



VICTORIA UNIVERSITY
MELBOURNE AUSTRALIA

Beliefs about control over gambling among young people, and their relation to problem gambling.

This is the Published version of the following publication

Moore, Susan M and Ohtsuka, Keis (1999) Beliefs about control over gambling among young people, and their relation to problem gambling. *Psychology of Addictive Behaviors*, 13 (4). pp. 339-347. ISSN 0893-164X

The publisher's official version can be found at

Note that access to this version may require subscription.

Downloaded from VU Research Repository <https://vuir.vu.edu.au/361/>

Psychology of Addictive Behaviors

Beliefs about control over gambling among young people, and their relation to
problem gambling¹

Susan M. Moore² & Keis Ohtsuka

Victoria University

Submitted: 25 June, 1998

Resubmitted 23th October, 1998

Word count: approx 5800

This is the final text version of the article published as:

Moore, S. M., & Ohtsuka, K. (1999). Beliefs about control over gambling among young people, and their relation to problem gambling. *Psychology of Addictive Behaviors*, 13, 339-347.

Abstract

The aim of this study was to assess the association between beliefs about two types of control, (a) illusion of control, and (b) internal locus of control, and gambling frequency/problem gambling among young people aged 14 to 25 years (435 males; 577 females, 5 unreported gender). A revised version of the South Oaks Gambling Screen plus measures of gambling frequency and gambling beliefs were administered. Results indicated that irrational control beliefs were strongly associated with problem gambling. Young problem gamblers were more likely to believe that they needed money and that gambling would provide it. In addition, young problem gamblers had more faith in their ability to manipulate chance, and 'beat the system'. Regression models with illusion of control and internal control over gambling significantly predicted gambling frequency and problem gambling.

There is more than one sense in which people believe they have control over their gambling. First there is the adaptive sense of having control over whether and when to gamble and how much to spend (Corless & Dickerson, 1989). Another sense in which the word 'control' is used is the sense of 'illusion of control', that is, the invocation of superstitious behaviour as a (flawed) way of attempting to influence winning or losing at gambling (Langer, 1975; Langer & Roth, 1975). Yet a third sense in which control is used in relation to gambling is in clinical accounts of problem and pathological gamblers, who may report that one of the (irrational) reasons they gamble is as a means of getting their life or finances back under control (eg., Brown & Coventry, 1997). Each of these three types of control will be discussed in turn.

The psychological construct of 'locus of control' (eg., Rotter, 1966) refers to the internalised belief that one has the capacity to influence life events, such as achievement, happiness or health status. Individuals who describe their capacity for such control as strong are identified as having an internal locus of control, while those who give more weight to the influence of chance or powerful others on their fate are described as having an external locus of control. Some researchers have attempted to relate locus of control to gambling behaviour (eg., Kusyszyn & Rubenstein, 1985; Zenker & Wolfgang, 1982), but results have not been clear-cut. This may be because of conceptual confusion between types of control beliefs, some of which are likely to be useful or realistic in managing gambling and others which are not. Frank and Smith (1989) present a theoretical matrix which shows the nature of situations (controllable or uncontrollable), and the nature of individuals' attributions of control, that is, whether they believe they can influence the situation or not. In the body of their four-celled matrix are examples of expected behaviours. For example, in controllable situations those who believed they had control would show competent behaviour, such as effort and persistence in maintaining that control, typical behaviours noted among 'internals' in classic locus of control research (eg., Davis & Phares, 1967). On the other hand, those who believed they had little control in controllable situations

are characterised by what has been termed 'learned helplessness', with its behavioural concomitants of depression, low motivation and low effort (eg., Seligman, 1975). Whether to gamble, and how much to spend, is in fact, one element of gambling that is potentially, totally under the control of individual gamblers. It is predicted that belief in control over when and whether to gamble (internal locus of control with respect to gambling) will be associated with non-problem gambling.

