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Article in *Journal of Sport & Exercise Psychology* · June 1997

DOI: 10.1123/jsep.19.2.197

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Skill Versus Luck: A Motivational Analysis of Gambling Involvement

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The purpose of the present investigation was to test the skill/luck distinction among gambling games by comparing the motivations underlying participation in a skill (horse racing) and a luck (lottery) betting activity. Predictions were made using Self-Determination Theory (Deci & Ryan, 1985, 1991). It was predicted that self-determined motivations (intrinsic motivation and identified regulation) would be more prominent for the skill game because it is conducive to optimal challenges, fun, and self-involvement. Conversely, the non self-determined forms of motivation (especially external regulation) should be more important for the game of luck because the luck dimension precludes true involvement of the self and orients the individual towards material gains. Results from a hierarchical discriminant function analysis, with 120 gamblers predominantly involved in one of the two betting activities, supported these hypotheses. These results highlight the relevance of a motivational analysis for a better understanding of the inherent properties of gambling games.

INTRODUCTION

The popularity of gambling continues to increase in the province of Quebec (Canada) (Ladouceur, 1994). The state agency of Loto-

The investigation reported in this paper was made possible by a research grant from Loto-Quebec.

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Quebec has indeed greatly diversified its line of wagering products since its inception in 1970. In addition to lotteries, three casinos and a network of video-poker machines are now in operation in Quebec (with net profits of Can\$480.6, Can\$193.6 & Can\$18.4 million, respectively, for 1994-1995 fiscal year Loto-Quebec, 1995). Racetracks are also in operation in major cities such as Montreal and Quebec. In sum, the availability of gaming products within the Quebec jurisdiction is as wide and diversified as those of countries such as Australia and the United States.

Extant gambling studies suggest that certain gambling games primarily require the use of personal skills whereas others center mainly on luck (e.g., Gallois, 1961; Epstein, 1967; Walker, 1985, 1992). For instance, horse race gambling is deemed skillful because it involves the acquisition of specialized knowledge; that is, its very structure requires one to synthesize a great deal of information (e.g., racetrack conditions, previous performances of horses). In contrast, because they do not require such specialized learning and because they are easily accessible to everyone, lotteries are considered to appeal more to luck than to skills (see Walker, 1992 for a more detailed discussion).

Keren and Wagenaar (1988), in an exemplar investigation, tried to identify gamblers' perceptions underlying the skill/luck distinction. According to these authors, such perceptions emphasize the nature of the payment rules which characterize the two types of games. For instance, casino games such as blackjack would be perceived as skill games because they provide repeated small wins—which follow an intermittent positive reinforcement schedule—thus allowing gamblers the greatest latitude in interpreting their bets as being effective and skillful. Thus, a gambler who just experienced a winning streak on a series of bets might attribute these gains to personal skills which are thought to provide an edge over fellow gamblers who did not experience such a fruitful series. In contrast, lotteries would be perceived as games of luck because they involve low probabilities of winning as well as almost equal chances of winning among participants. For these reasons, gamblers would conclude that personal skills are of little help in games such as lotteries. In spite of its merit in emphasizing the relevance of personal perceptions to the study of the skill/luck distinction, this particular investigation suffered from the fact that participants were students whose gambling status was not clearly documented. Also, games that were selected excluded prevalent games such as horse race gambling. Other studies dealing with the skill/luck distinction shared similar limitations and

have rarely focused on more than one gambling game (e.g., Bouts, & Van Avermaet, 1992; Burger, 1986, 1991; Carroll, & Huxley, 1994; Halpern, & Devereaux, 1989; King, 1990; Kuszyszyn & Rubenstein, 1985; Lester, 1980; Wagenaar, & Keren, 1988).

