chance that a respondent who scores on any one of the 5 tests is a pathological gambler.²¹

Looking at table 13, a probability of inclusion level can be identified which functions in a parallel manner to the cutoff point in a typical discriminant function analysis. The table shows that the total cumulative

probability (col. 2) of answering in the affirmative on at least 3 of the 5 tests is slightly less than .2. The corresponding confidence level is 80%. Note that the cumulative probability of a pathological gambler (col. 4) scoring on three of the five tests is .15. The corresponding confidence level is 85% (slightly higher than the total) and the odds in favor of such a respondent being a pathological gambler are better than 45,000 to 1. Since pathological gambling is such a rare event in the population, it seems unnecessary to reduce the probability-of-inclusion level below .2. For example, if one were to postulate 90,000 pathological gamblers at the .2 probability-of-inclusion level using the clinical signs tests, then the odds are that the investigator would misclassify a gambler only twice. At the .35 level, there would be 569 errors.

Table 14 displays the cumulative clinical signs test scores for the 194 gamblers in the 1985 Ohio sample. Nearly three times as many gamblers scored on at least one test as did not score at all. This, in itself, is a notable finding because the impression given by the ISR test is that only a small portion (2.62%) of all gamblers run any risk of gambling pathology. On the basis of the clinical signs test, and despite the expectation of denial from gamblers when asked to discuss their gambling problems directly, the opposite impression is derived: namely, that 73.7% of those

who identified themselves as gamblers in 1985 in Ohio also admit to one or more of the clinical signs of gambling pathology and, therefore, are "at risk."

The second major finding from table 14 is that 24 of the 194 gamblers (12.37%) admit to 3 or more of the clinical signs. According to table 13, the odds that these 24 are pathological gamblers are 45,000 to 1 or more. Thus, there may be three times as many probable pathological gamblers as were detected by means of the diagnostic (hard signs) test alone. In particular, the 13 cases scoring on four and five of the clinical tests are most strongly identified as cases of gambling pathology because the odds in favor of this being so are better than 302,000 to 1. This is still 62.5% more pathological gamblers than were detected by means of the diagnostic signs test²². Including all those who scored on three or more tests, the probable prevalence rate of pathological gambling in Ohio would be 24/801, or 2.99%. In comparison with the probable and potential pathological gamblers (9.03 combined) identified by means of the ISR test (see observed scores, table 10), there would be nearly three times as many more pathological gamblers in Ohio than the ISR test detected.

One of the strengths of the clinical signs model displayed in table 14 is that it specifies the distribution of clinical signs of gambling pathology throughout the population. The number of persons experiencing some

negative side effects from their involvement with gambling appears to be significantly greater than the likely number of diagnosable cases of pathology. From table 14, the number of cases showing one or two clinically treatable ill effects of gambling is clearly visible: 119 cases, or 61% of all gamblers in the sample. For purposes of estimating the need for outpatient treatment services, however, it may be preferable to include only those with scores on at least two tests in a "potential pathological gambler" category. Presumably, everyone risks some harm when they gamble. One might even experience damage along one or another of the five clinical dimensions. But when a gambler experiences multiple wounds and keeps gambling, then that gambler may be unable to restrain his/her involvement, (the odds in favor are better than 100 to 1) or at least might seek assistance in trying to do so. Thus, TPA would expect that there is an additional 4.86% of the sample which might seek outpatient treatment services for gambling related injuries.

Part II: Chronicity and Progressivity of Gambling Behavior

By definition, pathological gambling is a chronic and progressive pre-occupation and urge to gamble. It is important, therefore, in any estimate of the prevalence of pathological gambling, to control for these two factors. They are the necessary, but not sufficient, criteria for the diagnosis of gambling pathology. Chronicity is defined for purposes of this analysis as participation in gambling in

both 1981 and 1984. Of the 194 gamblers in the sample, 43, or 22.16%, failed to meet the chronicity criterion. This means that 77.84% of Ohio gamblers in this sample are repeat gamblers whose involvement extends beyond one year. These are the gamblers whose progressivity and clinical signs are of greatest interest.

Absolute progressivity is measured as the difference between the annual wagers in 1984 and 1981. The behavioral data from Section IV of the questionnaire refer to amounts bet per game in 1981 and 1984. The calculation of the annual wager is quite straightforward: frequency times typical expenditure equals annual wager per game. The sum of these annual wagers across all of the games equals the total annual wager for that year. At the simplest level, progressivity is measured by taking the difference of the two annual wagers.

Overall, in 1981, annual wagers for gamblers ranged from \$.50 to \$1,561,180. The average annual wager in 1981 was \$17,349. But this is an overstatement due to the presence of a couple of unusually high rollers. For this reason, the median, \$170, is a better indicator of the normal betting behavior. In 1984, annual wagers ranged from \$.50 to \$246,960. The mean bet declined to \$4,597 but the median held relatively steady at \$171. The mean change in wagers, -\$13,380, is distorted by a single case of a gambler who wagered \$1,561,180 in 1981, but reduced the

wagers -\$1,536,180 in 1984. Interestingly enough, this gambler still wagered \$25,000 in 1984, an amount which is 5.4 times the average wager in 1984, and 146 times the medium bet in 1984. The median change in wager, on the other hand, is +\$10.00.

At a somewhat more complex level, progressivity is measured by taking the ratio of the absolute change in wagers to the annual wager in 1981. This ratio represents relative progressivity. The distribution of relative progressivity is tri-model. There were 14 gamblers whose relative change in wagers was $-.85$ to -1 ; there were 29 who did not change at all; and there were 34 gamblers whose relative change in wagers was 600%. The distribution of progressivity is displayed in table 15 which also groups cases into categories of change. Note that among those who increased their gambling during the period, 43 gamblers more than doubled their wagers and 40 held their increases to less than 100%. Therefore, it would be fair to say that progressivity usually leads, not to gradual increases in gambling expenditures, but very dramatic increases.

Relative progressivity is more simply categorized as positive, negative, or zero. Table 16 displays the distribution of relative progressivity in the sample. The bar chart shows a J-shaped curve (on its side). Less than 16% of the chronic gamblers are stabilized. The progressive gamblers outnumber the stable gamblers by more than 3 to 1

while the regressive gamblers outnumber the stable gamblers by one and one-half times. Among chronic gamblers, a person is 5.37 times as likely to change as to remain steady, and among changing gamblers, a person is 2.25 times as likely to increase the annual wager as to decrease it.

The importance of progressivity to the definition of pathological gambling is such that 18 cross-tabulations were run in order to examine the predictive value of progressivity. The dependent variables in these tests were: the ISR risk categories, the distribution of the clinical tests scores, the probability of scoring at all on the clinical tests, the probability of scoring on three or more of the clinical signs tests, the probability of scoring three or more points on the diagnostic criteria test, and the probability of scoring at all on the diagnostic signs test. Progressivity itself was further classified into two new variables called serious-progressive, which measured the extent of progressive gambling in five categories, and regressive-progressive, which measured the extent of regressive gambling in five categories.

Chi-square scores on all of these tests proved negative. Only one association, between the dichotomous clinical signs variable and the serious-progressive variable, was significant below the .1 level: that is, .056. Upon inspection, the Pearson's correlation coefficient, which is useful in describing the strength of

an observed association, was not significant below the .1123 level. These tests show that progressivity may be a necessary condition of pathological gambling but it is certainly not a very good predictor of the disease among Ohio's citizens.

Part III: The Cross-Tabulations of the Clinical Scores with the ISR Risk Classification

The purpose of constructing the clinical signs tests was to evaluate the 1984 ISR test results. Do the clinical signs test results corroborate the results of the ISR test? As discussed above, the clinical signs tests identify nearly three times the number of probable and potential pathological gamblers identified by ISR. Are the clinical cases also "at-risk" according to ISR? In order to answer these questions, the scores on the clinical tests were cross-tabulated with the ISR "at-risk" classifications. The results are displayed in table 17.

The range of clinical scores has been collapsed into two categories: yes or no, critical or not critical, thereby forming a two-by-two table. The table shows that in 71.42% of the cases, those who are "at-risk" on the ISR test are also scoring on at least one of the clinical signs tests. Yet, the chi-square statistic is very low, .044, with a significance level of .833, affording a confidence level no higher than 16.7%. Thus, the apparent correspondence between the two tests is a random event.

In table 18, the full distribution of the clinical signs is displayed. Two observations stand out. Firstly, there are 8.5 times as many cases showing clinical signs in the ISR non-risk category as there are in the ISR at-risk category. Secondly, there are more "non-risk" than "at-risk" cases at each successive level of the clinical signs distribution. Only those "at-risk" should be showing any clinical signs at all.

The chi-square score, 4.4, is not significant beyond the 65% confidence level. Thus, in general, the ISR risk classifications are not statistically associated with the distribution of clinical scores. It makes little difference how the ISR test classifies a case for purposes of predicting the number of clinical signs which it will register. Therefore, the ISR and clinical signs tests are not mutually corroborating.

The same conclusion is reached when the probability of scoring on three or more clinical tests and the probability of scoring three or more points on the diagnostic test are cross-tabulated with the ISR risk classifications. That is, no statistically significant association is observed. The only time when a significant association does occur between the ISR risk classifications and the clinical signs test is when either progressivity is 0 or the seriousness of progressivity is no greater than 25% of the 1981 annual wager. When progressivity is 0, chi-square is significant

to the +.0007 level. When a progressive gambler increases the annual wager by no more than 25% of the 1981 wager, then the chi-square score is significant to the +.0001 level and the Pearson's correlation co-efficient is significant to the .008 level. Therefore, the ISR test functions as an innocuous indicator of the distribution of the cumulative clinical test scores only among the 17 stable gamblers and the 24 slightly progressive gamblers. These two groups account for only 21% of the gamblers pool. This is the exact value of the ISR test in predicting the cumulative clinical scores of gamblers. It is a predictive value which is not visible in the majority of cases.