Frank and Smith's (1989) matrix also includes uncontrollable situations, examples of which abound in gambling. In short, the ability to control winning is either limited (in gambling situations with some non-random parameters), or non-existent, as in truly random gambles like lotteries. Individuals may realistically believe they have no control over uncontrollable situations, leading, according to Frank and Smith, to coping behaviours such as resignation or changed strategies. These might include avoiding gambling altogether or gambling to a budget. The other possibility is belief in control over uncontrollable situations, that is, illusion of control, which can be described as "an expectancy of personal success inappropriately higher than the objective probability would warrant" (Langer, 1975, p 316). Among those holding such illusions, the rationality of the decision-making process required during gambling is compromised by cognitive distortions. Examples of behaviours among gamblers which suggest that these distortions may be occurring are talking to the machines, blowing on dice, keeping fingers crossed, being encouraged by 'near wins' on lotteries, and having favourite machines or tables (Coulombe, Ladouceur, Desharnais, & Jobin, 1992; Dumont & Ladouceur, 1990; Griffiths, 1990, 1993; Reid, 1986). Frank and Smith argue that illusion of control results in persistence (in the face of inevitable failure), and superstitious behaviours such as those noted above. It is predicted that belief in control over winning (as opposed to playing) in gambling will be associated with problem gambling status.

It could be argued that another form of perceived control -- adopting a 'system' for winning -- also fits this category of superstitious belief, given the

persistent unreliability of most affordable systems. However systems may be based on logical premises, building on the fact that all types of gambling have some fixed, non-random parameters. Some systems are clearly illusory, others are not (Mobilia, 1993). Rosecrance (1988) argues that belief that winning at gambling may be determined by the application of some skill or system is a risk factor for problem gambling. Thus it is predicted that there will be an association between belief in systems and problem gambling among young people.

There is less discussion in the literature about the use of gambling as a means of getting one's life or finances back under control. Lesieur's (1988) study of female pathological gamblers, for example, suggested that many of these women were disadvantaged economically and gambled in a futile attempt to alleviate their economic situation. Brown and Coventry (1997), also studying women gamblers, argued that gambling can provide through the hope of winning, an enhanced sense of control over life among a group characterised by low power and influence. It is predicted therefore, that individuals who express stronger needs to access finance through gambling in order to manage their lives, will be more vulnerable to problem gambling than those who perceive these needs less strongly.

In summary, the aim of this study was to assess the association between a range of beliefs about control and problem gambling among young people. The role of control beliefs in the prediction of gambling frequency (as distinct from problem gambling), was also explored, as these variables are likely to be related, especially among young people for whom access to finance is probably limited. Those in the 14 to 25 year age range were chosen as the focus of this study because of the importance of early identification of actual and potential problem gamblers. Various studies have suggested that many pathological gamblers start their gambling at an early age (Dell, Ruzicka, & Palisi, 1981; Wynne, Smith, & Jacobs, 1996), leading to an international upsurge of interest in the topics of children and youth gambling (eg., Derevensky, Gupta, & Della-Cioppa, 1996; Stinchfield, Cassuto, Winters, & Latimer, 1997). While adults are more likely to

be problem gamblers than young people (because of increased access to gambling venues and greater financial resources) the isolation of risk factors in problem gambling among the young raises the possibility of development of school- and college-based preventive programs. In addition, previous studies suggest the vulnerability of young people to 'magical thinking' about luck (Griffiths, 1990) , and note their tendency for risk-taking of various kinds (Bell & Bell, 1993).

Method

Participants

The sample comprised 1017 young people aged between 14 and 25 years (435 males; 577 females, 5 unreported gender). Participants were volunteers from Years 10, 11 and 12 of six secondary schools and first year undergraduates from four geographically separate campuses of a university in Melbourne, Australia. The university and the schools were all situated in the western suburbs of Melbourne, a predominantly working class area. This area was targeted because of concerns which have been expressed about the high frequency of gambling venues available in these suburbs in comparison with more affluent areas of the city (Coward, 1998). Useable data was obtained from 344 boys and 413 girls in the school sample and 86 men and 164 women in the university sample. The mean ages of the samples were as follows: School sample 16.3 years (sd = 1.2 years); University sample 19.2 years (sd = 1.8 years); Total sample 17.0 years (sd = 1.9 years).