In light of the above, further research on the skill/luck distinction must deal with a number of concerns. First, a game in which skill is clearly prominent needs to be contrasted to a game in which luck is the dominant factor, within the same study. That is, even if most gambling situations involve both skill and luck perceptions, a dominance of one type of perception over the other has been evidenced for games such as horse race gambling and lotteries. Indeed, the prominence of perceived skills has been reported for the former game whereas a dominance of perceived luck has been reported for the latter (Allcock & Dickerson, 1986). Although horse race gambling and lotteries include both types of perceptions, they are far apart along a continuum ranging from a dominance of luck to one of skill (see Walker, 1985). Second, the use of gamblers displaying steady involvement in either type of game would reveal more information than information gathered from subjects with an unclear gambling status. Third, personal variables that act beyond perceptions of games' structures need to be identified in order to determine how they relate to gambling involvement. Stated differently, are there personal characteristics that attract some gamblers' toward more challenging games, such as horse race gambling, while leaving others fully satisfied with more random and luck-based types of games, such as lotteries? What is the basis for such a difference in gambling involvement? Do such characteristics drive a sizeable portion of gamblers to exert their skills in more demanding types of games?

The present investigation is based on the above concerns. The goal was to address the skill/luck distinction by documenting the types of gambling motivation which are at work in either horse race gambling, on the skill side, or lotteries, on the luck side. It was anticipated that gambling motivation would appropriately predict involvement in either one of these two types of games.

On Gambling Motivation

Building on Self-Determination Theory (Deci & Ryan, 1985, 1991), Chantel, Vallerand, and Vallieres (1994, 1995) have recently suggested that gambling motivation stems from two fundamental psychological

needs, namely, that of autonomy and that of competence. On the one hand, autonomy represents a self-directed and flexible capacity to choose, among several courses of action, the one that will bring desired consequences. Competence, on the other hand, entails a sense of being effective in one's interactions with the environment (Deci, 1980; Deci, & Ryan, 1985). Five kinds of motivation are defined in this framework: intrinsic motivation (IM), identified regulation, introjected regulation, external regulation, and amotivation.

Intrinsic motivation and identified regulation are, by definition, self-determined. Both are characterized by an internal locus of causality; that is, reasons for engaging in an activity emanate from one's self, and not from external factors (deCharms, 1968; Deci, & Ryan, 1991; Koestner, & Knuckerman, 1994). Three specific types of IM have been identified (see Valleraud, Blais, Brière, & Pelletier, 1989; Valleraud, Pelletier, Blais, Brière, Sénécal, & Vallières, 1992 for a tripartite taxonomy of IM). First, *IM toward stimulation* is implicated when one gambles in order to experience sheer excitement (e.g., the thrill of horse race finishes). Second, *IM toward knowledge* is at work when gambling is associated with the pleasure of acquiring new game knowledge (e.g., gathering data about previous horse races). Third, one may gamble for the pleasure of surpassing oneself in the course of betting activities, thus displaying *IM toward accomplishment* (e.g., improving one's skills in handicapping horse races). The last type of self-determined motivation, *internalized regulation*, is operative when one chooses gambling as a means to reach a goal deemed important for oneself (e.g., socializing with friends).

In contrast, non self-determined types of motivation imply an external locus of causality; that is, the locus of initiation for engaging in an activity is external to one's self (deCharms, 1968; Deci, & Ryan, 1991; Koestner, & Zuckerman, 1994). This category involves two types of extrinsic motivation which pertain to activities that are performed in order to receive or to avoid something once the activity is terminated (Deci, & Ryan, 1985, 1991). *External regulation* is involved when one gambles in order to obtain external rewards (e.g., gambling on lotteries in the hope of becoming rich) and *introjected regulation* is implicated when gambling becomes regulated by self-imposed pressures such as guilt (e.g., pressuring oneself to use the same lottery ticket numbers from draw to draw). A last type of non self-determined motivation is

amotivation. It refers to activities which are neither intrinsically nor extrinsically motivated, and takes place when one does not perceive contingencies between gambling outcomes and one's own actions. In other words, amotivated gamblers are impaired with respect to their sense of choice and control over their betting habits. Some preliminary evidence has been reported by Chantal et al. (1994) over this issue. Hence, a compulsive gambler who keeps on betting with no real purpose and with little sense of meaning displays amotivation.

Most relevant to the present investigation is an additional postulate of Self-Determination Theory concerning the seeking of optimal challenges (see Deci & Ryan, 1985, 1991). In accordance with this postulate, self-determined types of motivation would foster a desire to be involved in activities which are challenging; that is, activities which require one to exert one's skills (see also Harter, 1978; Ryan, & Stiller, 1991; Ryan, 1993 on this issue). With respect to gambling, involvement in games of skill would thus be strictly related to self-determined types of motivation whereas no self-determined types of motivation would be operative in games of luck.