Part IV: The Question of Regressivity

If an individual is scoring on three or more of the clinical tests, how much of a cutback in gambling activity must that individual make before we are to believe that he/she is not a pathological gambler? The odds are better than 45000 to 1 that he/she is afflicted, that the report on gambling involvement is distorted to fit a denial pattern, that gambling will never stop altogether for any extended period of time, or will soon become progressive again. In the end, how can those who are exercising successful control over their gambling behavior be differentiated from those who are not? Standards of regressivity appropriate to cumulative scoring levels on the clinical signs tests are required.

A simple standard to apply, yet one which is reasonable, would adhere to the following rule: namely, exclude from the calculation all those whose level of regressivity is greater than their level of cumulative clinical test scores. For instance, any regressive gamblers whose cumulative scores are four or five would have to cut back their annual wagers by more than 90% in order to be declassified from the ranks of the probable pathological gamblers. All gamblers scoring on three clinical tests would have to reduce their annual wagers by more than 75% in order to escape inclusion, and so on. From table 19, the total number of regressive gamblers who scored on at least 1 of the clinical signs tests is 27 and the total to be retained in the count of potential or probable pathological gamblers is 10.

This standard, while reasonable, is arbitrary. It is arguable that, since the rankings are ordinal, rather than interval, they do not measure differences between the rankings in common terms. For instance, how many additional units of regressivity are equal to one additional P.I.V.F.H. test score? However, the purpose of the survey is to identify the potential market for outpatient treatment services. Therefore, it is important not to overlook those who try to get control of their gambling by cutting back only to find that their cutbacks are insufficient. In some sense, these are the very people most likely to seek

treatment when their own willpower fails. Can the reasoning which led to this standard be reinforced by any other objective measure?

Personal income is statistically associated with the distribution of cumulative clinical test scores with a chi-square score significant to the .0348 level and a Pearson's correlation coefficient significant to the +.0005 level. Household income is statistically associated with regressivity, but the association is significant only to the .0855 level (i.e., 91% rather than 95% confidence). The Pearson's correlation coefficient, however, is significant to the +.0316 level. Both of these income relationships are positive. Tables 20 and 21 display the cross-tabulations in detail.

Looking first at the most straight forward relationship, between personal income and clinical scores, it is evident that high incomes sustain the highest frequencies of cumulative clinical test scores at every level from the lowest to the highest, whereas, the higher cumulative scores fall off sharply in the lower income categories. Therefore, it would be fair to say that the higher the category of personal income, the more likely a gambler is to score on three or more of the clinical signs tests.

Looking next at the relationship between household income and regressivity, it appears that 56.4% of the 22

regressive gamblers are clustered in the highest income category of regressive gamblers (the \$30,000 to \$50,000 range). The remaining 43.6% are distributed across the lower income categories. However, when the 10 cases of regressive gamblers in the 51% to 75% or greater categories are isolated, then the relationship is completely reversed: only 40% of the total group are found in the highest income category. Therefore, it would be fair to say that the most regressive gamblers are to be found in the lower income categories.

The evidence suggests that as incomes rise cumulative scores on the clinical tests also rise, but the pressure to cut back in response to those scores decreases. Income tends to mask the clinical signs of distress and, thus, efforts to curtail gambling are likely to lag behind the level of gambling involvement. When there is evidence that the opposite is true, that is, when regressivity exceeds the level of clinical distress, then the gambler is demonstrating appropriate and rational control over his or her gambling activities. When such evidence is lacking, then, even though the gambler is regressive, he or she is probably a pathological gambler.

Interestingly enough, when household income is correlated with progressivity, the chi-square score is not significant below the .34 level. Therefore, it can be

safely assumed that the amount of increase in wagers over time is unrelated to the level of household income.

Part V: The Distribution of the Diagnostic Criteria, or Hard Signs

As previously described in Chapter V of this report, the diagnostic test identified 8 bona fide cases of gambling pathology. These individuals answered in the affirmative on three out of the five criteria. An additional 23 individuals admitted to one or two of the five criteria. In all, 29 gamblers showed the hard signs of gambling pathology. How are these cases distributed across the cumulative clinical signs tests? It is to be expected that the statistical association between the diagnostic and the cumulative clinical signs tests will be highly significant since the diagnostic test is one of those clinical tests. Yet, it will be interesting to observe the pattern of the scores just as we did with the ISR test. The validity of the diagnostic test is manifest. The questions are whether or not the results of the cumulative clinicals signs tests correspond to the results of the diagnostic test, and whether or not scoring at all on the diagnostic test predicts the cumulative clinical score.

Table 22 shows that all of the diagnosed cases of gambling pathology scored on three or more of the clinical tests. Table 23 shows that this correspondence does not pertain to those who scored one or two on the diagnostic

test. Furthermore, if the diagnosed cases (8) are removed from table 23, then there are about the same number of cases which scored one or two on the diagnostic test in the non-critical range (10) as there are in the critical range (11) of the cumulative clinical signs test. Thus, the predictive power of the diagnostic test is 100% if the respondent scores three or more and it is only 50% if the respondent scores less than three.

When the diagnostic test (8 cases) is cross-tabulated with the distribution of the cumulative clinical tests scores and progressivity is controlled, then there are as many diagnosable cases among the regressives (3) as there are among the progressives (3). This demonstrates, once again, that progressivity is not a good predictor of gambling pathology, and also that it would be an error to exclude a case from the count of pathological gamblers just because it is a regressive case.

Part VI: Integrating the Findings

It is now possible to count the number of pathological gamblers in the sample, and to set up a model which can be compared with the ISR model. First of all, there are 194 gamblers in the sample. Of these, 43 did not pass the chronicity test and 51 did not score on the cumulative clinical signs tests, and there were 13 overlaps between these two groups. Consequently, there were 113 chronic

gamblers who also scored on the cumulative signs test, or 14.1% of the sample.

Secondly, of those "at-risk" according to the cumulative clinical signs tests, 60 are to be dropped because they only scored on one of the tests. Additionally, there are 6 cases which are to be dropped because, although they scored on two or more of the clinical signs tests, they also showed sufficient regressivity in their total annual wagers between 1981 and 1984 that they are probably not pathological gamblers. Therefore, the total number of cases to be dropped at this stage is 66. The "at-risk" pool has now been refined to a group of 47 cases, or 5.86% of the sample who are potentially pathological gamblers.

Thirdly, this "refined" group of potential pathological gamblers can be further distilled to produce a group of gamblers for whom the odds in favor of being a pathological gambler are particularly acute: better than 45,000 to 1. There are 5 remaining regressive gamblers who scored on just 2 of the clinical signs tests. Among the stable gamblers, there were 4, and among the progressive gamblers there were 18, who scored on just 2 of the clinical signs tests. The total, 27 cases, or 3.37% of the sample, can be subtracted from the refined "at-risk" pool, leaving 20 cases of probable pathological gamblers. Of these, 12 cases, or 1.498% of the sample can be subtracted from the probable pathological gamblers group because they did not pass the

diagnostic test. The remainder, 8 cases, or .998% of the sample, represents the diagnosable cases detected in this survey.

Part VII: Comparing the ISR and the Clinical Signs Models

Table 24 compares the results of the cumulative clinical signs test model with the results of the ISR model. Firstly, the clinical tests exhibit much greater sensitivity than the ISR test. The clinical tests identify 5.86% of the sample who are "at-risk" of gambling pathology in comparison to just 2.62% of the sample identified by the ISR tests. This represents a 150% difference in the relative sizes of the "at-risk" pools.

Secondly, the clinical tests exhibit much greater specificity than the ISR test. The clinical tests differentiate three sub-classifications of gamblers all of whom are characterized as pathological gamblers. Each sub-classification is associated with explicit cumulative confidence levels and known odds which allow for the estimation of particular errors in prediction. By comparison, the ISR test identifies three sub-classifications, only two of which are related to the target population. The third, and largest sub-group, called "other" contributes nothing to our understanding of the dimensions of the pathological gambling problem and must be discarded from any further analysis.

Thirdly, the diagnostic test identifies 8 bona fide cases of gambling pathology. That is, probability theory is not required to make this designation. The bona fide cases alone are nearly the equal to the 9.03 combined cases which ISR identifies as probable and potential pathological gamblers. This observation suggests that, only by collapsing the potential/probable sub-classifications does the ISR model predict the number of diagnosable cases in the population. However, it also suggests that the ISR test understates the probable magnitude of the prevalence rate by 55% to 80%. Since the 1975 ISR study lacked an authentic diagnostic test, it may be possible that the 1975 study understated the national prevalence rate as well.

Chapter 7: Summary and Conclusions

The estimates derived from the cumulative clinical signs test are significantly different from those derived from the ISR model, but then the operant principles of discrimination are also different. The probability-of-inclusion level for the ISR "at-risk" pool was set at .2. In the clinical signs test, it was set at .6. Conversely, the confidence levels are 80% and 40% respectively. The rationale behind this arrangement is that the test is grounded in the clinical signs of gambling pathology, whereas, the latter ISR test is made up of scales describing the personal characteristics possessed, although not exclusively, by pathological gamblers. Furthermore, the clinical signs test precludes non-gamblers from the "at-risk" pool, whereas, the ISR test was originally applied to gamblers and non-gamblers alike. Therefore, the ISR test required a much lower probability-of-inclusion level in its original design. Additionally, the clinical signs test precludes gamblers who are not chronic gamblers from ever taking the test, and therefore, it excludes them from the "at-risk" pool. Chronicity is a necessary but not sufficient condition for the diagnosis of gambling pathology. All of the diagnosable cases are also chronic gamblers, for instance. But chronicity was not a pre-condition of inclusion in the ISR "at-risk" pool.

Finally, the odds in favor of a diagnosis of gambling pathology at the .6 probability-of-inclusion level when using the clinical signs test are already 13 to 1. Consider that 6 out of the 80 cases, or more than 7% of the gamblers who do not continue in the "at-risk" pool beyond this level, have scored on the diagnostic test. It might be argued, therefore, that even proceeding to the .4 probability-of-inclusion level, potential cases of gambling pathology have been erroneously excluded.

With all of these safeguards or allowances built into the model--the more select sample of respondents, the more direct, specifically clinical and behavioral approaches to discrimination--the risks of misclassification associated with the .6 probability-of-inclusion level are much less than the corresponding risks would be when relying upon the ISR test.