Materials

Gambling frequency. This was assessed through frequencies of 10 different types of gambling, for example, playing cards, using poker machines, buying lottery tickets. The rating scale for each type of gambling ranged through 0= never participated, 1= once a year, 2= more than once/year. less than once/month, 3= more than once/month but less than once/week, to 4= once a week or more.

The range of scores was 0 to 40, with high scores representing higher frequencies of gambling. The Cronbach alpha reliability coefficient for the scale was 0.71.

Problem Gambling. A modified version of the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987) was used as the measure of problem gambling, with statements in the screen adapted to the Australian idiom and to the age of the population. A major change was that a 5-point Likert scale (strongly agree to strongly disagree) was applied to the problem gambling statements, first to allow for a more fine grained set of responses than required by the original Yes/No format, and second to maintain consistency in response requirements across the questionnaire. Ratings across the 10 items were added to form a measure with a possible range of scores of 10 to 50, high scores representing higher levels of perceived problem gambling. The Cronbach alpha for this modified scale was 0.87. (Copies available from the first author.)

Beliefs about control. Nineteen statements were developed relating to the various senses of 'control over gambling' discussed in the introduction. Item content is indicated in Table 1. Participants were required to respond to these statements on a rating scale from strongly agree (=5) to strongly disagree (=1). Items were factor analysed, and the outcome is described in the results section.

Procedure

The research was scrutinised and approved by the Human Ethics Committee of the authors' employing institution. For the school sample permission to approach schools was obtained from the relevant state body. Ten western suburbs principals were requested to allow the research to proceed in their schools and permission/access was obtained in six of these schools. One class at each of years 10, 11, and 12 was surveyed. Students under 18 were given parental permission slips to be returned confirming approval to participate in the study. Volunteer students with parental permission (for the under 18s) were surveyed in class groups, while non-participating students within the class either

engaged in other work or went to the library. The survey took 30 to 40 minutes to complete, and was anonymous. Teachers administered the survey after consultation with the project's research assistant. The university sample was recruited by the research assistant who called for volunteers in large first year lecture groups across four geographically distinct campuses of the university. Students who volunteered either took the questionnaires and returned them the following week, or completed them on the spot at the end of the lecture.

Results

Gambling behaviours of the sample

The mean score on the gambling frequency scale (potential range 0 - 40), was 6.3 (sd = 5.2), suggesting on average, familiarity with gambling among the sample but not high frequencies for the most part. Over 90 per cent of the sample scored greater than zero on this scale, indicating that they had gambled at some time or other. Males gambled more frequently than females (Males: \underline{M} = 7.3; Females: \underline{M} = 5.6; \underline{F} (1, 1008) = 27.58, $p < 0.001$).

The mean score on the problem gambling scale (potential range 10 - 50), was 15.5 (sd = 7.3), suggesting that while many young people had no problems with their gambling, the range of responses was wide enough to indicate disquiet about gambling among a significant number of the sample. Males scored significantly higher on this scale than females (Males: \underline{M} = 17.4; Females: \underline{M} = 14.0; \underline{F} (1,1008) = 57.49; $p < 0.001$). It is worth noting that scores on this problem gambling scale provide a continuous measure appropriate for use in the regression analyses to follow. They do not however provide a clear indication of the cut-off point for definition of a problem gambler. To do this, the continuous scale scores were transformed to a similar format to that represented in the South Oaks Gambling Screen. Problem gambling responses were converted to a Yes/No format by collapsing agree and strongly agree statements into the 'Yes' category. Subjects with 5 or more 'Yes' responses to the 10 problem gambling items were classified as problem gamblers, in accordance with standard practice

for the SOGS (Lesieur & Blume, 1987). Scores of 0 or 1 were defined as reflecting few or no gambling problems, and scores of 2 to 4 as potential mild-to-moderate problems in accordance with the work of Gambino et al. (1993).

The resulting data indicated that a small percentage of young people (3.8 % ; N=39) scored 5 or more, that is, could be classified as problem gamblers. Scores between 2 and 4 (potentially mild-to-moderate problems) were obtained by a further 10.8 per cent (N = 109). The majority of young people scored between zero and 1, that is, exhibited none or few gambling-related problems. Further details of the gambling behaviours of this sample have been reported in detail elsewhere (Moore & Ohtsuka, 1997).