Hypotheses

In line with the above, two sets of hypotheses were formulated. First, it was anticipated that gambling motivation would prove to be an appropriate predictor of involvement in either horse race gambling or lotteries. It was also expected that even if horse race gambling and lotteries differ considerably in relation to common indicators of involvement (e.g., large versus low weekly bets), such indicators would not substantially improve the prediction already achieved by means of the motivational predictors alone. The second set of hypotheses concerned motivational means. Since horse race gambling is deemed skillful, it was expected to be associated with the seeking of optimal challenges and consequently, with higher levels of self-determined types of motivation (i.e., the three types of IM and identified regulation). Conversely, because lotteries centre on luck and thus, on an external locus of causality, involvement in this type of game was expected to be associated with higher levels of non self-determined types of motivation (i.e., introjected and external regulation).

METHODOLOGY

Participants

A total of 120 French-Canadian gamblers participated in the investigation. The first half of the sample was comprised of 30 female and 30 male gamblers (mean age = 35.4) who had been involved in lotteries for an average period of 6 years. Their mean annual income amounted to \$25,503 (excluding gambling winnings) and, on a weekly basis, they spend about \$37 on lottery tickets. The second half of the sample consisted of 29 female and 31 male gamblers (mean age = 48 years) who were involved in horse race gambling for a mean period of 15 years. On average, they earned \$32,121 per year and spent \$196 weekly on horse races.

Procedures and Questionnaire

Data collection was carried out at a racecourse located in the Montreal area and at lottery ticket outlets. Participants were informed that the purpose of the investigation concerned their general attitudes towards gambling. Confidentiality was emphasized; that is, participants were not required to write down identifying information and they were told that no one would know how they had responded, individually, to the questionnaire's items.

In the first part of the questionnaire, participants were asked to select either horse race gambling or lotteries as the game to which they devoted the greatest amount of time and money. They were explicitly instructed to refer to the game they selected in completing subsequent parts of the questionnaire.

The second part of the questionnaire was comprised of the French version of the Gambling Motivation Scale (GMS) which is derived from the tenets of Self-Determination Theory (see Chantal et al., 1994 for a detailed description of this instrument). The GMS is made up of 28 items which represent potential answers to the following question: "Why do you gamble?". Items are scored on a 7-point Likert-type scale ranging from *Does not correspond at all* (1) to *Corresponds exactly* (7) [with *Corresponds moderately* as the midpoint (4)]. The GMS involves 7 subscales that correspond to the seven types of motivation described earlier in introduction. For example, items such as "For the pleasure I feel when my knowledge of the game improves", and "Because it is the best way I know

of for meeting friends" compose the IM towards Knowledge and Identified Regulation subscales respectively, whereas the External Regulation and Amotivation subscales are composed of items such as "To buy something I have been dreaming of", and "I gamble but at times I wonder if it's worth it," respectively. Internal consistency values of the seven subscales (Cronbach's α) proved to be reliable: .84 for IM towards Knowledge, .78 for IM towards Accomplishment, .80 for IM towards Experience Stimulation, .77 for Identified Regulation, .77 for Introjected Regulation, .89 for External Regulation, and .80 for Amotivation.

Besides standard demographic information, the final part of the questionnaire dealt with gambling involvement. Participants were asked to report the number of years they had been involved in the game they previously selected (i.e., years of experience) and to estimate the weekly amount of money they used to bet on this game (i.e., weekly bets).

RESULTS

Preliminary Analyses

A 2 X 2 MANOVA (Gender X Game) involving the GMS subscales as dependent variables was performed in order to ascertain gender differences on the mean levels of the motivational variables. This analysis did not yield significant results with respect to gender. Similarly, independent t-tests failed to reveal significant gender differences with respect to age, annual income, years of experience, and weekly bets. Consequently, the data were analyzed using the pooled sample of female and male gamblers.

Preliminary analyses were also performed in order to ascertain if the predictors' scores distribution were normally distributed. The use of Mahalanobis distance did not reveal the presence of multivariate outliers. However, the distributions of scores for Introjected Regulation and Weekly bets were both negatively skewed. Logarithmic transformation was thus applied on these variables prior to main analyses (Tabachnik & Fidell, 1989).