The aforementioned principles are operating in the cumulative clinical signs test at each subsequent stage of the discrimination. As the probability-of-inclusion level is reduced from .4 to that of the ISR test, an additional principle, that of relating the distribution of clinical signs to changes in the amount of gambling involvement, is simultaneously introduced. By relating further inclusion in the "at-risk" pool objectively to progressivity and regressivity of gambling behavior, the quality of the discrimination is further refined.

Once the .2 probability-of-inclusion level has been reached, no lower standard for discrimination is warranted. The odds in favor of a diagnosis of gambling pathology for those remaining in the pool are 45,000 to 1 or better. On the other hand, the ISR researchers decided that it was still necessary for them to personally inspect the cases remaining in their pool in order to eliminate, at this point in the analysis, all remaining cases of non-gamblers and non-gambling related pathologies. In short, the further classification by subjective inspection of the ISR "at-risk" pool was necessary in order to fortify the specificity of the discriminance test itself.

In conclusion, then, TPA recommends that, for purposes of estimating the current prevalence rate of pathological gamblers in the state of Ohio, the predictions based upon the cumulative clinical signs test be adopted. Given a total adult population in Ohio of 7,703,310 persons, TPA predicts that there are probably 192,227 pathological gamblers. Additionally, there are another 259,601 gamblers who demonstrate the potential for either being pathological gamblers at present, or becoming pathological gamblers in the future.

Footnotes

1. For a detailed graph of the syndrome, see Appendix A.
2. "In reviewing these data, it is important to note that persons who reported that they lived in Nevada because of legalized gambling were excluded from the ISR sample." ISR Report. 1976.
3. H. Kallick, D. Suits, T. Dielman, J. Hybels, A Survey of American Gambling Attitudes and Behavior (Ann Arbor, MI: University of Michigan, The Institute for Survey Research, 1976) p. 429 and 443.
4. *ibid* p. 423.
5. *ibid* p. 427.
6. *ibid* p. 474
7. L. Nadler, L. Mellonics, The Conduct of Pathological Gambling Research: Covering All Bets (Unpublished Paper presented to the Fifth National Conference on Gambling and Risk Taking at Lake Tahoe, Nevada, October 22-25, 1981) pgs. 9-11.
8. Tor Meeland, Director, National Foundation for the Study and Treatment of Pathological Gambling and Dr. Samuel Krug, of the University of Illinois, collaborated to develop and test the Inventory of Gambling Behavior, 1982. (See also, Custer, 1978).
9. $1 - 15.7\% \text{ (holding steady)} = 84.3\% \text{ (not holding steady)}$.
 $84.3\% / 15.7\% > 5 \text{ to } 1$.
10. *Op. cit.* Kallick et al. p. 418, et seq.
11. *Op. cit.* Kallick et al. p. 421.
12. *Op. cit.* Kallick et al. p. 422 et seq.
13. *Op. cit.* Kallick et al. p. 427. The authors insert the following caveat in their description of the methodology: "It is entirely possible that people in the general population who resemble the compulsive gambler profile to a greater extent than the church member profile do so either because they actually are compulsive gamblers, have a propensity for becoming such, or possibly they exhibit some

other abnormal personality characteristic which places them closer to the profile of the compulsive gambler. For this reason, the probability level of classification as a compulsive gambler was deliberately set quite high."

14. Op. cit. Kallick et al. Table 12.2-1 p. 424 et seq.

15. The point of such a test is to be able to classify cases into two groups whose scores are most different when the groups themselves are controlled (between-group differences), and relatively less different from the scores of other group members (within-group differences). The discriminant function (L) is a linear equation which maximizes the ratio of between-group to within-group variation in the test scores. Presumably, each group member shares in certain characteristics. That is, the test is not only discriminatory, but it is assumed to be associative. That is because the discriminant function (L) is derived from the pretest scores of two known groups which are distinct from one another along a single dimension.

By setting the discriminant function weights equal to 1, the test is hampered only in so far as the amount of total variance associated with random population variance cannot be controlled. Since the I.S.R. variables are known to be highly discriminatory, this population variance ought not to mask entirely the overall difference between the test scores of the classificatory groups. There may be some numbing of discrimination on a variable by variable basis. Furthermore, there may be some lessening of the association between the test scores and the model scores on the individual items. As will be demonstrated, the cutoff point can be utilized as a lens to focus the discriminance test so that both discrimination and association are maximized.

16. op. cit. p. 474

17. .998% (1984 "Hard-risk") - .77% (1975 Probable) = .228%

18. .998% - .77% = .228% .228% / .77% = 29.61%

19. The diagnostic variables for the "hard" signs test in part V of the questionnaire were described for me by Dr. Robert Custer.

20. The themes around which the "soft" signs were grouped into additional clinical tests were first suggested to me by Dr. Robert Politzer.

21. The data were compiled from two samples which answered the same questionnaire. The first sample was a group of 83

gamblers anonymous members. The second sample was a group of 61 kiwanis club members who sometimes gamble. The total cases involved 144 individuals, randomly selected for participation. Although these samples are, technically speaking, large enough to warrant reference to a standard normal probability distribution, the variance associated with the sample design or sampling technique is unknown.

$$22.13 - 8 = 5 / 8 = 62.5\%$$

Table 1. Participation in Twelve Games of Chance**

	<u>1981</u>		<u>1984</u>		<u>Favorite</u>	
	<u>Freq.</u>	<u>%</u>	<u>Freq.</u>	<u>%</u>	<u>Freq.</u>	<u>%</u>
Horses	56 (3)	7.0	46 (4)	5.7	19 (3)	2.4
Sports	44 (5)	5.4	40 (5)	5.0	14	1.7
Lottery*	81 (2)	10.1	158 (1)	19.7	45 (2)	5.7
Casino*	24	2.99	31	3.87	11	1.3
Charity*	25	3.1	32	3.99	3	.4
Family Games	82 (1)	10.2	77 (2)	9.6	48 (1)	6.0
Bingo*	23	2.9	33	4.1	16 (4)	2.0
Poker* Machine	10	1.3	14	1.7	2	.3
Office* Pools	54 (4)	6.7	57 (3)	7.2	16 (5)	2.0
Horses Bookie	8	1.0	5	.6	1	.2
Sports Bookie	9	1.2	7	.8	1	.2
Numbers	6	.7	3	.4	---	---

*Participation rate increased from 1981 and 1984.

**The top five games are ranked in parentheses by frequency of respondents playing each game.

Table 2. Table of Control Scores - 15 Vars-Mich

	<u>PG's</u>	<u>Church-goers</u>	<u>Grand Mean</u>
Anxious	1.751	2.314	2.0325
Careless	2.518	3.405	2.9615
Conventional	2.396	1.809	2.1025
Good Natured	1.445	1.548	1.4965
Irresponsible	2.754	3.83	3.292
Show Off	2.330	3.297	2.8135
Better Off in Old Days	2.798	2.981	2.8895
Prefer to Play for Dollars	1.176	1.89	1.533
Higher Stakes	1.266	1.962	1.614
Go for Broke	1.198	1.924	1.561
Uranium Mining Venture	1.629	1.809	1.719
Conserve Dollars	1.763	1.169	1.466
Never Put All of my Dollars into a Venture	1.462	1.059	1.2605
Procrastinate	1.048	1.017	1.0325
Elections	1.189	1.109	1.149
Truth Teller	1.096	1.325	1.2105
Ethics	2.004	1.440	1.722
Fear Hurt/Enjoy Danger	1.713	2.7825	2.24775
Total	31.536	36.6705	34.10325

Table 3. The Discriminant Power of the 18 ISR Variables

<u>Variable Labels</u>	<u>Five Propability of Inclusion Levels</u>					
	<u>.04</u>	<u>.1</u>	<u>.2</u>	<u>.25</u>	<u>.5</u>	<u>Total</u>
<u>Anxious</u>	0	0	0	1	1	2
<u>Careless</u>	1	1	1	1	1	5
<u>Good Natured</u>	0	0	0	0	0	0
<u>Conventional</u>	0	0	0	1	1	2
<u>Irresponsible</u>	1	1	1	0	0	3
<u>Put On Show</u>	0	0	0	1	1	2
<u>Better Off In Old Days</u>	0	0	0	1	0	1
<u>Ethics</u>	0	0	1	1	1	3
<u>Safety</u>	1	1	1	1	1	5
<u>Go For Broke</u>	0	0	0	0	0	0
<u>The Higher the Stakes</u>	0	0	0	0	0	0
<u>Rather Play For Dollars</u>	0	0	1	0	0	1
<u>Uranium Mining</u>	0	0	1	0	0	1
<u>Never Invest All Dollars</u>	0	0	0	1	1	2
<u>Conservative With Dollars</u>	0	0	0	1	1	2
<u>Procrastinate</u>	0	0	0	0	0	0
<u>Elections</u>	1	1	1	1	1	5
<u>Truth Teller</u>	0	0	0	0	0	0
<u>Total</u>	4	4	7	10	9	34
<u>Total Gamblers In "AT-Risk" Pool</u>	6	11	17	38	56	

