

Problem Gambling and Policy Advice: The Mutability and Relative Effects of Structural, Associational and Attitudinal Variables

Joseph Hraba, Ph.D.
Gang Lee
Iowa State University

Research on gambling has the double mandate of public service and the advancement of science. This paper is meant to carry forward that mandate. Latent in research on the causes of problem gambling is the policy insight that these causes represent different types of phenomena and are unequally mutable to practitioners' efforts to prevent and/or treat problem gambling. By making the issue of mutability manifest in research, findings from research would have more policy relevance and practical import. Data from a 1989 Iowa survey on lottery play and problem gambling are analyzed to illustrate this point. 1,226 respondents were contacted by phone and phone interviews were completed with 1,011 of these 1,226 eligible respondents. With multiple regression, we assessed the contributions of mutable and immutable variables to the explained variance in problem gambling. The results show mutable correlates explain enough variance in problem gambling to recommend their consideration in treatment/prevention. The results also suggest a social as well as a psychological etiology to problem gambling. Future research should, however, do a more complete comparison of social and psychological causes of problem gambling.

This research was partially supported by the Iowa Department of Human Services and the National Institute of Mental Health (1 R01 MH50369-01A1). The authors wish to thank Willis Goudy, anonymous readers and the editor of this journal for helpful comments.

Send reprint requests to Joseph Hraba, Department of Sociology, Iowa State University, Ames, Iowa 50011.

INTRODUCTION

Gambling as a Policy Issue

The diffusion of gambling in recent years raises several policy issues, and this is particularly true for state-sponsored lotteries (Clotfelter, 1979; Clotfelter & Cook, 1989; Livernois, 1987; Spiro, 1974; Suits, 1977; Vaillancourt & Grignon, 1988). One issue is state lotteries might bring an increase in problem gambling and thus state expense to treat it (e.g., Abt, Smith & Christiansen, 1985; Sommers, 1988; Jacobs, 1989). Some interest groups put this into a larger context of the moral decay of the country and create an alarming picture. The nation has 97 million lottery players, who can be seen mobbing ticket outlets to have a chance at big winnings in multi-million dollar jackpots (Wells, 1989). Are these 97 million people at risk of becoming problem gamblers? One claim is that through sponsorship and media advertising of gambling, states are legitimizing gambling and motivating the public into it. Furthermore, the availability of all forms of gambling, not only lotteries, has been growing in most states during recent years. Gambling could become more acceptable, actual gambling could grow and spread to children, and for two to ten percent of the population this could lead to problem gambling with another ten to 15 percent betting more than they can afford (Wells, 1989).

Problem gambling is defined in the psychiatric literature as pathological or compulsive gambling, a disorder of impulse control. According to this medical model, problem gambling is thought to be a progression into more gambling and heavier wagering, resulting in a loss of control over gambling and the eventual disruption of one's life (Bergler, 1958; Hraba, Mok & Huff, 1990; Kallick, Suit, Dielman & Hybels, 1979; Lesieur, 1977; Moran, 1975; Orford, 1985; Winston & Harris, 1984). Compulsive gamblers chase old betting losses with new wagers, trying to get even, a possible dynamic behind the spiral into problem gambling (Lesieur, 1979).

Latent in theory and research on gambling is the practical insight that causes of problem gambling, including lottery play, are unequally mutable to practitioners' efforts. Practitioners can exercise some control over mutable but not immutable correlates of problem gambling (see below). If the issue of mutability were made manifest in research, practitioners would find it easier to translate research findings into

their applied effort, be it preventive or therapeutic. This paper is meant to illustrate this point with 1989 data collected for the state of Iowa to assess if a state lottery was engendering problem gambling (Hraba, 1989).