Main Analysis

A hierarchical discriminant function analysis was performed in order to assess classification of gamblers according to their involvement

in either horse race gambling or lotteries. This type of analysis assesses improvement of classification which results from the inclusion of a new group of predictors to a set of target predictors (Tabachnick & Fidell, 1989). In the present case, the GMS subscales were entered first as target predictors, while the Years of experience and Weekly bets variables formed the additional group of predictors. A significant function emerged at Step 1 suggesting that motivational predictors allowed significant classification between gamblers who were involved in horse race gambling versus those who were involved in lotteries (Wilks's $\lambda = .49$, and $\chi^2(7) = 80.6$, $p < .0001$). Indeed, 83% of the cases were correctly classified as opposed to a rate of 50% which would have been predicted by chance alone. In addition, this function explained 50% of the variance (i.e., squared canonical correlation, see Tabachnick & Fidell, 1989). The inclusion of the Weekly bets and Years of experience variables at Step 2 slightly improved the classification rate which went up to 91% (McNemar's $\chi(1) = 5.79$, $p < .05$). Although significant, this increment in prediction is not surprising given the tremendous discrepancy which exists between the amount of money required by horse race gambling versus that required in order to purchase lottery tickets.

The loading matrix of correlations between the various predictors and the final discriminant function (Steps 1 & 2) appear in Table 1. It is displayed along with univariate F ratios, and the predictor's means for both horse race gambling and lotteries. This matrix reveals that Identified Regulation, External Regulation, IM toward Knowledge, IM toward Accomplishment, and IM to Experience Stimulation formed a common factor of self-determined motivation (with respective loadings of: .53, -.46, .31, .23, & .22). The negative sign for External Regulation is consistent with this interpretation to the extent that it represents the only non self-determined type of motivation on this factor. The Weekly bets and Years of experience variables also loaded on this factor (with respective loadings of .61 & .38) thus suggesting a combination which is consistent with the results of Chantal et al. (in press) who found that gambling involvement was positively related to self-determined types of motivations.

With respect to motivational means, horse race gamblers exhibited significantly higher levels of self-determined motivation [Identified Regulation, $F(1, 118) = 62.28$, $p < .0001$, IM towards Knowledge, $F(1, 118) = 20.28$, $p < .0001$, IM toward Accomplishment, $F(1, 118) = 11.77$, $p < .001$, IM to Experience Stimulation, $F(1, 118) = 10.32$, $p < .01$] than those displayed by lottery gamblers. These results suggest that involvement in horserace

Table 1
Involvement in Horse Race Gambling versus Involvement in
Lotteries: Loading Matrix of Correlations, Univariate F ratios, and
Predictors' Means

Predictors	CPD	F Ratios (1,118)	Means	
			Horse Race	Lotteries
IM Knowledge	.31	20.28****	4.02	2.69
IM Accomplishment	.23	11.77****	3.53	2.56
IM Stimulation	.22	10.32**	4.19	3.32
Identified Regulation	.53	62.28****	4.02	2.08
Interojected Regulation ^a	.07	1.14	2.04	1.81
External Regulation	-.46	45.98****	2.45	4.70
Annotation	.02	0.06	3.27	3.19
Years of experience	.38	30.71****	15	6
Weekly bets (\$) ^a	.61	81.59****	196	36

Note: CPD = Correlations between predictors and discriminant function, ^a = Raw scores, ** $p < .01$, *** $p < .001$, **** $p < .0001$.

gambling was based on one's desire to exert one's skills in taking up the challenges offered by this game. Indeed, horse race gamblers of the present sample reported that they gambled for the pleasure of acquiring game knowledge, for the satisfaction of accomplishing themselves as efficient gamblers, and for the pleasure of being stimulated by the races. They also seemed to consider their gambling involvement as an ideal means of reaching goals deemed important for themselves. These findings are further substantiated by a much longer period of involvement on the part of horse race gamblers [e.g., 15 versus 6 years, univariate $F(1, 118) = 30.71$, $p < .0001$]. In contrast, and in addition to scoring lower on the above variables, lottery gamblers reported significantly higher levels of External Regulation [univariate $F(1, 118) = 45.98$, $p < .0001$] thus indicating that they gambled mainly for the sake of money.