Table 4. The Associative Power of the 18 ISR Variables

<u>Variables Labels</u>	<u>Five Probability Levels of Inclusion</u>						
		<u>.04</u>	<u>.1</u>	<u>.2</u>	<u>.25</u>	<u>.5</u>	<u>Total</u>
<u>Anxious</u>	<u>PG/R</u>	0	0	1	1	1	2
	<u>R/CG</u>	1	0	1	1	1	1
	<u>CG/NR</u>	1	1	1	1	1	0
<u>Careless</u>	<u>PG/R</u>	0	0	0	0	0	5
	<u>R/CG</u>	1	1	1	1	1	0
	<u>CG/NR</u>	0	0	0	0	0	5
<u>Good Natured</u>	<u>PG/R</u>	0	0	0	0	1	4
	<u>R/CG</u>	1	1	1	1	1	0
	<u>CG/NR</u>	1	1	1	1	1	0
<u>Conventional</u>	<u>PG/R</u>	0	0	1	1	1	2
	<u>R/CG</u>	0	0	1	1	1	3
	<u>CG/NR</u>	1	1	1	1	1	0
<u>Irresponsible</u>	<u>PG/R</u>	0	0	0	0	0	5
	<u>R/CG</u>	1	1	1	1	1	0
	<u>CG/NR</u>	1	1	1	1	1	0
<u>Put On Show</u>	<u>PG/R</u>	0	0	1	1	1	2
	<u>R/CG</u>	0	0	1	1	1	2
	<u>CG/NR</u>	0	0	0	0	0	5
<u>Better Off In Old Days</u>	<u>PG/R</u>	0	0	0	1	1	3
	<u>R/CG</u>	1	1	1	1	1	0
	<u>CG/NR</u>	1	1	0	0	0	3
<u>Ethics</u>	<u>PG/R</u>	0	0	1	1	1	2
	<u>R/CG</u>	0	0	0	0	0	5
	<u>CG/NR</u>	1	1	1	1	1	0
<u>Safety</u>	<u>PG/R</u>	0	1	0	1	0	3
	<u>R/CG</u>	1	1	1	0	1	1
	<u>CG/NR</u>	1	0	0	1	0	3
<u>Go For Broke</u>	<u>PG/R</u>	1	1	1	1	1	0
	<u>R/CG</u>	0	1	1	1	1	1
	<u>CG/NR</u>	1	1	1	1	1	0
<u>The Higher The Stakes</u>	<u>PG/R</u>	1	1	1	1	1	0
	<u>R/CG</u>	1	1	1	1	1	0
	<u>CG/NR</u>	1	1	1	1	1	0

(Table 4. Continued)

<u>Rather Play</u>						
<u>For Dollars</u>	<u>PG/R</u>	0	1	1	1	1
	<u>R/CG</u>	1	1	1	1	0
	<u>CG/NR</u>	1	1	1	1	0
<u>Uranium</u>						
<u>Mining</u>	<u>PG/R</u>	1	1	0	1	1
	<u>R/CG</u>	0	0	0	1	3
	<u>CG/NR</u>	1	1	1	1	0
<u>Never Invest</u>						
<u>All Dollars</u>	<u>PG/R</u>	0	1	1	1	1
	<u>R/CG</u>	0	0	0	0	5
	<u>CG/NR</u>	1	1	1	1	0
<u>Conservative</u>						
<u>With Dollars</u>	<u>PG/R</u>	1	1	1	1	0
	<u>R/CG</u>	0	0	0	1	4
	<u>CG/NR</u>	0	0	0	1	3
<u>Procrastinate</u>						
	<u>PG/R</u>	0	0	0	0	5
	<u>R/CG</u>	0	0	0	1	3
	<u>CG/NR</u>	1	1	1	1	0
<u>Elections</u>						
	<u>PG/R</u>	0	0	0	0	5
	<u>R/CG</u>	0	0	0	0	4
	<u>CG/NR</u>	1	1	1	1	0
<u>Truth Teller</u>						
	<u>PG/R</u>	0	0	1	1	2
	<u>R/CG</u>	0	0	0	1	4
	<u>CG/NR</u>	1	1	1	1	0
<u>Totals</u>	<u>PG/R</u>	9	11	8	5	5
	<u>R/CG</u>	10	10	8	4	4
	<u>CG/NR</u>	3	4	5	3	4
<u>PG/R and CG/NR</u>						
<u>But Not R/CG: 010</u>		1	1	3	1	2
<u>PG/R But Not</u>						
<u>R/CG: 011</u>		6	3	2	3	3
<u>Total Successful</u>						
<u>Associations</u>		7	4	5	4	5

Key to Table 4.

PG/R: Pathological Gambler/At-Risk Groups

CG/NR: Church-Goer/Not-At-Risk Groups

R/CG: At-Risk/Church-Goer Groups

Table 5. Summary of Discriminations and Associations

<u>Outcomes</u>	<u>Five Probability Levels of Inclusion</u>				
	.04	.1	.2	.25	.5
<u>Discriminations</u>	4	4	7	10	9
<u>Associations (PG/R But Not R/CG).</u>	7	4	5	4	5
<u>Discriminations and Associations (PG/R But Not R/CG).</u>	3	2	3	1	3
<u>Association (PG/R But Not R/CG) But Not Discrimination</u>	4	2	2	3	2
<u>Discrimination But Not Association (PG/R But Not R/CG)</u>	1	2	4	9	6
<u>Total Discriminating and Associating (PG/R But Not R/CG) Variables</u>	8	6	9	13	11
<u>Neither Association Nor Discrimination</u>	10	12	9	5	7

Conclusions: The optimal cutoff in absolute terms is the .25 probability of inclusion level. This cutoff has the fewest number of non-functioning variables (5), and the highest level of discrimination (10). Unfortunately, the .25 cutoff also has the lowest level of associations (4) and joint discriminations and associations (1). In fact, 90% of the discriminating variables render no PG/R associations. Therefore, the optimal cutoff in relative terms is the .2 probability of inclusion level. This cutoff has 7 discriminations, and it has a higher level of associations (5), as well as ratio of joint discrimination and association of 43%. At this cutoff point, 9 of the 18 variables, or 50%, do not function and may be dropped. The variables to be dropped at the .2 cutoff point are: 1) Anxious, 2) Conventional, 3) Put on a Show, 4) Go for Broke, 5) The Higher the Stakes, 6) Never Invest all Dollars, 7) Conservative with Dollars, 8) Procrastinate, 9) Truth Teller.

TABLE 6. THE ISR MODEL OF THE PREVALENCE RATE OF
PATHOLOGICAL GAMBLING: NATIONAL SAMPLE, 1975

SAMPLE SIZE (N) = 1736

"AT-RISK" POOL
(PROBABILITY-OF-INCLUSION LEVEL = .04)

CASES	%SAMPLE
278	16*

CATEGORIES OF FURTHER CLASSIFICATION:
PERCENT OF "AT-RISK" POOL

A. PROBABLE COMPULSIVE GAMBLERS	9%
B. POTENTIAL COMPULSIVE GAMBLERS	15%
C. OTHER PATHOLOGY	18%
D. POOR COMPREHENSION, ILLITERATE	14%
E. OTHERS	44%

A.	B.	C.	D.	E.
25.0	42.0	50.0	39.0	122.0
CASES	CASES	CASES	CASES	CASES
1.44	2.42	2.88	2.55	7.03

*BASED UPON THE ISR WEIGHTED SAMPLE SIZE.

TABLE 7. THE ADJUSTED ISR MODEL OF THE PREVALENCE RATE OF
PATHOLOGICAL GAMBLING: NATIONAL SAMPLE, 1975.

SAMPLE SIZE (N) = 1736

GAMBLERS

CASES	%SAMPLE
1059	61

"AT-RISK"
(PROBABILITY-OF-INCLUSION LEVEL=.04)

CASES	%GAMBLERS
156	14.73

CATEGORIES OF FURTHER CLASSIFICATION:
PERCENT OF "AT-RISK" POOL

A. PROBABLE COMPULSIVE GAMBLERS	16%
B. POTENTIAL COMPULSIVE GAMBLERS	27%
C. OTHER PATHOLOGY OR POOR COMPREHENSION	57%

A.	B.	C.
25.0	42.0	89.0
CASES	CASES	CASES
1.44	2.42	5.13
% SAMPLE	% SAMPLE	% SAMPLE

TABLE 8. THE ISR MODEL OF THE PREVALENCE RATE OF
PATHOLOGICAL GAMBLING: EXPECTED FREQUENCIES, OHIO SAMPLE,
1985

SAMPLE SIZE (N) = 801

GAMBLERS

CASES	%SAMPLE
194	24.21

"AT-RISK"
(PROBABILITY-OF-INCLUSION LEVEL = .2)

CASES	%GAMBLERS
29	14.73

CATEGORIES OF FURTHER CLASSIFICATION:
PERCENT OF "AT-RISK" POOL

A. PROBABLE COMPULSIVE GAMBLERS	16%
B. POTENTIAL COMPULSIVE GAMBLERS	27%
C. OTHER PATHOLOGY OR POOR COMPREHENSION	57%

PROBABLE

CASES
4.64

%SAMPLE
.579

POTENTIAL

CASES
7.83

%SAMPLE
.97

OTHER

CASES
16.53

%SAMPLE
2.06

TABLE 9. THE ISR MODEL OF THE PREVALENCE RATE OF
PATHOLOGICAL GAMBLERS: OBSERVED FREQUENCIES, OHIO SAMPLE,
1985

SAMPLE SIZE (N) = 801

GAMBLERS

CASES	%GAMBLERS
194	24.21

"AT-RISK"
(PROBABILITY-OF-INCLUSION LEVEL = .2)

CASES	%GAMBLERS
21	10.82

CATEGORIES OF FURTHER CLASSIFICATION
PERCENT OF "AT-RISK" POOL

A. PROBABLE COMPULSIVE GAMBLERS	16%
B. POTENTIAL COMPULSIVE GAMBLERS	27%
C. OTHER PATHOLOGY OR POOR COMPREHENSION	57%

PROBABLE	POTENTIAL	OTHER
CASES	CASES	CASES
3.36	5.67	12.0
%SAMPLE	%SAMPLE	%SAMPLE
.42	.71	1.49

TABLE 10. THE COMPARISON OF THE EXPECTED AND OBSERVED "AT-RISK" POOLS, OHIO SAMPLE, 1984

EXPECTED (E)

"AT-RISK"

CASES	%GAMBLERS
29	14.73

PROBABLE

POTENTIAL

OTHER

CASES	%SAMPLE
4.64	.579

CASES	%SAMPLE
7.83	.97

CASES	%SAMPLE
16.53	2.06

OBSERVED (O)

"AT-RISK"

CASES	%GAMBLERS
21	10.8

PROBABLE

POTENTIAL

OTHER

CASES	%SAMPLE
3.36	.42

CASES	%SAMPLE
5.67	.71

CASES	%SAMPLE
12.0	1.49

DIFFERENCE (O-E)

"AT-RISK"

CASES	-8
%GAMBLERS	-4.12
%CHANGE	-28
(O-E/E)	

PROBABLE

POTENTIAL

OTHER

CASES	- 1.28
%SAMPLE	- .159
%CHANGE	-28.0
(O-E/E)	

- 2.16
- .26
-28.0

- 4.53
- .57
-27.4

TABLE 11. THE COMPARISON OF THE EXPECTED AND OBSERVED "AT-RISK" POOLS, OHIO SAMPLE, 1984: APPLYING THE DIAGNOSTIC TEST.

