

HEALTH-RELATED CORRELATES OF GAMBLING ON THE BRITISH NATIONAL LOTTERY^{1,2}

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Summary.—The National Lottery has been estimated as being played by 65% of the adult British population. This study investigated whether higher average weekly spending on the Lottery is associated with various health-related variables. Results from a survey of 482 British adults (mean age = 33.3 yr.), consisting of 107 students and 375 people in employment, indicated that those who spent more on the Lottery had significantly poorer social functioning (Social Functioning scale of the SF-36 Health Survey), higher weekly alcohol and cigarette consumption, and lower frequency of social support (Emotional and Social Interaction scales of the Medical Outcomes Study Social Support Survey). By contrast, higher lottery spending was not associated with poorer general mental health (General Health Questionnaire). Manual workers spent over twice the weekly amount on the Lottery compared to nonmanual workers. Consumption of alcohol and cigarettes was lower than recently published UK norms. Results suggest that higher Lottery spending among the general adult population possibly may be linked specifically to restrictions in social activity. The association of Lottery spending with alcohol and cigarette use among a sample whose consumption was relatively low appears to require explanation within psychological theories of addiction. The over-all pattern of results is discussed in relation both to addiction theory and to the Lottery's widespread appeal and availability.

The British National Lottery was launched in November, 1994, and is now the largest lottery in the world. It is played regularly by about 65% of the adult British population, and around 90% have played at least once (Camelot, 1997). About 28% of sales from the National Lottery are distributed to charitable causes, and this has raised £4.2 billion (\$6.5 billion) since its launch (Camelot, 1997). The Lottery appears to be perceived positively by most people, perhaps because it is linked with charitable causes (Griffiths, 1997a) and because participation is widespread and probably viewed as socially acceptable (Hill & Williamson, 1998). However, the general opinion that the National Lottery is 'a good thing' (Griffiths, 1997a, p. 23) may have diverted attention away from investigating health-related variables that could be associated with this relatively new form of gambling in the UK.

It is well established that pathological (compulsive) gambling is associ-

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ated with ill health. A positive association between pathological gambling and depression has been found consistently (Lesieur, 1989). Becoña, Lorenzo, and Fuentes (1996), for example, found that the severity of pathological gamblers' depression was positively associated with the severity of their gambling addiction. Moreover, consistently higher depression has been found for patients treated for gambling addiction than for control groups of patients treated by family physicians (Blaszczynski & McConaghy, 1988, 1989). Pathological gambling has also been positively associated with behaviors that compromise health, such as drug use (Griffiths, 1994), high rates of alcohol use (Becoña, 1993; Murray, 1993; Bergh & Kuhlhorn, 1994), and cigarette consumption (Becoña, 1993).

Few studies have examined the association between health-related variables and gambling in the general adult population. One study that examined an adult population in the United States (Thorson, Powell, & Hilt, 1994) found no relationship between depression and various forms of gambling (including lottery play). Nevertheless, some authors have argued that the sheer scale of public participation in the British National Lottery (Griffiths, 1997a, 1997b, 1997c), and the vast expenditure—over £100m a week is gambled—gives it the potential to have a major influence on the Nation's health (McKee & Sassi, 1995). One concern raised, for example, centers on participation by children and adolescents in the Lottery, which could lead to gambling problems for these groups in later life (Griffiths, 1997a, 1997b). Another concern raised is whether the Lottery could widen health inequalities, in that it tends to gather money from the poorer groups in British society (McKee & Sassi, 1995; see also Camelot, 1997). Indeed, there is substantial evidence that social inequalities in income distribution are associated with social inequalities in morbidity and life expectancy (Wilkinson, 1992, 1994; Davey Smith, 1996; Lynch & Kaplan, 1997).

Given the concerns raised, it seems timely to investigate health correlates of gambling in the context of the British National Lottery. Taking account of the World Health Organization's definition of health as a state of psychological, physical, and social well-being (Bowling, 1997), this study investigated whether higher average weekly spending on the Lottery was associated with general mental health, social functioning, frequency of social support, and substance use (alcohol and cigarette consumption and drug use).

METHOD

Participants and Procedure

An opportunity sample of 780 adults were asked to complete a questionnaire providing information on various demographic characteristics, recent health, and health behaviors. Completed questionnaires were received from 482 people (183 men and 299 women), a response rate of 61.8%. The

mean ($\pm SD$) age of respondents was 34.5 ± 11.5 yr., for men, and 32.6 ± 11.6 yr., for women. A minority (22.2%) were students attending the authors' university. The remaining 77.8% were recruited from a variety of employers in central London (UK). A letter explaining the aims of the study was mailed to 40 randomly chosen organizations. Sixteen agreed to let us issue and collect questionnaires from their employees at their places of business. The organizations agreeing to participate ranged in size from approximately 20 to 100 employees. Approximately two-thirds of the sample were employed in white collar jobs, with the remainder in blue collar jobs. The social class characteristics of the sample differ from that of the wider UK population (see Office of National Statistics, 1998) in that a disproportionately high percentage of respondents were nonmanual workers. This may reflect a class bias in participating in health surveys, which appears to be evident in other UK studies (e.g., Jenkinson, Coulter, & Wright, 1993).