Causes of Gambling and Problem Gambling

Past research has found consistent connections between problem gambling and other variables. The correlates of gambling include numerous economic and social characteristics, such as race and ethnicity, age, occupation, education, income, religion, residence, marital status, and armed forces service. Early and current exposure to gambling; leisure pursuits, including spending styles; and personality traits are also correlates of gambling (Bergler, 1958; Sommers, 1988; Frey, 1984; Hraba et al., 1990; Kallick et al., 1979; Lesieur, 1979; Lieberman, 1988; Mok & Hraba, 1991; Moran, 1975; Orford, 1985; Rosecrance, 1986; Transition Planning Associates, 1985; Winston & Harris, 1984). The illusion of control as an attitude about gambling may be another cause of problem gambling (Langer, 1983; Rosecrance, 1986). In addition, research has suggested that state lotteries are a possible cause of problem gambling (Culleton & Lang, 1985; Hraba et al., 1990). Although the correlates of problem gambling challenge any ease theorizing, they can be categorized by type of phenomena, and types of phenomena offer the insight of unequal mutability to practitioners' efforts.

Types of Phenomena and Mutability

Some causes of problem gambling refer to social structure, some to associations, and others to attitudes and personality states. The possible causes studied in this paper by these three classes of phenomena are found in Table 1. Under normal policy guidelines, these different types of causes are unequally mutable to practitioners' efforts to prevent or stop problem gambling by noninstitutionalized gamblers.

The mutability of the causes of problem gambling hinges on the intersection of two considerations. One is their class of phenomena and the other is the likely latitude a practitioner will have in doing something about both these causes as well as consequences of problem gambling. Social structural causes are most difficult for practitioners to

Table 1
Independent Variables by Type of Phenomena

<i>Social Structure</i>	
Childhood exposure to gambling	Respondent characteristics
Community size	Age
Home ownership	Ethnicity
Residential mobility	Gender
Marital status	Employment
Number of adults in the household	Education
	Income
	Financial status
	Religion
	Church attendance
	Armed Forces service
<i>Associations</i>	
Lottery Play	Watch sports
Money spent on Lottery Play	Money spent on leisure past week
Current exposure to gambling	
Alcohol consumption	Team lottery play
<i>Attitudes and Individual Traits</i>	
Personality traits	Gambling attitudes
Civic personality	
Self-centered personality	
Competitive personality	
Big-spender	
Impulsive	

change. The facts of race, age, gender, and so on are immutable, for the most part, despite rare cases of gender change and race passing. Certainly, policy makers and practitioners will not have the mandate to change gamblers' gender and race to prevent or treat their problem gambling. This same limitation applies to a gambler's age, residence, formal education and occupation, and even past experiences, such as childhood exposure to gambling. Role expectations articulated with structural statuses may change, but these changes are coterminous with the impact of associations and attitudes on problem gambling.

State lotteries may be a social structural variable from the perspective of individual gamblers. They were made available to the public without its direct consent, although public consent was implied in a representative democracy. Nor can any one gambler or practitioner change the availability of state lotteries. In this way, lotteries are an immutable, structural variable. In other ways, state lotteries represent associational variables. Each gambler volunteers to play the lottery, no one is coerced into lottery play, and thus play represents a voluntary association. Lottery play will be treated as an associational variable in this research.

Policy makers and practitioners can and often are expected to alter problem gamblers' associations and attitudes. Gamblers cannot be coerced into new associations and attitudes, but the practitioner can offer alternatives to be taken on a voluntary basis. For example, leisure pursuits associated with gambling, from running around with other gamblers to being a big drinker, can be a target for practitioners' efforts. By the same token, attitudes and even traits of gamblers are routinely the object of counseling and preventive programs, although psychologists might argue that personality traits are so hard to change as to be practically immutable. From a sociological perspective, our argument is that practitioners have less latitude in changing gender, age, religion, and even people's education, employment and income (social structure) than doing something about gamblers' associations and attitudes. Counseling about new attitudes toward gambling is an illustration.

Whereas social structural causes of gambling are virtually immutable to practitioners' efforts, associational and attitudinal causes are more mutable. As compared with immutable structural ones, do these more mutable causes explain enough variance in gambling to suggest that intervention into their impact on problem gambling would be preventive and/or therapeutic?