EXPECTED (E)	"AT-RISK"	
	CASES	%GAMBLERS
	29	14.73
PROBABLE	POTENTIAL	OTHER
CASES	CASES	CASES
4.64	7.83	16.53
%SAMPLE	%SAMPLE	%SAMPLE
.57	.97	2.06
%RISK POOL	%RISK POOL	%RISK POOL
16.0	27.0	57.0
.....		

OBSERVED (O)	"AT-RISK"	
	CASES	%GAMBLERS
	21	10.82
PROBABLE	POTENTIAL*	OTHER
CASES	CASES	CASES
8.0	13.49	0.0
%SAMPLE	%SAMPLE	%SAMPLE
.998	1.68	0.0
%RISK POOL	%RISK POOL	%RISK POOL
38.1	64.23	0.0

TABLE 11. (CONTINUED)

DIFFERENCE (O-E)

"AT-RISK"

CASES -8
 %GAMBLERS -4.12
 %CHANGE -28
 (O-E/E)

PROBABLE

POTENTIAL

OTHER

CASES	+ 3.36	+ 5.66	- 16.53
%SAMPLE	+ .419	+ .71	- 2.06
%CHANGE (O-E/E)	+72.36	+72.36	-100.0

*THE NUMBER OF "OBSERVED" POTENTIAL CASES IS ACTUALLY AN ESTIMATE WHICH ASSUMES THE SAME RATE OF INCREASE FOR POTENTIAL CASES AS WAS OBSERVED FOR THE PROBABLE CASES. AS A RESULT THERE ARE NO "OTHER" CASES IN THIS MODEL.

Table 12. IGB Variables, By Theme, with χ^2 and Frequency of Answering in the Affirmative

	χ^2	Frequency Pathological	Frequency Non-Pathological
<u>Personal</u>			
"After a win, I have a strong urge to return and win more."	98.4	58.45%	7.75%
<u>Personal</u>			
"After losing, I feel I have to return to gambling as soon as possible and win back my losses."	127.43	58.86%	1.418%
<u>Personal</u>			
"Sometimes, when I gamble, and I have been losing, afterwards, I feel a sense of remorse."	111.79	57.34%	7.69%
<u>Personal</u>			
"Since I started gambling, I seem to be less efficient at other things I do, and less ambitious."	106.17	52.44%	0
<u>Interpersonal</u>			
"Gambling sometimes makes me feel like a 'bigshot,' or somebody others look up to."	103.74	55.63%	3.52%
<u>Interpersonal</u>			
"For me, gambling is more important than social activities."	133.91	57.04%	0
<u>Interpersonal</u>			
"Sometimes, I try to avoid conflicts by lying." (Section II.)	72.9	56.64%	13.28%

Table 12 continued

Interpersonal

"Sometimes I brag about winning money from gambling even though I actually lost"	63.62	42.25%	2.11%
--	-------	--------	-------

Vocational

"Gambling had a poor effect on my performance in school."	94.9	47.48%	0
---	------	--------	---

Vocational

"I have lost time from work on occasion, due to gambling."	105.45	51.06%	0
--	--------	--------	---

Vocational

"Gambling has affected my reputation."	120.28	54.54%	0
--	--------	--------	---

Vocational

"My employer has been distressed by my absence from work."	18.1	15.97%	0
--	------	--------	---

Financial

"I have gambled in order to get money with which to pay debts or otherwise solve financial difficulties."	116.59	53.84%	0
---	--------	--------	---

Financial

"When paying off a debt with gambling winnings, I will keep a reserve for gambling."	115.27	54.93%	.7%
--	--------	--------	-----

Table 12 continued

<u>Financial</u> "I have financed gambling either by pawning family jewelry, or selling off personal or real property."	105.32	50.69%	0
<u>Financial</u> " I have occassionally borrowed or taken money even I had my own money to bet"	81.44	45.07%	.007%
<u>Hard Sign</u> Big win equal to one month's salary or more?	0	38.73%	.7%
<u>Hard Sign</u> Borrow money, from legal or other sources, in order to finance gambling?	0	40.84%	35.9%
<u>Hard Sign</u> Defaulted on a loan due to gambling?	0	36.36%	1.398%
<u>Hard Sign</u> Bailed out of a gambling debt by your spouse, your parents, friends, or anyone else?	0	40.59%	.7%
<u>Hard Sign</u> Has your gambling made you or your family quarrelsome at home, or made your homelife unhappy in any other way?	0	57.04%	0
<u>Hard Sign</u> Has gambling caused you to become careless of your family?	0	53.78%	0

Table 12 continued

Hard Sign

Caused problems for your spouse or
or your children?

0

44.69%

0

Hard Sign

Did you ever commit, or consider
committing an illegal act, such as
forgery, fraud, embezzlement, or tax
evasion in order to finance gambling?

0

3.84%

0

Table 13. Probabilities of Scoring on the Cumulative Clinical Signs Tests

	Probability of an Affirmative	Cumulative Probability Affirmative	Probability Affirmative Pathologi- cal Gambler	Cumulative Probability Affirmative	Probability Non-Patholg- ical Gambler	Cumulative Probability Affirmative	Odds In Favor of Affirmative by Pathologi- cal Gambler
Personal	.6098	.6098	.5677	.5677	.0421	.0421	13.48
Inter- Personal	.5761	.3513	.5289	.3002	.0472	.0019	158.00
Financial	.513	.1802	.5112	.1534	.0017	.0000034	45,117.64
Hard Signs	.4431	.0798	.3948	.0605	.0484	.0000002	302,500
Vocational	.4226	.0378	.4226	.0255	0	.00000001*	2,550,000

*Arbitrary estimate.

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Table 14. The Frequency Distribution of the Cumulative Clinical Signs Test

Value Label	Value	Frequency	Percent
	.00	51	26.4
	1.00	80	41.4
	2.00	39	20.3
	3.00	11	5.6
	4.00	10	5.2
	5.00	3	1.4
	Total	<u>194</u>	<u>100.0</u>

Mean	1.262	STD ERR	.082	Median	1.000
STD DEV	1.149	Minimum	.000	Maximum	5.000

Table 15. Progressivity as a Proportion of 1981 Annual Wagers

<u>.01 to .25</u> <u>times</u>	<u>.26 to .5</u> <u>times</u>	<u>.51 to .75</u> <u>times</u>	<u>.76 to 1.0</u> <u>times</u>	<u>1 to 5</u> <u>times</u>	<u>5 to 10</u> <u>times</u>	<u>16</u> <u>times</u>
20	9	4	4	0	34	5

<u>26</u> <u>times</u>	<u>36</u> <u>times</u>	<u>86</u> <u>times</u>
2	1	1

Table 16. The Barchart of Progressive, Stable, and Regressive Gamblers

Value Label	Value	Frequency	Percent	Valid Percent
Regressive	-1.00	39	20.4	26.1
Stable	.00	24	12.2	15.7
Progressive	1.00	88	45.3	58.2
		43	22.1	Missing
Total		194	100.0	100.0

Regressive	-1.00	39
------------	-------	----

Stable	.00	24
--------	-----	----

Progressive	1.00	88
-------------	------	----

I.....I.....I.....I.....I.....I
0 12 24 36 48 60
Percent

Mean	.32	STD ERR	.07	Variance	.745
STD DEV	.863	Minimum	-1.000	Maximum	1.000
Valid Cases	134	Missing Cases	29		

Table 17. The Cross-tabulation of the ISR Risk Classifications by the "At-Risk" Categories of the Cumulative Clinical Signs Test

	ISR <u>"Not-at-Risk"</u> 0	ISR <u>"At-Risk"</u> 1	
<u>Cum Clinial Signs</u>			
<u>"Not-at-Risk"</u> 0	45	6	51 (26.4%)
<u>"At-Risk"</u> 1	128	15	143 (73.6%)
<u>Total</u>	173 89.2%	21 10.8%	194 (100%)
 Chi-Square	 Degree of Freedom	 Significance	
 .0444	 1	 .833	

Table 18. The Cross-tabulation of the ISR "at-risk"
Classifications by the Frequency Distribution of Cumulative
Clinical Test Scores

Cum Clinical Scores	ISR		ISR	
	<u>"Not-at-Risk"</u>		<u>"At-Risk"</u>	
1	72		8	80 (55.8%)
2	35		4	39 (27.5%)
3	11		0	11 (7.7%)
4	7		3	10 (7.1%)
5	3		0	3 (1.9%)
Total	128 (89.8%)		15 (10.2%)	143 (100%)
Chi-square	Degrees of Freedom		Significance	
4.416	4		.3526	

Table 19. The Cross-tabulation of Relative Regressivity by Cumulative Clinical Signs Test

Count	Reprog					Row Total
Exp Val	<u>-.25</u>	<u>-.5</u>	<u>-.75</u>	<u>-.9</u>	<u>1.0</u>	
Row Pct						
Col Pct						
Cum Clinical Scores						
1	2	4	2	5	0	12 43.8%
2	2	3	1	1	3	10 36.6%
4	0	1	1	0	1	4 14.7%
5	0	1	0	0	0	1 4.9%
Column Total	4 14%	9 33.6%	4 15.8%	6 20.8%	4 15.8%	27 100.0%

Chi-Square
12.279

D.F.
12

Significance
0.4235

Pearson's R
+0.2168

Significance
0.4572

Table 20. The Cross-tabulation of Cumulative Clinical Signs Test by
Personal Income