Beliefs about Control

Table 1 shows the frequency of young people who agreed with each of the 'control' statements. A major point to note is the high agreement rates for statements about rational control of gambling - being able to start and stop at will, and stick to a budget. Alongside these data however there were small but significant percentages of young people who held superstitious ideas about luck and high expectations of winning, presented the need for money as a reason for gambling, and believed they could 'beat the system'.

Insert Table 1 about here

Factor Analysis/Scaling

Factor analysis of the control items, using principal components analysis with varimax rotation, produced five factors with eigen values greater than one. This solution accounted for 63.3 per cent of the variance of the control items, and created conceptually meaningful factors which are also shown in Table 1. These were: Illusion of Control; Need Money; Control over Gambling; Belief in Systems; and Cynicism about Winning. The per cent of variance accounted for by each

factor was 31.3%, 13.2%, 7.7%, 5.6%, and 5.6% respectively. Table 1 shows the highest factor loading for each item, with items grouped accordingly.

For each factor, a scale was developed by adding the ratings on each item comprising the factor. The Illusion of Control scale assessed optimistic views about winning and the belief in luck and other superstitious behaviours. The Need Money scale reflected an expressed importance of winning money to shore up finances. Control over gambling measured perceptions of rational control over whether and when to gamble -- a kind of internal locus of control with respect to gambling. Young people who believed that systems were useful as techniques for winning at gambling scored higher on the Belief in Systems scale, and finally, Cynicism about Winning was a scale reflecting perceptions that the chances of winning at gambling were low. High scores on each scale represent stronger beliefs with respect to the named variable. Possible score ranges vary due to the variable number of items across scales. The alpha reliabilities for the five scales were: Illusion of Control 0.85; Need Money 0.80; Control over gambling 0.83; Belief in Systems 0.80; Cynicism about Winning 0.53. The low alpha for the Cynicism scale indicates that results obtained for this scale need to be viewed with caution. All other reliabilities were considered adequate.

Sex & Age Differences in Control Beliefs

Two-way anovas were conducted on the scale scores to assess age and sex differences on each of the control measures. Males and younger adolescents had stronger illusions of control (Sex: $F(1,1028) = 10.07$, $p < 0.01$; Age: $F(1,1028) = 6.00$, $p < 0.05$), were more likely to claim the need for money as a reason for gambling (Sex: $F(1,1028) = 18.85$, $p < 0.001$; Age: $F(1,1028) = 8.33$, $p < 0.01$), were less cynical about winning (Sex: $F(1,1028) = 12.46$, $p < 0.001$; Age: $F(1,1028) = 8.75$, $p < 0.01$), and showed a non-significant trend toward stronger beliefs in their abilities to 'beat the system' (Sex: $F(1,1028) = 3.30$, $p < 0.1$; Age: $F(1,1028) = 2.99$, $p < 0.1$). Younger adolescents expressed lower perceived control over gambling ($F(1,1028) = 4.54$, $p < 0.05$), but there were no significant

differences between the sexes on this variable. There were no significant interactions between age and sex on the control variables, with younger age and male sex working independently as risk factors for potential problem gambling.

Relationships between gambling behaviour and control beliefs

Correlations between gambling frequency, problem gambling, and control belief scales were calculated separately for males and females (Table 2).

Insert Table 2 about here

Table 2 shows that gambling frequency and problem gambling in young men and women were associated with the three scales assessing less rational control beliefs, that is, greater illusion of control, a stronger need to win money at gambling, and a stronger belief in being able to 'beat the system'. The associations of these beliefs were much stronger with problem gambling than with gambling frequency. These three sets of beliefs were also strongly interrelated with one another. The more rational control beliefs - control over gambling (playing) and cynicism about winning were weakly correlated with one another, and negatively associated with problem gambling for young women only. Cynicism about winning had a negative relationship with gambling frequency for young men only. For both sexes, those who gambled more tended to believe they had more control over their gambling. Gambling frequency was significantly associated with problem gambling, although the correlations were quite low. In summary, it appears that irrational beliefs support increased gambling, and are strong risk factors for problem gambling, especially when rational control is low. A healthy (and realistic) cynicism about winning appears a good protective factor, although it works differently for males than females.