METHODS

Sample

The sample is a stratified random selection of working household telephone numbers in the state of Iowa in 1989. A master list of 2,000 telephone numbers was obtained from the Survey Sampling, Inc., and

was a computer-based listing of all residential telephone numbers in the state. This listing was stratified by counties, and the telephone numbers provided for each county were proportional to its population size relative to that of the entire state. This procedure assured a statewide distribution of respondents and protected the anonymity of respondents, for no names were known to the interviewers. Our target was to interview household members at a random 1,000 of these telephone numbers because of budget constraints, but we actually contacted 1,226 potential respondents. Another 49 households were contacted but the selected respondents in these household could not be interviewed within the time frame of the study. Other household members said that the selected respondents were away from home on each call-back. The interviews were conducted April-June, 1989.

When a household was contacted by telephone, interviewers determined the number of adult female and male household members (18 years or older), selected a respondent in accord with random selection tables, and did not allow substitutions. This procedure circumvents any bias in who typically answers the phone at home. If the selected respondent was not at home, a call-back was arranged. In cases where respondents were difficult to catch at home, the design included a minimum of seven potential call-back attempts.

Interviews were completed with 1,011 of the eligible respondents actually contacted (1,226), representing a response rate of 82 percent. 215 refused to be interviewed. If the additional 49 who could not be contacted are added to the base ($N = 1,275$), then the response rate would be 79 percent. Over 70 percent (72.8%, $n = 736$) of the respondents reported gambling of some sort, including lottery play. The gambling subsample is the focus of this research.

Interview Guide

After an introduction and screening of household members, interviewers asked a series of questions about lottery play. The questions were about lottery play in the past seven days, lottery play since the inception of the Iowa lottery, wagering on the lottery in a typical week, how the lottery is played, when lottery play is most likely, the attribution of chance and/or skill to lottery play, and reasons for lottery play. Respondents who indicated lottery play and/or other forms of gambling in the past six months were asked a series of question about their

gambling. The remainder of the interview guide included questions on hypothesized causes of problem gambling found in Table 1.

Problem Gambling

Problem gambling was considered to be a progression into more frequent and heavier gambling, a loss of control over gambling, and a consequent disruption of routine and normal life. Fourteen questions about gambling, control over it, and its consequences were asked of the gambling respondents. The component items of gambling behavior are leisure time spent gambling, frequency of gambling since the new year, money bet at one time since the new year, and types of gambling in the past year. The component items of loss of control are gamble more money or longer periods than intended, return to gambling as soon as possible, unable to resist gambling, and hide gambling from loved ones. The items to gambling consequences are borrowed money to gamble or pay gambling debts since the New Year, lost time from work or school due to gambling since the New Year, recently criticized for gambling, recently tried to stop gambling, considered an illegal action to pay for gambling since the New Year. Most of these items were adopted from the South Oaks Gambling Screen (cf., APA, 1980; 1987; Lesieur & Blume, 1987; Volberg & Steadman, 1988). However, no validity checks for the items in this study exist.

Scores on all 14 items were standardized because of differences in number of response categories across items. In an earlier study, these phases of problem gambling were found to be a progression from gambling behavior through loss of control and finally gambling consequences (Hraba et al., 1990). In this study, the 14 items were combined into a single scale of problem gambling ($\alpha = .73$).

Gambling Causes

Structural Phenomenon. Possible gambling causes were first categorized by type of phenomenon (Table 1). The structural data collected on respondents are basic demographic characteristics and/or known correlates of problem gambling. Except for armed forces service, gender, employment, ethnicity, home ownership, marital status, and religion, these variables are scored continuously from low to high

(see Table 2). Number of adults at home is the actual number of people 18 years or older living in respondents' households. Financial status is a composite score of three items on ownership of stocks, bonds, and rental property. Personal yearly income is coded into six categories from less than \$5,000 to more than \$100,000. The time reference for residential mobility is the past five years. Protestant and Catholic are both coded as zero for not being either and one for being either a Protestant or Catholic. Codes for the other structural variables are found in Table 2.

While church attendance, childhood exposure to gambling and even armed forces service seem to be associational variables, we considered them to be immutable structural states. To prevent or treat problem gambling, practitioners do not often have the mandate to even ask gamblers to stop/start going to church or change churches, and what can be done about past experiences of childhood exposure to gambling?