Personal Income	Under \$5000	\$5001/ \$10000	\$10001/ \$15000	\$15001/ \$20000	\$20001/ \$30000	\$30000/ \$50000	
Cum Clinical Scores							
1	15	9	9	14	13	8	66 54.3%
2	8	5	8	3	9	3	36 29.6%
3	0	1	0	0	5	4	10 7.8%
4	1	0	0	0	4	3	7 6.1%
5	0	0	0	0	3	0	3 2.2%
Column Total	24 19.4%	14 11.4%	16 13.3%	17 14.0%	33 27.3%	18 14.7%	123 100%
<u>Chi-Square</u>	<u>D.F.</u>	<u>Sig.</u>	<u>Pearson's "R"</u>	<u>Sig.</u>	<u>Missing Cases</u>		
32.874	20	.0348	+.2919	.0005	71		

Table 21. The Cross-tabulation of Relative Regressivity by Household Income

Household Income	Under \$5000	\$5000 \$10,000	\$10,000 \$15,000	\$20,000 \$30,000	\$30,000 \$50,000	Total
Regressivity						
-.25	0	1	0	1	6	7 32.6%
-.5	0	1	0	1	3	5 21.6%
-.75	0	1	2	0	3	6 28.9%
-.9	1	0	0	1	0	2 9.6%
-1.0	0	1	0	0	1	2 7.3%
Column Total	1 6.0%	3 14.7%	2 9.6%	3 13.3%	13 56.4%	22 100.0%

<u>Chi-Square</u>	<u>D.F.</u>	<u>Significance</u>	<u>Pearson's R</u>	<u>Significance</u>
24.188	16	.0855	-.39995	.0316

Table 22. The Cross-tabulation of Diagnostic "Hard" Signs
by the Clinical Signs Test

Diagnostic Signs	No Score	Score	Total
CUN PIVFH Scores			
1	80	0	80 55.8%
2	39	0	39 27.5%
3	10	1	11 7.7%
4	5	5	10 7.1%
5	1	1	3 1.9%
Column Total	135 94.4%	8 5.6	143 100%

Table 23. The Cross-tabulation of the Cumulative Clinical Signs Test by Low Scorers on the Diagnostic Test

Cum Clinical Scores	Diagnostic Test		Row Total
	0	1	
0	160	10	170 87.8%
1	5	19	24 12.2%
Column Totals	165 85.0%	29 15.0%	194 100.0%

TABLE 24. COMPARISON OF THE ISR AND CLINICAL SIGNS MODELS.

ISR
OBSERVED

"AT-RISK"

(PROBABILITY-OF-INCLUSION LEVEL=.2)

CASES	%SAMPLE
21	2.62

PROBABLE

POTENTIAL

OTHER

CASES
3.36

CASES
5.67

CASES
12.0

%SAMPLE
.42

%SAMPLE
.71

%SAMPLE
1.49

CLINICAL
OBSERVED

"AT-RISK"

(PROBABILITY-OF-INCLUSION LEVEL)=.2)

CASES	%SAMPLE
47	5.86

PROBABLE

POTENTIAL

DIAGNOSABLE

CASES
12

CASES
27

CASES
8

%SAMPLE
1.498

%SAMPLE
3.37

%SAMPLE
.998

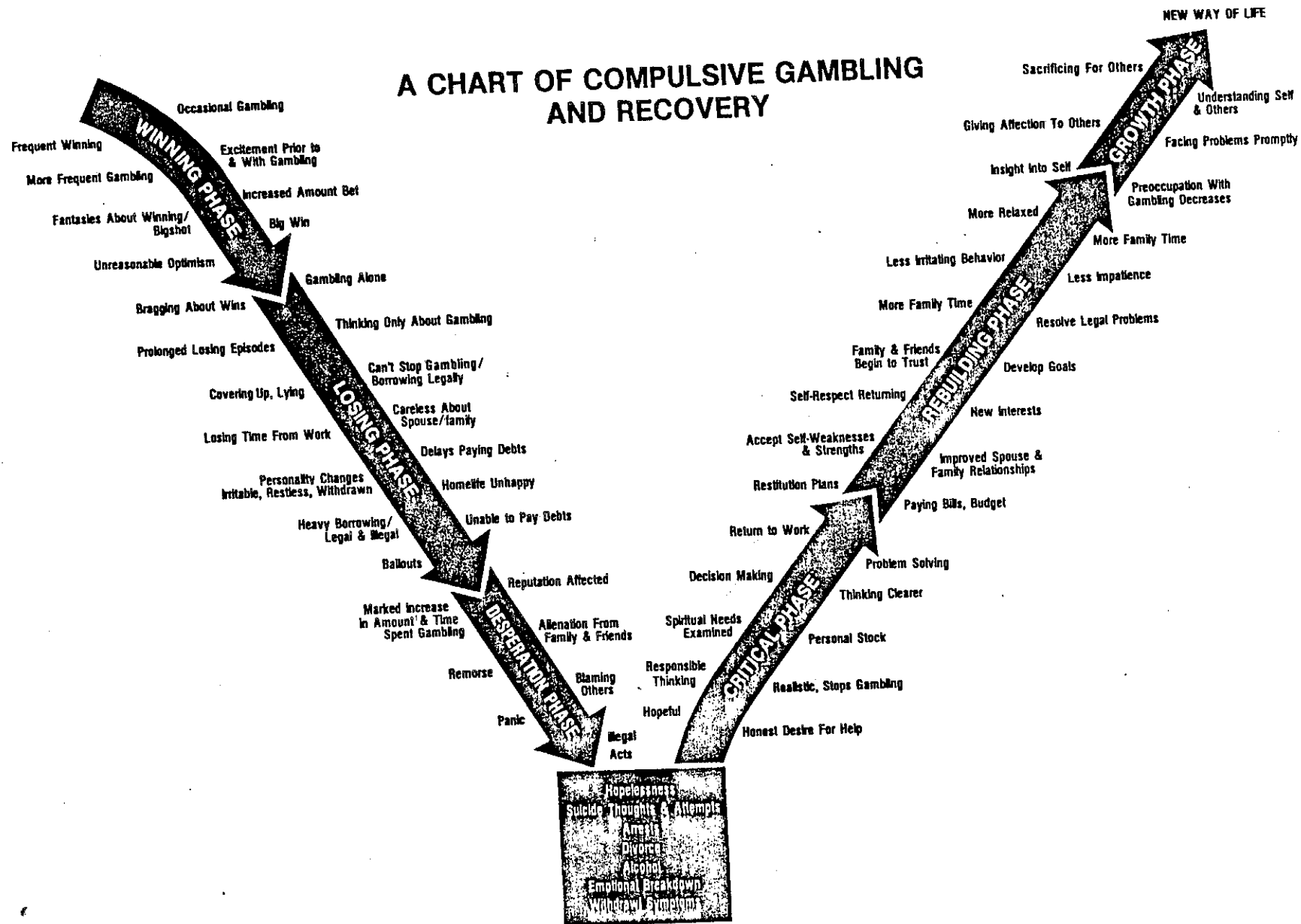
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APPENDIX A

A CHART OF COMPULSIVE GAMBLING AND RECOVERY



APPENDIX B

1.
LEISURE TIME PURSUITS

•Identifies

2.

DISCRIMINANT VARIABLES TESTING: (A) ISR VARIABLES, (B) THE CUSTER SOFT SIGNS

Gamblers

•Gamblers and

Non-Gamblers

•Identifies

•Only Those

Non-Gamblers

Items which

•Gambling

do Not

Mentioned

Mention

Gambling, and

Amidst

which are not

List of

sensitive.

Other Pursuits

•Uses P.I.V.F.L.

•Establishes Comparable "At Risk" Pool, but only Partially.

3.

Discriminant Variables:

(A) ISR (B) Custer Soft Signs

•Gamblers Only

•Uses P.I.V.F.L.

•Items which do mention

gambling and which

are not sensitive.

•Establishes Comparable

"At Risk" Pool.

•Distinguishes Three Grades of Social Gamblers.

4.

Gambling Behavior: Gamblers Only

•Focuses on Amount
and Characteristics
of Gambling in 1983.

•Distinguishes Three
Types of Social
Gamblers.

•Income Variables: Total Net Personal

5. Diagnostic Criteria

•Gamblers Only

•P.I.V.F.L.

•Hard Signs

•Sensitive

Variables.

•Identifies: Sex, Age, Education, Occupation, Residency, Ethnicity/Race.

1.
LEISURE TIME PURSUITS

•Identifies

Gamblers

•Identifies

Non-Gamblers

•Gambling

Mentioned

Amidst

List of

Other Pursuits

2.

DISCRIMINANT VARIABLES TESTING: (A) ISR VARIABLES, (B) THE CUSTER SOFT SIGNS

•Gamblers and

Non-Gamblers

•Only Those

Items which

do Not

Mention

Gambling, and

which are not

sensitive.

•Uses P.I.V.F.L.

•Establishes Comparable "At Risk" Pool, but only Partially.

3.

INFORMANT VARIABLES: G.A. TEST

•Based upon Gamanon and Gamateen Questions.

•From Least Sensitive to Sensitive.

•Income Variables.

•Identifies: Sex, Age, Education, Occupation, Residency, Ethnicity/Race.

Appendix C

Record Phone Number _____ / _____ - _____

Record FIP Code 39 _____

RESPONDENT SCREENER & SELECTION GUIDE

INTRODUCTION: Hello, my name is _____ and I am calling for Decision Research Corporation. Tonight we are calling people in the State of Ohio about leisure activities and we'd really appreciate your cooperation. May I have a few minutes of your time? *

In order to determine which person in your household I should interview, I need to ask you two questions (see Version Circled).

Q#1. How many people 18 years old or older live in your household, counting yourself?

Circle response at checkpoint on pink page).

Q#2. How many of them are men?

According to our random selection procedures I need to talk to the (proper respondent) in your household? Is that person home?

(If Not) What time can I call back speak to that member of your household?

Who should I ask for?