DISCUSSION

The goal of the present investigation was to address the skill/luck distinction by identifying the types of gambling motivation which are predictive of involvement in either horse race gambling, on the skill

side, or lotteries, on luck side. Two sets of hypotheses were upheld by the results of a hierarchical discriminant function analysis. First, both self-determined and non self-determined types of motivation proved to be appropriate predictors of gambling involvement. As anticipated, the addition of relevant indicators of gambling involvement did not substantially improve the classification rate already achieved by means of the motivational predictors alone. With respect to the second set of hypotheses, it was anticipated that self-determined motivations (IM and identified regulation) would be more prominent for horse race gambling because this game of skill is conducive to optimal challenges, fun, and self-involvement. Conversely, it was expected that non self-determined motivations (especially external regulation) would be more important for lotteries since this game of luck does not require true involvement of the self and orients the individual toward material gains. These predictions were globally supported by univariate analyses involving motivational means.

The present results suggest that gambling motivation might lead to a better understanding of the inherent properties of gambling games. More precisely, gamblers who are self-determined with respect to their betting habits (i.e., gambling out of a sense of choice and pleasure) may be more sensitive to games with features that provide opportunities to exert their skills. In short, self-determined gamblers may be more strongly attracted to games of skill because of such features. Horse race gambling represents a good example of such a rationale. Indeed, one important feature of this particular game concerns the progressive acquisition of specialized knowledge. To self-determined gamblers such a feature might act as an incentive to engage in horse race gambling on a regular basis. Conversely, since the betting habits of non self-determined gamblers are regulated by external factors, these gamblers might be more attracted to games that center on a salient external factor such as luck. These findings are in line with Wagenaar and Keren's (1988) contention that research should place more emphasis on gambler's perceptions of the skill and luck features pertaining to gambling games in which they are currently involved.

The present results should be interpreted cautiously. First, unless they are replicated with gamblers from various cultural backgrounds, these results may be applicable only to French Canadians. Second, the impact of motivation on game selection may actually be due to a third variable which covaries with motivation. For instance, it is possible that

gamblers who display a high level of IM toward accomplishment also feel highly confident about their gambling abilities. Confidence, in turn, may lead gamblers to select games of skills. In the same vein, a third factor such as intelligence may also be at work in determining both preference for games involving skills and a more self-determined approach to motivation. Third, our investigation was based on a correlational design. Hence, the present results may be reinterpreted by positing that preference for either horse races or lotteries might have come first, that is, prior to the development of one's prominent type of gambling motivation. This analysis is in line with Cornish's (1978) contention that the initial choice of a form of gambling is more likely to be made according to availability, chance, and family experiences. The chosen form of gambling then develops into a usage that satisfied intrapersonal needs. If such were the case, the participants' answers to the motivational scale would then merely represent a posteriori justifications for their chosen form of gambling. A prospective or even an experimental design would provide a clearer demonstration that gambling motivation does indeed predict the nature of future gambling involvement.

In conclusion, the results of the present investigation point to the relevance of investigation the skill/luck distinction by using key-personal characteristics such as gambling motivation. They also demonstrate the usefulness of including contrasting types of games within the same study.

REFERENCES

- Allcock, G., & Dickerson, M.G. (1986). *The guide to good gambling*. New South Wales: Social Science Press.
- Bouts, P., & Van Avermaet, E. (1992). Drawing familiar or unfamiliar cards: Stimulus familiarity, chance orientation, and the illusion of control. *Personality and Social Psychology Bulletin*, 18, 331-335.
- Burger, J.M. (1986). Desire for control and the illusion of control: The effects of familiarity and sequence of outcomes. *Journal of Research on Personality*, 20, 66-76.
- Burger, J.M. (1991). The effects of desire for control in situations with chance-determined outcomes: Gambling behavior in lotto and bingo players. *Journal of Research on Personality*, 25, 196-204.
- Callons, R. (1961). *Man, play and games*. Great Britain: Thames and Hudson.
- Carroll, D., & Huxley, J.A.A. (1994). Cognitive, dispositional, and psychophysiological correlates of dependent slot machine gambling in young people. *Journal of Applied Social Psychology*, 24, 1070-1083.
- Chantal, Y., Valleraud, R.J., & Vallières, E.F. (1994). Construction et validation de l'Échelle de Motivation relative aux Jeux de Hasard et d'Argent [On the construction and validation of the Gambling Motivation Scale (GMS)]. *Society and Leisure*, 17, 189-212.