Associational Phenomena. The associational data collected are found in Tables 1 and 3. The component items of lottery play are number of instant games and lotto tickets that respondents played in the past week, as well having played the lottery in the more distant past. Team lottery play means a respondent shared strategies and played the lottery with others. The items include talking with others about strategies to win, pooling money with others, picking numbers with others, and sharing tickets and splitting any winnings. Money spent on leisure is coded in actual dollars, as is money spent on lottery play in a typical week. The inclusion of several items on lottery play is due to the original objective of this research. The codes to the other associational variables are in Table 3.

Attitudinal Phenomena. The attitudinal data shown in Table 1 include respondents' attitudes about gambling and their personality traits. Gambling attitude is a composite score of four items asking about consulting astrological charts, keeping track of winning lotto numbers, selecting own numbers, and feeling that lotto is a game of chance or skill.

Responses to 21 self-attributed personality traits were subjected to factor analysis (Hraba et al., 1990). Four factors were extracted, and reliability checks were done on the four resulting scales. The first

personality type is the *civic personality*, composed of hard working, energetic, generous, intelligent, optimistic, conventional, responsible, in-control, and mature (alpha .80). The second is the *self-centered personality*, composed of being a loner, self-centered, materialistic, demanding, anxious, irritable, and restless (alpha .74). The third is the *competitive personality*, being competitive, a risk-taker, and athletic. Although these items are not truly distinguishable from the civic personality, we wanted to isolate a competitive personality type, anticipating that it might be closely associated with problem gambling. The alpha is .64, due to so few items in the scale. The fourth is composed of being a big-spender and impulsive. This alpha is only .53, however, and too low for scale use. These variables are used only as single items in the analysis. The means and standard deviations for the three scales are 6.08, SD = 1.09; 3.79, SD = 1.21; 4.32; SD = 1.62, respectively.

Data Analysis

The possible causes of problem gambling were sorted first into three sets: social structural, associational, and attitudinal sets. Then a regression analysis was conducted for each set. The research question was whether the direct effect of selected associations and attitudes on problem gambling is great enough to suggest preventive/treatment programs that attempt change only in these causes. To deal with these considerations, we used multiple regression equations and a partial F-test. The aim is to assess the direct impact of variables by class of phenomena and thus mutability on problem gambling.

RESULTS

Residential mobility, childhood exposure to gambling, and serving in the armed forces are significantly and positively associated with problem gambling (Beta = .25, .08, and .25, respectively) (Table 2). Moreover, non-white (.16), male (- .10), and respondents with lower education (- .18) report more problem gambling. Being Protestant and Catholic are negatively related to problem gambling (- .20, and - .17, respectively). The best structural predictor of problem gambling is residential mobility and the second is armed-forces service. In an additional stepwise regression of structural variables on problem gambling (not shown), the best predictor is armed forces service,

Table 2
Multiple Regression of Social Structural Phenomena on Problem Gambling

<i>Variable</i>	<i>B</i> ¹	<i>SE B</i> ²	<i>Beta</i> ³	<i>t-value</i> ⁴	<i>Probability</i>
Armed forces service (yes = 1, no = 0)	6.084	1.085	.246	5.609	.001
Church attendance (once a week = 4, one a month = 3, six times per year = 2, less than six times per year = 1).	-.1451	.231	-.025	-.628	.530
Childhood exposure to gambling (never = 1, seldom = 2, sometimes = 3, frequently = 4)	.935	.471	.075	1.988	.047
Number of adults at home	.622	.446	.054	1.396	.163
Ethnicity (white = 1, non-white = 2)	2.694	.620	.162	4.343	.001
Community size (rural area = 1, 500 to 9,999 = 2, 10,000 to 24,999 = 3, 25,000 to 99,999 = 4, suburb over 100,000 = 5, city over 100,000 = 6)	-.025	.216	-.004	-.118	.906
Financial status (having stocks, bonds, and rental property)	.470	.412	.047	1.139	.255
Employed (not employed = 1, employed = 2)	.005	.190	.002	.028	.978
Home ownership (renter = 1, owner = 2)	-.213	.999	-.009	-.214	.831
Education (level of school completed)	-1.191	.277	-.178	-4.302	.001
Income (personal yearly income)	-.044	.293	-.007	-.151	.880
Marital status (non = 1, married = 2)	-.034	.347	-.004	-.097	.923
Gender (male = 1, female = 2)	-1.828	.779	-.099	-2.348	.019
Residential mobility (none = 1, one to three times = 2, four to six = 3, seven and more = 4)	3.493	.620	.252	5.629	.001
Age (18 to 89 years old)	-.049	.031	-.086	-1.610	.108
Protestant	-3.705	1.247	-.197	-2.972	.003
Catholic	-3.428	1.337	-.170	-2.564	.011
Multiple R			.441		
R Square			.194		