Yes, can that member of your household come to the phone? (Repeat Introduction to proper respondent)

VERSION I

Number of adult men	Total number of adults in household			
	1	2	3	4 or more
0	Woman	Oldest woman	Youngest woman	Youngest woman
1	Man	Man	Man	Oldest woman
2		Oldest man	Youngest man	Youngest man
3			Youngest man	Oldest man
4+				Oldest man

VERSION II

Number of adult men	Total number of adults in household			
	1	2	3	4 or more
0	Woman	Youngest woman	Youngest woman	Oldest woman
1	Man	Man	Oldest woman	Man
2		Oldest man	Woman	Oldest woman
3			Youngest man	Woman or oldest woman
4+				Oldest man

VERSION III

Number of adult men	Total number of adults in household			
	1	2	3	4 or more
0	Woman	Youngest woman	Oldest woman	Oldest woman
1	Man	Woman	Man	Youngest woman
2		Youngest man	Oldest man	Oldest man
3			Oldest man	Youngest man
4+				Youngest man

VERSION IV

Number of adult men	Total number of adults in household			
	1	2	3	4 or more
0	Woman	Oldest woman	Oldest woman	Youngest woman
1	Man	Woman	Youngest woman	Man
2		Youngest man	Woman	Youngest woman
3			Oldest man	Woman or youngest woman
4+				Youngest man

If Respondent asks how long it will take say about 10 minutes.

Time Check:

Section I. Leisure

First of all, I'd like to read you a list of ways that some people spend their spare time. Please tell me if you frequently, sometimes, or never spend your spare time in these ways.

	<u>Frequently</u>	<u>Sometimes</u>	<u>Never</u>	<u>Don't Know</u>
1. Playing games at home with family.	1	2	3	9
2. Socializing with friends at a club or party.	1	2	3	9
3. Going out for entertainment.	1	2	3	9
4. Playing games for money, or betting on the outcome of games, events, or drawings. (Circle response at checkpoint on pink page)	1	2	3	9
5. Participating actively in sports.	1	2	3	9
6. About how much money do you usually allow each month for recreation? (Record exact amount below, then circle appropriate category. Read categories <u>only if</u> respondent hesitates in giving exact amount.)	01	Under \$20		
	02	\$ 21 - \$ 30		
	03	\$ 31 - \$ 40		
	04	\$ 41 - \$ 50		
	05	\$ 51 - \$ 60		
	06	\$ 61 - \$ 80		
	07	\$ 81 - \$ 100		
	08	\$ 101 - \$ 150		
	09	\$ 151 - \$ 200		
	10	\$ 201 - \$ 500		
	11	Over \$500		
	12	Don't Know/Refused		
\$ _____				
7. Are you..... (Read List)	1	Single		
	2	Married		
	3	Separated		
	4	Divorced		
	5	Widowed		
	9	Refused (Do Not Read)		
8. What is the last year of school you completed?	1	Graduate Grammar School (grades 1-8)		
	2	Attend High School		
	3	Graduate High School		
	4	Attend College		
	5	Graduate College		
	6	Attend Graduate School		
	7	Graduate, Graduate School		
	9	Refused		
9. Are you a black or white American?	1	Black		
	2	White		
	3	Other (Specify) _____		
	9	Refused		

10. And, what is your religion? Are you Catholic, Protestant or Jewish?

- 1 Catholic
- 2 Protestant
- 3 Jewish
- 4 Other(specify) _____
- 5 None
- 9 Refused

11. Which of the following best describes your work status.....

(Read List)

(If respondent says self-employed, ask if full-time or part-time)

- 1 Full-time (30 hrs + per week)
- 2 Part-time (4-30 hrs. per week)
- 3 Houseperson
- 4 Student
- 5 Retired
- 6 Not Working
- 7 Other _____
- 9 Refused (Do Not Read)

12. Into which of the following age groups do you fall.....

(Read List)

- 1 18 to 34
- 2 35 to 49
- 3 50 to 64
- 4 65 and over
- 9 Refused (Do Not Read)

Section II. Discriminant Variables Testing, Gamblers and Non-Gamblers

Now I'd like to read you a series of statements. For each one please tell me if the statement is true or false for you. The first one is.....

	<u>True</u>	<u>False</u>	<u>Don't Know</u>
. Sometimes at elections I vote for candidates about whom I know very little.	1	2	9
. Once in a while I put off until tomorrow what I ought to do today.	1	2	9
. I do not always tell the truth.	1	2	9
. I generally feel it is best to be cautious and conservative with my money.	1	2	9
. I would be willing to invest my money in a new uranium mining venture.	1	2	9
. I would never put all my money into a venture, even though the potential profits were great.	1	2	9
. I feel that money is to be used, not saved.	1	2	9
. Sometimes I try to avoid conflicts by lying.	1	2	9
. I like, and sometimes even admire, people who take risks.	1	2	9
. From the time I was 16, I have had a permanent home.	1	2	9
. My employer has been distressed by my absence from work.	1	2	9
. I have frequently been unemployed.	1	2	9
. I have never held a job for longer than 2 years.	1	2	9

Next, I'd like to read you a list of words which are often used to describe people. Please tell me if these words describe you very well, somewhat, not very well or not at all. How would you say... describes you, very well, somewhat, not very well, or not at all.

	<u>Very Well</u>	<u>Somewhat</u>	<u>Not Very Well</u>	<u>Not At All</u>	<u>Don't Know</u>
15. Conventional	1	2	3	4	9
16. Careless	1	2	3	4	9
17. Good Natured	1	2	3	4	9
18. Irresponsible	1	2	3	4	9
19. Anxious	1	2	3	4	9
20. High Energy	1	2	3	4	9
21. Workaholic	1	2	3	4	9
22. A Poor Participant in things you Organize	1	2	3	4	9
23. An Initiator	1	2	3	4	9

The next two statements describe how people feel. Please tell me if you strongly agree, agree, disagree or strongly disagree with each statement. The first one is.....

	<u>Strongly Agree</u>	<u>Agree</u>	<u>Disagree</u>	<u>Strongly Disagree</u>	<u>Don't Know</u>
24. People were better off in the old days when everybody knew how they were supposed to act.	1	2	3	4	9
25. I guess I put on a show to impress people, I know I'm not the person I pretend to be.	1	2	3	4	9

Now I'm going to read you a pair of statements which are opposites. Please tell me how much you feel like the first statement or the second statement on a scale from one to nine. That is, if you feel exactly like the first statement, say one. If you feel exactly like the second statement, say nine. If you are somewhere in between, say the number between one and nine that tells me how you feel. (After reading statements, review instructions, if unclear.)

		<u>Don't Know</u>
26. I am concerned about getting hurt. or I enjoy an element of physical danger.	1 2 3 4 5 6 7 8 9	0
27. I am careful to avoid any behavior which might compromise my ethical standards. or I am flexible about standards of behavior even if there is some risk.	1 2 3 4 5 6 7 8 9	0

Page 6.

Interviewer Checkpoint

Circle number of adults in household from screener sheet.
1 2 or more

Circle response to Question 4 on Page 1, frequency of playing games for money.

<u>Frequently</u>	<u>Sometimes</u>	<u>Never</u>	<u>Don't Know</u>
1	2	3	9

Gambler/Non Gambler
Question 4, Page 1

Number of Adults in Household

Screener Sheet

Frequently

Never

or

or

Sometimes

Don't Know

1 person only

Skip to Blue
Section, Page 9

Skip to Yellow Page
Ask Q20 only and
then conclude

2 or more persons

Skip to Blue
Section, Page 9

Continue
on to Green Section

Section III. A: For Non-Gamblers Only

1. Now I'd like for you to name three leisure time activities of other members of your household. (Record answer verbatim, then code each item either 1, for gambling related activities or 0, for all other activities.)

	<u>Gambling Related</u>	<u>All Other</u>
_____	1	0
_____	1	0
_____	1	0

2. Would you say that other members of your household frequently, sometimes or never participate in games of chance for money, or bet on the outcomes of games, events or drawings.?

1 Frequently (Continue)
 2 Sometimes (Continue)
 3 Never (Skip to yellow
 9 Don't Know page ask Q20
 & 21 and conclude)

3. How many people in your household frequently or sometimes participate in these games of chance for money?

4. And what are their relationships to you?
 (Complete up to four relatives.)
 (If respondent mentions only 1 person, skip Q5 and go to Q6)

1	1	1	1	Husband
2	2	2	2	Wife
3	3	3	3	Father
4	4	4	4	Mother
5	5	5	5	Brother
6	6	6	6	Sister
7	7	7	7	Son
8	8	8	8	Daughter
9	9	9	9	Other _____
0	0	0	0	None

Page 8.

5. Which person in your household seems to engage in such pastimes the most?

1 Husband
2 Wife
3 Father
4 Mother
5 Brother
6 Sister
7 Son
8 Daughter
9 Other (specify) _____

6. Is (he/she) very involved, somewhat involved or not very involved with games of chance?

1 Very Involved
2 Somewhat Involved
3 Not Very Involved
9 Don't Know

	<u>Yes</u>	<u>No</u>	<u>Don't Know</u>
7. Has (his/her) involvement ever caused you or your household to fall behind on a regular monthly payment such as rent or mortgage, telephone, utility or credit payments?	1	2	9
8. Has (he/she) ever asked you to bail (him/her) out of a debt related to this involvement or to cover up with a bill collector?	1	2	9
9. Have you encountered legal difficulties related to (his/her) involvement?	1	2	9
10. Have you ever felt negatively toward (his/her) gambling, and asked (him/her) to stop?	1	2	9
11. Does (he/she) ever assure you that (he/she) is going to quit, but then continue?	1	2	9
12. Do you feel that your lives together are becoming unhappy due to (his/her) gambling?	1	2	9

(Skip to yellow page. Ask Questions 20 and 21 and conclude.)

Section III. B: Discriminant Variables Testing - Gamblers Only

Next I'm going to read you a series of statements. For each one please tell me if the statement is true or false for you. The first one is.....