Regression analyses were conducted, separately for males and females, to assess the relative importance of the control belief scales in predicting gambling

frequency and problem gambling and the percent of variance accounted for by this set of variables (See Table 3).

Insert Table 3 about here

Gambling frequency was significantly predicted by control beliefs for both males and females, with 15 and 12 per cent of the variance accounted for respectively. For boys, strongest predictors of gambling frequency were high scores on Illusion of Control and Control over Gambling and lower scores on Cynicism about Winning. For girls, Illusion of Control and Control over Gambling were the strongest predictors of gambling frequency.

Problem gambling was significantly predicted by control beliefs with quite high percentages of the variance accounted for -- 37 per cent for boys and 28 per cent for girls. High scores on the Need Money and Belief in Systems scales were strong predictors of problem gambling for both boys and girls. In addition, low Cynicism about Winning predicted problem gambling for girls.

Discussion

In this sample of working class/lower middle class young people, gambling was wide-spread enough to enable a study of the role of control beliefs in predicting gambling frequency and problem gambling. Around 90 per cent of the sample had experienced gambling at least once. Although problem gambling rates were low, over 10 per cent of these young people indicated at least some concerns about controlling their gambling. A significant proportion held illusions of control over winning, for example believed that they might be able to 'will' their lucky numbers to come up or that concentration or thinking positively might facilitate their winning at games of chance. These beliefs were more common in younger adolescents and among males, as were expressions of

‘needing’ to win at gambling for financial reasons. Balancing these distorted views of control, some two-thirds of the sample believed they had rational control over gambling, that is, could stop and start when they chose, and stick to a budget. In addition, cynicism about winning was quite high, especially among females and older adolescents. Young men in particular appeared to be quite naive about gambling in the sense of having over-inflated views about their chances of winning and their role in making winning occur. This is reflected in their higher frequencies of gambling and much higher rates of problem gambling than among young women.

Internal locus of control with respect to gambling, which was operationalised in this study by the Control over Gambling scale was, interestingly, associated with greater frequency of gambling for both sexes. This result may reflect the low levels of exposure to gambling of many of the sample, so that they do not really have enough experience to know whether their control mechanisms are adequate or not. One reason for avoiding gambling altogether may be (untested) fears about loss of control. On the other hand, those with relatively higher levels of exposure (in a sample with few problem gamblers) may be more aware of their ability to ‘take it or leave it’. The predicted negative relationship between Control over Gambling and problem gambling was evident for females only, and the relationship, while statistically significant, was weak. This could suggest that at least some young problem gamblers, particularly the males, are poor at self-assessment of their abilities to control gambling -- a speculation which could be followed up in further research. Implications for both interventions and preventive education revolve around increasing self understanding and acceptance of the nature of loss of control and ways to guard against it.

For both sexes, Control over Gambling was related to Cynicism about Winning, an apparent protective factor against high levels of gambling/problem gambling. This result also has educational implications. There would seem to be value in presenting adolescents with educational material which includes

rational information about the nature of luck and chance, and the odds of winning at gambling. Although we know that information alone is not always enough to change behaviour, especially when that behaviour has an obsessional or high arousal value, the importance of dispelling myths about gambling before behaviours become entrenched would seem important. Some studies have suggested that adult gambling problems are related to age at which gambling begins, with adolescent and even childhood initiations being common among problem gamblers (Fisher, 1993; Lesieur & Kline, 1987).