¹The regression coefficient.

²Standard errors of coefficient

³The regression coefficient when all variables are expressed in standardized form.

⁴The deviation of the sample mean from the population mean measured in units of the mean's standard error.

otherwise there is no change. Social structural variables as a set explain 19% of the variance (R^2) in problem gambling.

Team lottery play ($Beta = .27$), current exposure to gambling (.08), alcohol consumption (.09), and money spent on lottery play (.24) have significant and positive effects on problem gambling, as expected (Table 3). Money spent on leisure in the past week (-.09) has significant but negative effects on problem gambling, which is unexpected. Watching sports in one's spare time and lottery play itself are not significantly related to problem gambling. Team lottery play and money spent on the lottery are the best associational predictors of problem gambling. This effect on problem gambling results from talking with others about strategies to win the lottery, pooling money with others, picking numbers with others, and sharing lottery tickets and splitting winnings. In an additional stepwise regression of associa-

Table 3
Multiple Regression of Associational Phenomena on Problem Gambling

<i>Variable</i>	<i>B</i> ¹	<i>SE B</i> ²	<i>Beta</i> ³	<i>t-value</i> ⁴	<i>Probability</i>
Team lottery play	2.698	.385	.265	7.010	.001
Watch sports (never = 1, less than monthly = 2, monthly = 3, weekly = 4, daily = 5)	.358	.294	.045	1.219	.223
Money spent on leisure past week	-.539	.249	-.085	-2.162	.031
Current exposure to gambling (none = 1, some = 2, most = 3, nearly all = 4)	1.031	.486	.079	2.123	.034
Lottery play	-.812	1.129	-.033	-.719	.472
Alcohol consumption (none = 1, 1-3 times a week = 2, 4-6 = 3, 7-10 = 4, 11-15 = 5, 16 or more = 6)	.594	.249	.090	2.387	.017
Money spent on lottery play	1.735	.342	.243	5.066	.001
Multiple R			.404		
R Square			.163		

¹The regression coefficient.

²Standard errors of coefficient.

³The regression coefficient when all variables are expressed in standardized form.

⁴The deviation of the sample mean from the population mean measured in units of the mean's standard error.

tional variables on problem gambling (not shown), team lottery play remains the best predictor but money spent on lottery play falls to fifth best predictor. Associational variables as a set explain 16% of the variance in problem gambling.

Gambling attitudes and being a big spender are positively and significantly related to problem gambling (Beta = .27 and .14, respectively) (Table 4). Civic personality is significantly but negatively associated with problem gambling (-.10). Having a self-centered, impulsive, and competitive personality are not significantly related to problem gambling. People whose behavior suggests that they do not accept that lottery play is a chance event by consulting astrological charts and keeping track of winning numbers, for example, are most likely to have gambling problems, followed by those who are big spenders. An additional stepwise regression (not shown) produced identical results. Attitudinal variables as a set explain nearly 12% of the variance in problem gambling.