	<u>True</u>	<u>False</u>	<u>Don't Know</u>
1. When playing a game, I would rather play for money.	1	2	9
2. When I gamble, I would rather "go for broke" than "play it safe".	1	2	9
3. When I bet, the higher the stakes, the more I enjoy the bet.	1	2	9
4. After losing, I feel that I have to return to gambling as soon as possible and win back my losses.	1	2	9
5. Sometimes, when I gamble, and I have been losing, afterwards, I feel a sense of remorse.	1	2	9
6. After a win, I have a strong urge to return and win more.	1	2	9
7. Sometimes, I gamble in order to escape worry or trouble.	1	2	9
8. Since I started gambling, I seem to be less efficient at other things I do, and less ambitious.	1	2	9
9. Sometimes an argument, disappointment or frustration creates inside of me an urge to gamble.	1	2	9
10. For me, gambling is more important than social activities.	1	2	9
11. I have lost time from work on occasion, due to gambling	1	2	9
12. Gambling has affected my reputation.	1	2	9
13. Gambling sometimes makes me feel like a "bigshot," or somebody others look up to.	1	2	9
14. I have a special loyalty to bookies, not out of fear, but out of personal or business regard.	1	2	9
15. Gambling had a bad effect on my performance in school.	1	2	9
16. I am sometimes reluctant to use gambling money for normal expenses.	1	2	9
17. I have financed gambling either by pawning family jewelry, or selling off personal or real property.	1	2	9
18. I have occasionally borrowed or taken money even though I had my own money to bet.	1	2	9

	<u>True</u>	<u>False</u>	<u>Don't Know</u>
19. I have gambled in order to get money with which to pay debts or otherwise solve financial difficulties.	1	2	9
20. When paying off a debt with gambling winnings, I will keep a reserve for gambling.	1	2	9
21. Sometimes I brag about winning money from gambling even though I actually lost.	1	2	9
22. Occasionally, I have failed to meet basic family needs, such as food, clothing or other household expenses due to gambling.	1	2	9
23. At what age did you first win or lose \$20?	1	over 21	
	2	16 to 21	
	3	10 to 15	
	4	Less than 10	
	5	Never	
	9	Don't Know	

Section IV: Gambling Behavior - Gamblers Only

Now I'd like to read you a list of games on which people frequently bet money. For each one please tell me if you bet money on these games in 1981. The first one is.....

Did you bet money on.....in 1981?

(If the respondent says yes to any of the games, ask the following 2 questions for each game respondent says yes to.)

A. About how many times did you bet money on.....in 1981 (1984) less than once a month, at least once a month, or at least once a week? (PROBE)

If less than once a month ask:
How many times during the year did you bet money?

If at least once a month ask:
How many times a month did you bet money?

If at least once a week ask:
How many times a week did you bet money?

B. What was the amount of money you usually spent betting on.....on a typical occasion in 1981 (1984)? (Probe for exact amount)

(Regardless of how respondent answered the first question for each of the games, ask the same question for 1984.) Say.....

And did you bet money on.....in 1984?

(If respondent says yes repeat Questions A and B above for 1984.)

		<u>Bet Money</u>			<u>Number of Times</u>				<u>Don't Know/Refused</u>	<u>Amount Spent</u>
		<u>Yes</u>	<u>No</u>	<u>Don't Know</u>	<u>Less than Once A Month times per year</u>	<u>At Least Once A Month times per month</u>	<u>At Least Once A Week times per week</u>			
1. Horse racing at the track	1981	1	2	9	_____	_____	_____		00	_____
	1984	1	2	9	_____	_____	_____		00	_____
2. Other sporting events while you were at those events, such as football or baseball games.	1981	1	2	9	_____	_____	_____		00	_____
	1984	1	2	9	_____	_____	_____		00	_____

			<u>Bet Money</u>			<u>Number of Times</u>				<u>Amount Spent</u>
			<u>Yes</u>	<u>No</u>	<u>Don't Know</u>	<u>Less than Once A Month times per year</u>	<u>At Least Once A Month times per month</u>	<u>At Least Once A Week times per week</u>	<u>Don't Know/Refused</u>	
3.	The Ohio Lottery	1981	1	2	9	_____	_____	_____	00	_____
	or other State	1984	1	2	9	_____	_____	_____	00	_____
	lotteries.									
4.	Games at the casino									
	in Las Vegas or									
	Atlantic City like									
	cards, dice and slot	1981	1	2	9	_____	_____	_____	00	_____
	machines.	1984	1	2	9	_____	_____	_____	00	_____
5.	Casino games here in									
	Ohio like those for	1981	1	2	9	_____	_____	_____	00	_____
	schools or charity.	1984	1	2	9	_____	_____	_____	00	_____
6.	Games you play at									
	home or with	1981	1	2	9	_____	_____	_____	00	_____
	friends; like	1984	1	2	9	_____	_____	_____	00	_____
	cards.									
7.	Bingo	1981	1	2	9	_____	_____	_____	00	_____
		1984	1	2	9	_____	_____	_____	00	_____
8.	Poker Machines	1981	1	2	9	_____	_____	_____	00	_____
		1984	1	2	9	_____	_____	_____	00	_____
9.	Office pools like	1981	1	2	9	_____	_____	_____	00	_____
	those for football	1984	1	2	9	_____	_____	_____	00	_____
	or baseball games.									
10.	Horse racing	1981	1	2	9	_____	_____	_____	00	_____
	with a bookie.	1984	1	2	9	_____	_____	_____	00	_____

Bet Money

Number of Times

		<u>Yes</u>	<u>No</u>	<u>Don't Know</u>	<u>Less than Once A Month times per year</u>	<u>At Least Once A Month times per month</u>	<u>At Least Once A Week times per week</u>	<u>Don't Know/ Refused</u>	<u>Amount Spent</u>
. Sports cards, or sheets, with a bookie	1981	1	2	9	_____	_____	_____	00	_____
	1984	1	2	9	_____	_____	_____	00	_____
. Numbers or policy.	1981	1	2	9	_____	_____	_____	00	_____
	1984	1	2	9	_____	_____	_____	00	_____

Are there any other games or events that you bet money on which I did not mention? If yes, what are they? (Repeat series of questions for 1981 and 1984 for each of the additional games mentioned)

3. _____	1981	1	2	9	_____	_____	_____	00	_____
	1984	1	2	9	_____	_____	_____	00	_____
4. _____	1981	1	2	9	_____	_____	_____	00	_____
	1984	1	2	9	_____	_____	_____	00	_____

15. Of all the games mentioned which is your favorite?
(Record game number from list 1-14. If none, enter 0.)

16. At the end of 1984, had you won money, lost money or broke even?

- 1 Won (17)
- 2 Lost (17)
- 3 Broke Even (18)
- 9 Don't Know (18)

17. How much money was that?
(Record exact amount below then circle appropriate category. Read categories only if respondent hesitates in giving exact amount)

\$ _____

- 1 Under \$25
- 2 \$ 26 to \$ 100
- 3 \$ 101 to \$ 500
- 4 \$ 501 to \$ 1,000
- 5 \$ 1,001 to \$ 5,000
- 6 \$ 5,001 to \$ 10,000
- 7 \$10,001 to \$ 20,000
- 8 \$20,001 to \$ 50,000
- 9 \$50,001 or more
- 0 Refused/Don't Know

18. In 1985, do you think that you will spend more money, spend less money or spend about the same amount of money on these games as you did in 1984?

- 1 Spend More
- 2 Spend Less
- 3 Same Amount
- 9 Don't Know

19. About how much money do you think you will spend in 1985? (Record exact amount below, then circle appropriate category. Read categories only if respondent hesitates in giving exact amount.

\$ _____

- 1 Under \$25.
- 2 \$ 26 to \$ 100
- 3 \$ 101 to \$ 500
- 4 \$ 501 to \$ 1,000
- 5 \$ 1,001 to \$ 5,000
- 6 \$ 5,001 to \$ 10,000
- 7 \$10,001 to \$ 20,000
- 8 \$20,001 to \$ 50,000
- 9 \$50,001 or more
- 0 Refused/Don't Know

20. Into which of the following income groups does your personal yearly income fall..... (Read list)

- 1 Less than \$ 5,000
- 2 \$ 5,001 to \$ 10,000
- 3 \$ 10,001 to \$ 15,000
- 4 \$ 15,001 to \$ 20,000
- 5 \$ 20,001 to \$ 30,000
- 6 \$ 30,001 to \$ 50,000
- 7 \$ 50,001 or more
- 9 Don't Know/Refused/ (Do Not Read)

(Do Not Ask Question 21 if a One person household.)

(Conclude interview if you skipped here from checkpoint. Say: This is the end of our study. Thank you for your time.)

21. And what is the total yearly income of your household..... (Read list)

- 1 Less than \$ 5,000
- 2 \$ 5,001 to \$ 10,000
- 3 \$ 10,001 to \$ 15,000
- 4 \$ 15,001 to \$ 20,000
- 5 \$ 20,001 to \$ 30,000
- 6 \$ 30,001 to \$ 50,000
- 7 \$ 50,001 or more
- 9 Don't Know/Refused (Do Not Read)

(If respondent has completed Blue pages, go on to next page).

(Conclude interview if you skipped here from Green section. Say: this is the end of our study. Thank you for your time.)

Section V. Diagnostic Criteria and Other "Hard Signs."

(Gamblers Only)

Now I'd like to ask you one last series of questions. Just answer these questions yes or no.

	<u>Yes</u>	<u>No</u>	<u>Don't Know</u>
1. Did you ever have a big win equal to one month's salary or more?	1	2	9
2. Did you ever borrow money, from legal or other sources, in order to finance gambling?	1	2	9
3. Have you ever defaulted on a loan, or fallen behind on a regular monthly payment such as housing or consumer credit due to gambling?	1	2	9
4. Have you ever been bailed-out of a gambling debt by your spouse, your parents, friends or anyone else?	1	2	9
5. Has your gambling made you or your family quarrelsome at home, or made your homelife unhappy in any other way?	1	2	9
6. Has gambling caused you to become careless of your family?	1	2	9
7. Has your gambling caused problems for your spouse or your children?	1	2	9
8. Did you ever commit or consider committing an illegal act, such as forgery, fraud, embezzlement, or tax evasion in order to finance gambling?	1	2	9

(Conclude interview. Say: This is the end of our study. Thank you for your time).