The strongest findings of the study concerned the complex of irrational beliefs which were related to gambling behaviour for both sexes. The scales Illusion of Control, Need Money, and Belief in Systems were an inter-related complex which in turn strongly predicted problem gambling and to a lesser extent gambling frequency. These results are consistent with past research. Ladouceur and his colleagues (Ladouceur, Gaboury, Dumont, & Rochette, 1988) showed irrational thinking about the events involved in gambling choices was more prevalent among adult problem gamblers than among occasional gamblers. The myth that the outcome of poker machine gambling could be influenced by a particular style of playing existed among youthful gamblers in Griffiths' (1990) British study of 8 self-confessed young poker machine addicts. Frank and Smith (1989) conducted an experimental study demonstrating that children believed that practice would improve their performance in guessing the (chance) outcome of penny tossing. Several theorists (eg., Frank & Smith, 1989; Walker, 1985) have argued that the attribution of control over chance events is the key to understanding persistence of gambling behaviour. Wagenaar (1988) in a review of gambling behaviour research suggested that people find it very difficult to accept the probabilistic, chance nature of many events, and are reluctant to exclude the role of skill. Gaming venues are not averse to building factors into the gambling situation which encourage this illusion.

Among the boys and girls in our study, problem gamblers were more likely to hold superstitious beliefs about winning and the influence of their own

behaviour in controlling chance outcomes. In addition, young people who scored higher on the problem gambling scale were more likely to believe they needed money (and gambling might provide a way to get it). The relatively powerless status of student adolescents, as they struggle with issues of independence yet are constrained in situations where financial independence is unlikely, may be a risk factor for problem gambling in itself, in the same way as Brown and Coventry argue that women's low power in the community makes them vulnerable to unhealthy gambling habits. Individuals wrestling with difficult life-control issues may use fantasies of winning as a way of coping. Combine such fantasies with illusions of control, readily accessible and attractive gambling facilities, and relative social support of gambling as a leisure activity, and the potential is there for problems to develop. As well, the fantasy of escaping from financial difficulty by outsmarting the system may have been an important motivator toward gambling for these young people. In line with the work of Rosecrance (1988), young problem gamblers had more faith in gambling systems and their abilities to 'beat the system'.

The study is limited in the extent to which findings can be applied to either youth or problem gamblers in general, because of sample limitations in both socio-economic status and age range. The percent of actual and potential problem gamblers in the sample was not high, however most of the sample had tried gambling at least once and so were likely to have formed beliefs about this activity. That some of these beliefs were clearly irrational indicates that at least some vulnerability factors in relation to adult problem gambling can be isolated early. Such factors could be amenable to change through early intervention.

In summary, this study described and measured several senses of the term 'control' when applied to gambling, and showed that these several senses were independently important predictors of problem gambling tendencies in young people, and to a lesser extent, gambling frequency. Confusions between real control and illusions of control need to be dispelled in any interventions or educational programs about gambling. The ideas of 'control over playing', 'control

over winning' and 'control over life/finances', could form the basis of an educational program for young people with the aim of reducing the extent of both initiation into gambling and problem gambling in this age group.

References

- Bell, N. J. & Bell, R. W. (Eds). (1993). Adolescent risk taking. Newbury Park, Cal.: Sage.
- Brown, S., & Coventry, L. (1997). Queen of hearts: The needs of women with gambling problems. Melbourne: Financial and Consumer Rights Council.
- Corless, T. & Dickerson, M. (1989). Gamblers' self perceptions of the determinants of impaired control. British Journal of Addiction, 84, 1527-1537.
- Coulombe, A., Ladouceur, R., Desharnais, R., & Jobin, J. (1992). Erroneous perceptions and arousal among regular and occasional video poker players. Journal of Gambling Studies, 8, 235-244.
- Coward, S. (1998, September). Regional forum on convenience gambling. Maribyrnong, Victoria, Australia: Maribyrnong City Council.
- Davis, W. L. & Phares, E. J. (1967). Internal-external locus of control as a determinant of information seeking in a social influence situation. Journal of Personality, 35, 547-561.
- Dell, L., Ruzicka, M. F., & Palisi, A. T. (1981). Personality and other factors associated with the gambling addiction. International Journal of Addictions, 16, 149-156.
- Derevensky, J., Gupta, R., & Della-Cioppa, G. (1996). A developmental perspective on gambling behavior in children and adolescents. Journal of Gambling Studies, 12, 49-66.
- Dumont, M. & Ladouceur, R. (1990). Evaluation of motivation among video players. Psychological Reports, 66, 95-98.
- Fisher, S. (1993). Gambling and pathological gambling in adolescents. Journal of Gambling Studies, 9, 277-288.
- Frank, M. L. & Smith, C. (1989). Illusion of control and gambling in children. Journal of Gambling Behavior, 5, 127-136.