To further address the policy issue of mutability, we calculated the unique variance in problem gambling explained by each type of phenomena. Do mutable variables explain enough unique variance in problem gambling to suggest their use in preventive or therapeutic efforts? The aim of the first three equations is to assess the direct

Table 4
Multiple Regression of Attitudinal Phenomena on Problem Gambling

<i>Variable</i>	<i>B'</i>	<i>SE B'</i>	<i>Beta</i> ³	<i>t-value</i> ⁴	<i>Probability</i>
Gambling attitudes	4.347206	.612775	.269587	7.094	.0000
Civic personality	-.123846	.051962	-.097664	-2.383	.0175
Self-centered personality	-.034748	.049573	-.031295	-.701	.4836
Impulsive	.202706	.211769	.041221	.957	.3388
Competitive personality	.100086	.084307	.052110	1.187	.2356
Big-spender	.753107	.233284	.142285	3.228	.0013
Multiple R			.34128		
R Square			.11647		

¹The regression coefficient.

²Standard errors of coefficient.

³The regression coefficient when all variables are expressed in standardized form.

⁴The deviation of the sample mean from the population mean measured in units of the mean's standard error.

impact of variables in each class of phenomena on problem gambling (Table 5). This was done by first entering the variables from the other two sets into the equation and then allowing the variables of the third set to enter in a stepwise manner. The fourth equation calculated the unique impact on problem gambling of both associational and attitudinal variables. The final equation is the total variance in problem gambling explained by variables in all three classes of phenomena.

The unique variance in problem gambling explained by social structural variables is 11% (Table 5). The unique contribution of associations and attitudes to problem gambling is 16%. The unique contribution of associations alone is 10%; for attitudes it is 5%. The three sets of predictors together explained 36% of the variance in problem gambling.

The changing variance (R^2) of each structural, associational, and attitudinal class of phenomena after controlling for the other two sets is significant. After controlling for the other two types of phenomena, F values of all three sets of phenomena exceed the critical value at .01 level and, thus, structural, associational, and attitudinal phenomena have unique contributions in predicting problem gambling.

The number of variables in a regression equation may influence the total amount of the variance explained in the dependent variable. As shown in Tables 2 through 4, there is an unequal number of variables across classes of phenomena, with the structural set having the greatest number of variables. This might bias the comparative variances in problem gambling explained by the different sets, favoring structural phenomena.

DISCUSSION

Social structural variables explained 11 percent of the variance in problem gambling, controlling for associational and attitudinal phenomena. The structural variables (without the controls) that significantly impact problem gambling are gender, race, education, religion, residential mobility, armed forces service, and childhood exposure to gambling. These structural variables appear immutable to practitioner's efforts, preventive or therapeutic, concerning problem gambling.

Associations and attitudes together explained 16 percent of the variance in problem gambling, controlling for structural phenomena. Our argument is that these phenomena are more mutable than struc-

Table 5
Partial F-test for Three Levels of Phenomena

<i>Source of Variation</i>	<i>Sums of Squares</i>	<i>D.F.</i>	<i>Mean Squares</i>	<i>F</i>	<i>Significant level</i>	<i>R²</i>
Regression						
Structural Phenomena	10133.09	17	596.06	8.64	P < .01	.194 ¹
Structural Phenomena after controlling for Associational and Attitudinal phenomena	5866.61	17	345.09	6.14	P < .01	.113 ²
Regression						
Associational Phenomena	8462.86	7	1209.00	17.14	P < .01	.163 ³
Associational Phenomena after controlling for Structural and Attitudinal phenomena	5084.75	7	726.39	12.91	P < .01	.096 ⁴
Regression						
Attitudinal Phenomena	6076.17	6	1012.69	13.63	P < .01	.116 ⁵
Attitudinal Phenomena after controlling for Structural and Associational phenomena	2553.06	6	425.51	7.56	P < .01	.049 ⁶
Regression						
Associational and Attitudinal phenomena	12723.14	13	978.70	15.22	P < .01	.244 ⁷
Associational and Attitudinal phenomena after controlling for Structural phenomena	8456.65	13	650.51	11.56	P < .01	.162 ⁸
Regression						
Structural, Associational and Attitudinal phenomena	18589.74	30	619.66	11.01	P < .01	.357

¹The square of the multiple correlation coefficient when all structural variables are in the equation.

²The increase in R² when all structural variables are entered in to an equation that already contains the other two sets of variables.

³The square of the multiple correlation coefficient when all associational variables are in the equation.