- Chantal V., Valleraud, R.J., & Vallières, E.F. (1995). Motivation and gambling involvement. *Journal of Social Psychology, 135*, 755-763.
- Cornish, D.B. (1978). *Gambling: A review of the literature and its implications for policy and research*. London: Home Office Research Study.
- deCharms, R. (1968). *Personal causation: The internal affective determinants of behavior*. New York: Academic Press.
- Deci, E.L. (1980). *The psychology of self-determination*. Lexington, MA: D.C. Heath and Company.
- Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E.L., & Ryan, R.M. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska symposium on motivation, 38: Perspectives on motivation* (p. 237-288). Lincoln, NE: University of Nebraska Press.
- Epstein, R.A. (1967). *The theory of gambling and statistical logic*. New York: Academic Press.
- Halpern, A.R., & Devereaux, S.D. (1989). Lucky numbers: Choice strategies in the Pennsylvania daily number game. *Bulletin of the Psychonomic Society, 27*, 167-170.
- Harter, S. (1978). Efficance: motivation reconsidered: Toward a developmental model. *Human Development, 1*, 34-64.
- Keren, G., & Wagenaar, W.A. (1988). Chance and skill in gambling: A search for distinctive features. *Social Behavior, 3*, 199-217.
- King, K.M. (1990). Neutralizing marginally deviant behavior: Bingo players and superstition. *Journal of Gambling Studies, 6*, 43-61.
- Koestner, R., & Zuckerman, M. (1994). Causality orientations, failure, and achievement. *Journal of Personality, 62*, 321-346.
- Kusysyn, I., & Kubenstain, L. (1985). Locus of control and race track betting behaviors: A preliminary investigation. *Journal of Gambling Behavior, 1*, 106-110.
- Ladouceur, R. (1994). La psychologie des jeux de hasard et d'argent: Aspects fondamentaux et cliniques [The psychology of gambling: fundamental and clinical aspects]. *Society and Leisure, 17*, 213-232.
- Lester, D. (1980). Choice of gambling activity and belief in locus of control. *Psychological Reports, 47*, 22.
- Lotte-Quebec (1995). *Keppport annual 1994-1995 [1994-1995 Annual Report]*.
- Ryan, R.M. (1993). Agency and organization: Intrinsic motivation, autonomy an the self in psychological development. In R. Dienstbier (ed.), *Nebraska symposium on motivation, Vol. 40: Developmental perspectives on motivation* (p. 1-56). Lincoln, NE: University of Nebraska Press.
- Ryan, R.M., & Stiller, J. (1991). The social contexts of internalization: Parent and teacher influences on autonomy, motivation, and learning. In M.L. Maehr & P.R. Pintrich (eds.), *Advances in motivation and achievement: A research annual* (p. 115-150). Greenwich, CT: JAI Press.
- Tabachnick, B.G., & Fidell, L.S. (1989). *Using Multivariate Statistics (2nd edition)*. New York: Harper Collins.
- Valleraud, R.J., Blais, M.R., Brière, N.M., & Pelletier, L.G. (1989). Construction et validation de l'échelle de motivation en éducation (EME). *Canadian Journal of Behavioural Science, 21*, 323-349.
- Valleraud, R.J., Pelletier, L.G., Blais, M.R., Brière, N.M., Sénécal, C., & Vallières, E.F. (1992). The Academic Motivation Scale: A measure of intrinsic, extrinsic, and amotivation in education. *Education and Psychological Measurement, 52*, 1003-1019.
- Wagenaar, W.A., & Keren, G. (1988). Chance and luck are not the same. *Journal of Behavioral Decision Making, 1*, 65-75.
- Walker, M.B. (1985). Explanations for gambling. In G.T. Caldwell, M.G. Dickerson, B. Haig, and L. Sylvan (Eds.), *Gambling in Australia*. Sydney: Groom Helm.
- Walker, M.B. (1992). *The psychology of gambling*. New York: Pergamon Press.