Gambino, B., Fitzgerald, R. Shaffer, H., Renner, J., & Courtage, P. (1993). Perceived family history of problem gambling and scores on SOGS. Journal of Gambling Studies, 9, 169-184.

Griffiths, M. (1990). The cognitive psychology of gambling. Journal of Gambling Studies, 6, 31-42.

Griffiths, M. (1993). Factors in problem adolescent fruit machine gambling. Journal of Gambling Studies, 9, 31-45.

Kusyszyn, I. & Rubenstein, L. (1985). Locus of control and race track betting behaviors: A preliminary investigation. Journal of Gambling Behavior, 1, 59-63.

Ladouceur, R., Gaboury, A., Dumont, M., & Rochette, P. (1988). Gambling: relationship between the frequency of wins and irrational thinking. Journal of Psychology, 122, 409-414.

Langer, E. J. (1975). The illusion of control. Journal of Personality and Social Psychology, 32, 311-328.

Langer, E. J. & Roth, J. (1975). Heads I win, tails it's chance: The illusion of control as a function of the sequence of outcomes in a purely chance task. Journal of Personality and Social Psychology, 32, 951-953.

Lesieur, H. R. (1988). The female pathological gambler. In: W. R. Eadington (Ed.) Gambling studies: Proceedings of the 7th International Conference on Gambling and Risk Taking. Reno, Nevada: University of Nevada.

Lesieur, H. R. & Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): A new instrument for identification of pathological gamblers. American Journal of Psychiatry, 144, 1184-1188.

Lesieur, H. R. & Kline, R. (1987). Pathological gambling among high school students. Addictive Behaviors, 12, 129-135.

Mobilia, P. (1993) Gambling as a rational addiction. Journal of Gambling Studies, 9, 121-152

Moore, S. M., & Ohtsuka, K. (1997). Gambling activities of young Australians: Developing a model of behaviour . Journal of Gambling Studies, 13 (3), 207 -236.

Reid, R. L. (1986). The psychology of the near miss. Journal of Gambling Behavior, 2, 32-39.

Rosecrance, J. (1988). Gambling without guilt: The legitimation of an American pastime. Belmont, CA: Brooks/Cole Publishing.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 80, No. 1 (Whole No. 609).

Seligman, M. E. P. (1975). Helplessness. San Francisco: W. H. Freeman.

Stinchfield, R., Cassuto, N., Winters, K., & Latimer, W. (1997). Prevalence of gambling among Minnesota public school students in 1992 and 1995. Journal of Gambling Studies, 13, 25-48.

Wagenaar, W. A. (1988). Paradoxes of gambling behavior. Hove and London, England: Erlbaum.

Walker, M. (1985). Explanations for gambling. In G. T. Caldwell, M. G. Dickerson, B. Haig, and L. Sylvan (Eds.) Gambling in Australia. Sydney: Croom Helm (pps.153-157).

Wynne, H., Smith, G., & Jacobs, D. F. (1996). Adolescent gambling and problem gambling in Alberta. Edmonton, Alberta: Alberta Alcohol and Drug Abuse Commission.

Zenker, S. I. & Wolfgang, A. K. (1982). Relationships of Machiavellianism and locus of control to preferences for leisure activity by college men and women. Psychological Reports, 50, 583-586.