⁴The increase in R² when all associational variables are entered into an equation that already contains the other two sets of variables.

⁵The square of the multiple correlation coefficient when all attitudinal variables are in the equation.

⁶The increase in R² when all attitudinal variables are entered in to an equation that already contains the other two sets of variables.

⁷The square of the multiple correlation coefficient when all associational and attitudinal variables are in the equation.

⁸The increase in R² when all associational and attitudinal variables are entered into an equation that already contains structural variables.

ture to a practitioner's effort. Did associations and attitudes explain enough variance in problem gambling (controlling for structure) to suggest their inclusion in preventive/therapeutic programs?

There are two possible criteria by which to make such a decision. One is for researchers. How much variance in problem gambling should we expect associations and attitudes to explain? All independent variables in any one piece of social research typically explain between 20 and 40 percent of the dependent variable(s). Inadequate theory, random and systematic error in data sets, along with a multi-causal world dictates this modest expectation. In this study, we explained 36 percent of the variance in problem gambling with all three types of phenomena and 16 percent with only associations and attitudes. Our conclusion is that we are close to this first criterion.

A second criterion is for the practitioner rather than the researcher. How much of a contribution to problem gambling does an attitude or association have to make for a practitioner to include it in preventive or therapeutic programs? The larger the better is the simple answer, of course. The more complex answer must be based on some realistic criterion, as we argued for the researcher. One such criterion for the practitioner comes to mind. Most practitioners in the treatment of problem gambling are using psychological and psychiatric diagnostic, predictive, and treatment tools. How much of the variance in problem gambling is explained by the psychological states diagnosed or treated by these tools? Whatever it is, be it higher or lower than the 16% for associational and attitudinal variables in this paper, we suggest this to be a reasonable standard by which to compare results from social research.

Another consideration for better translating research into practice lies in what specific mutable variables are found to be predictors of problem gambling. The associational predictors found in this study are exposure to gambling through social networks in which one gambles with others, at least engages in team play of the lottery. Spending heavily on the lottery and drinking appear to be part of this camaraderie around gambling. These associational correlates are linked to two predictive attitudes. One is being a self-described big-spender and the other is a behavioral pattern that implies gambling is not seen as a chance event. Using gambling strategies suggests that one and one's gambling pals believe they can beat the odds by picking their own lotto numbers, consulting astrological charts, and buying multiple tickets.

This attitude is also associated with a poor education, a structural predictor of problem gambling.

These predictors suggest specific considerations for preventive/therapeutic programs. Educating the public or clients in treatment about the odds in gambling (e.g., that a lottery is no more than a chance event) is a starting point for practitioners dealing with problem gambling in this country. Instead of advertising that "you can't win if you don't play," practitioners might emphasize that the chances for a big win with a single ticket is 55 million to one and not appreciably better for 100 tickets. This could counter the illusion of control over the odds implied by using gambling strategies and buying multiple tickets (money spent on lottery play), possibly due to the lack of education and reinforced by friends engaged in team gambling.

Gambling is inherently a social event; at the very least it takes two to wager. This simple observation is buttressed by findings in this research. The causes of problem gambling found in this research are not so much personality states as interaction events. The implication is problem gambling follows as much from social interaction as from an internal disorder of impulse control; it is as much a sociological as a psychological phenomenon. It is through social interaction that problem gamblers are exposed to gambling, and this interaction can support their peculiar attitudes about gambling—that the odds can be beat. Mental health practitioners have been cognizant of the social context of other disorders for some time and counsel, for example, an entire family rather than just the one member with a problem. The social networks to which gamblers belong and understand their gambling are also entry points for doing something about problem gambling. Not all known psychological correlates of problem gambling were included in this study, particularly absent are standardized measures of personality states, so future research must provide for a more complete assessment of the relative contributions of psychological and sociological causes of problem gambling.

REFERENCES

- Abt, V., Smith, J.F. & Christiansen, F.M. (1985). *The business of risk: Commercial gambling in mainstream America*. Lawrence, KS: University of Kansas Press.
- American Psychiatric Association (1980). *Diagnostic and statistical manual of mental disorders*. Third Edition. Washington, DC: Author.