Table 1: Percent agreement with control statements and factor loadings

| Beliefs | %agree | Factor loading |
|---|--------|----------------|
| Factor 1: Illusion of Control | | |
| 8. The chances of winning a substantial amount of money at the Casino are quite high | 15.5 | .44 |
| 9. I think I'll win a good prize in Tattslotto (over \$10,000) one day | 16.6 | .76 |
| 11. One day I'm going to strike it lucky at gambling | 13.7 | .75 |
| 12. Sometimes I think I might have the power to 'will' my numbers to come up in gambling games | 8.4 | .65 |
| 13. To win at gambling you need to think positively | 19.0 | .63 |
| 14. If I concentrated hard enough I might be able to influence whether I win when I play the pokies | 6.9 | .60 |
| 15. I'm more likely to win at lotto/gambling if I use my 'lucky numbers' | 10.0 | .60 |
| Factor 2: Need Money | | |
| 16. I need to win some money to balance my budget | 10.5 | .76 |
| 17. The only way I'll ever get ahead is if I win a decent prize gambling | 7.6 | .77 |
| 18. Winning at gambling is important to me | 8.9 | .74 |
| 19. I wouldn't mind losing \$100 at the pokies, because I could win it back another day | 6.5 | .61 |
| Factor 3: Control over gambling | | |
| 1. I believe I can completely control the amount I gamble | 69.0 | .88 |
| 2. I can/could stick to a budget when/if I gamble | 68.5 | .87 |
| 4. I could stop gambling any time I want to | 72.5 | .81 |
| Factor 4: Belief in systems | | |
| 5. You can win at the pokies if you adopt the right system | 10.1 | .82 |
| 6. You can 'beat the system' at the Casino in you know how | 11.1 | .83 |
| Factor 5: Cynicism about winning | | |
| 7. The likelihood of winning a large amount of money is so small it's not worth bothering | 45.4 | .74 |
| 10. The only way I will ever make money is to work for it | 78.5 | .68 |
| 20. I can't afford to gamble | 49.4 | .69 |

Table 2: Correlation matrix between control variables, gambling frequency, and problem gambling (male correlations above and female correlations below the diagonal)

| | Gambling frequency | Problem gambling | Illusion of control | Need money | Belief in systems | Control over gambling | Cynicism about winning |
|---------------------------|-----------------------|---------------------|------------------------|---------------|----------------------|-----------------------------|------------------------------|
| Gambling frequency | | .27*** | .30*** | .19*** | .10* | .16*** | -.22*** |
| Problem gambling | .22*** | | .50*** | .57*** | .46*** | -.02 | -.09 |
| Illusion of control | .25*** | .37*** | | .69*** | .53*** | .03 | -.08 |
| Need money | .13*** | .49*** | .59*** | | .46*** | -.09 | -.09 |
| Belief in systems | .10* | .31*** | .51*** | .41*** | | .11* | -.05 |
| Control over gambling | .24*** | -.10* | -.01 | -.09* | .05 | | .18*** |
| Cynicism about winning | -.02 | -.21*** | -.13** | -.11** | -.15*** | .26*** | |

Table 3: Regressions: Prediction of gambling frequency and problem gambling from control measures

| | Gambling frequency betas | | Problem Gambling betas | |
|--------------------------------|-----------------------------|----------|------------------------|----------|
| | Males | Females | Males | Females |
| Illusion of Control (IC) | .28*** | .26*** | .10 | .06 |
| Need Money (NM) | .03 | .02 | .39*** | .40*** |
| Control over Gambling (CG) | .20*** | .27*** | .00 | -.03 |
| Belief in Systems (BS) | -.08 | -.06 | .22*** | .10* |
| Cynicism about Winning (CW) | -.24*** | -.07 | -.03 | -.13** |
| Adjusted R-square | .15 | .12 | .37 | .28 |
| F | 15.80*** | 16.27*** | 51.36*** | 44.33*** |

Notes: +p< .10; * p< .05; ** p< .01; *** p<.001

Footnotes

¹ Acknowledgments: Funding for this project was provided by the Australian Research Council. Thanks to Karen Trevorrow for her research assistance.

2 Now at Swinburne University of Technology

Correspondence should be addressed to

Professor Susan Moore
Faculty of Life and Social Sciences
Swinburne University of Technology
PO Box 218
Hawthorn, VIC 3122
AUSTRALIA

Telephone: +61 3 9214 5694
E-mail: smoore@swin.edu.au

Or

Dr Keis Ohtsuka
School of Psychology
Victoria University (F089)
Melbourne, Vic 8001

E-mail: keis.ohtsuka@vu.edu.au