- American Psychiatric Association (1987). *Diagnostic and statistical manual of mental disorders*. Third Edition, revised. Washington, D.C.: Author.
- Bergler, E. (1958). *The psychology of gambling*. London: Harrison.
- Clotfelter, C.T. (1979). On the regressivity of state-operated numbers games. *National Tax Journal*, 32, 543-548.
- Clotfelter, C.T. & Cook, P.J. (1989). *Selling hope: State lotteries in America*. Cambridge, MA: Harvard University Press.
- Frey, J.H. (1984). Gambling: A sociological review. *Annals*, 474, 107-120.
- Hraba, J. (1989). *Report to Iowa Department of Human Services: Research on The Iowa Lottery and Gambling*. Ames, Iowa: Department of Sociology, Iowa State University.
- Hraba, J., Mok, W. & Huff, D. (1990). Lottery play and problem gambling. *Journal of Gambling Studies*, 6, 355-377.
- Jacobs, D. (1989). Illegal and undocumented: A review of teenage gambling and the plight of children of problem gamblers in America. In H.J. Shaffer, S.A. Stein, B. Gambino and T.N. Cummings (Eds.). *Compulsive gambling: Theory, research, and practice*. (pp. 249-291). Lexington, MA: Lexington Books.
- Kallick, M., Suits, D., Dielman, T. & Hybels, J. (1979). Gambling participation. In M. Kallick, D. Suits, T. Dielman, and J. Hybels (Eds.). *A survey of American gambling attitudes and behavior*. (pp. 1-44). Ann Arbor, MI: Survey Research Center. Institute for Social Research.
- Langer, E.J. (1983). *The psychology of control*. Beverly Hills: Sage Publications.
- Lesieur, H.R. (1977). *The chase: Career of the compulsive gambler*. Garden City, N.Y.: Anchor.
- Lesieur, H.R. (1979). The compulsive gambler's spiral of options and involvement. *Psychiatry*, 42, 79-87.
- Lesieur, H.R. & Blume, S. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for the identification of pathological gamblers. *American Journal of Psychiatry*, 114, 1184-1188.
- Lieberman, L. (1988). *A social typology of gambling behavior*. NY: National Council in Compulsive Gambling.
- Livernois, J. (1987). The redistributive effects of lotteries: Evidence from Canada. *Public Finance Quarterly*, 15, 339-351.
- Mok, W. & Hraba, J. (1991). Age and gambling behavior: A declining and shifting pattern of participation. *Journal of Gambling Studies*, 7, 313-335.
- Moran, E. (1975). Pathological gambling. *Contemporary Psychiatry*, British Journal of Psychiatry, Special Publication No. 9. London: Royal College of Psychiatrists.
- Orford, J. (1985). *Excessive appetites: A psychological view of addictions*. NY: John Wiley and Sons.
- Rosecrance, J. (1986). Attributions and the origins of problems gambling. *The Sociological Quarterly*, 27, 463-477.
- Sommers, I. (1988). Pathological gambling: Estimating prevalence and group characteristics. *International Journal of the Addictions*, 23, 477-490.
- Spiro, M.H. (1974). On the incidence of the Pennsylvania Lottery. *National Tax Journal*, 27, 57-61.
- Suits, D.B. (1977). Gambling taxes: Regressivity and Revenue Potential. *National Tax Journal*, 30, 19-35.
- Transition Planning Associates (1985). *A survey of pathological gamblers in the state of Ohio*. Philadelphia, PA.
- Vaillancourt, F. & Grignon, J. (1988). Canadian lotteries as taxes: Revenues and incidence. *Canadian Tax Journal*, 36, 369-388.
- Volberg, R.A. & Steadman, H.J. (1988). Refining prevalence estimates of pathological gambling. *American Journal of Psychiatry*, 145, 502-505.
- Wells, C. (1989). America's gambling fever: Everybody wants a piece of the action-but is it good for us? *Business Week*, 3102 (April 24), 112-120.
- Winston, S. & Harris, H. (1984). *Nation of gamblers*. Englewood Cliffs, NJ: Prentice-Hall.