Questionnaire

Demographic characteristics assessed were age, sex, ethnicity (white versus nonwhite), annual earnings, and social class (manual worker versus nonmanual worker) coded on the basis of the respondent's occupation (Office of National Statistics, 1998). Health behaviors assessed were cigarette consumption (average number of cigarettes smoked per day), alcohol consumption (units of alcohol consumed in the preceding week), and drug use (ever used versus never used for recreation). Other sections of the questionnaire included the 12-item General Health Questionnaire (Goldberg & Williams, 1988), the Social Functioning scale of the UK version of the SF-36 Health Survey (Ware, Snow, Kosinski, & Gandek, 1993) and the Emotional and Positive Social Interaction scales of the Medical Outcomes Study Social Support Survey (Sherbourne & Stewart, 1991). The General Health Questionnaire assesses current mental health; the Social Functioning scale assesses the extent to which physical or emotional problems have recently interfered with normal social activities; and the Social Support Survey assesses frequency of social support. Validation studies indicate that these inventories all have high reliability and validity (McDowell & Newell, 1996).

Analysis

Seven items from the Social Support Survey concerning frequency of different types of support were factor analyzed by principal components analysis without rotation to discern if there was an underlying variable for which scores could be used in the subsequent regression analysis. A general linear model (SPSS Version 7.0) was constructed to explore determinants of weekly spending on the National Lottery. Lottery spending was modeled in terms of age, sex, social class (nonmanual versus manual), ethnic group (white versus nonwhite), general mental health, social functioning, number

of cigarettes smoked per week, units of weekly alcohol consumption, earnings, and drug use (ever used versus never used for recreation). Social support variable(s) to emerge from the factor analysis were also added. Where the analysis indicated significant effects for the demographic variables, these were further examined by computing adjusted means to highlight the size of any demographic differences in weekly Lottery spending.

RESULTS

Descriptive Statistics

This study investigated whether higher spending on the National Lottery was associated with various health-related variables. One issue we wished to investigate was whether higher Lottery spending is associated with increased but nonpathological amounts of current alcohol and cigarette consumption. The descriptive statistics for alcohol and cigarette consumption are given in Table 1.

TABLE 1
DESCRIPTIVE STATISTICS FOR ALCOHOL* AND CIGARETTE CONSUMPTION

Variable	Sex	<i>n</i>	<i>M</i>	<i>SD</i>
Alcohol Consumption Over-all, number of units consumed in the past week	Male	183	11.1	10.4
	Female	299	7.0	8.4
Drinkers Only, number of units consumed in the past week	Male	164	12.2	10.2
	Female	261	8.0	8.6
Smoking Prevalence, % of respondents who smoke regularly	Male	183	40.0	
	Female	299	33.0	
Cigarette Consumption in Current Smokers, number smoked per day	Male	73	14.3	11.4
	Female	99	9.2	9.1

*One unit = 1 glass of wine or spirits, or half a pint of average strength beer.

Factor Analysis

Mean sampling adequacy for the analysis was excellent ($MSA = 0.89$). Only one factor with eigenvalues in excess of 1.00 emerged from the analysis, and it accounted for 68% of the variance.

Linear Modeling

The average weekly amount spent reportedly on the National Lottery was $\pounds 1.15 \pm \pounds 2.43$. Although the data were skewed, it was decided not to attempt transformation of the scale. If a scale is widely understood and meaningfully interpreted—and we suggest that pounds sterling meets these criteria—transformation can hinder interpretation (Tabachnick & Fidell, 1996).

Raw correlations indicated that higher spending on the Lottery was unrelated to use of drugs, ethnicity, annual earnings, sex, and general mental health. However, increased spending was related to older age, greater alcohol and cigarette consumption, poorer social functioning, lower frequency of social support, and manual social class. With the exception of the correlation between Social Functioning and Mental Health ($r = .51$), the independent variables were not strongly intercorrelated. When entered simultaneously into a regression, the variables accounted for a quarter of the variance in Lottery spending, with several significant predictors (see Table 2). Calculation of adjusted means indicated that manual workers spent £3.40 per week on the Lottery, whilst nonmanual workers spent only £1.50 per week.

TABLE 2
LINEAR MODELING OF LOTTERY SPENDING* †

Variable	Beta	p
Social Class	.20	< .005
Age	.15	< .01
Cigarette Consumption	.31	< .0001
Alcohol Consumption	.14	< .05
Ever Used Recreational Drugs	.15	< .01
Social Support	.13	< .05
Social Functioning	.15	< .05

* $R^2 = 0.26$, $F_{11,285} = 10.31$, $p < .0001$ (Method = Standard).

†Ethnicity, earnings, general mental health, and sex were not significant predictors of Lottery spending in the model.

DISCUSSION

The present study showed that higher spending on the British National Lottery was associated with poorer social functioning, lower frequency of social support, and higher alcohol and cigarette consumption. Higher spending was also associated with older age and manual social class, a finding that is consistent with previously published data on National Lottery players (Camelot, 1997). By contrast, there was no association between higher spending and annual earnings, use of drugs, general mental health, ethnicity, or sex.

Why should higher spending be associated with poorer social functioning (specifically, restricted social activity due to emotional or physical problems) but not with poorer general mental health? One reason may be that people whose health specifically restricts their social activity spend more on the Lottery to make up for lack of socializing. Three lines of evidence are consistent with this view. First, the finding that poorer mental health was not associated with increased spending is consistent with Thorson, *et al.* (1994) who found no association between gambling and depression in the

general population. Second, higher spending was also associated with lower frequency of social support (which also can restrict social activity) as measured by the Emotional and Positive Social Interaction scales of the Medical Outcomes Social Support Survey. Third, to the extent that people need to make up for restricted social activity, participation in the Lottery may be a particularly appealing option because it is widely available and potentially arousing (Hill & Williamson, 1998). Whether poorer social functioning or lack of social support are causal or symptomatic of higher Lottery spending is a question that will need to be resolved.

Higher spending on the National Lottery was also associated with greater alcohol and cigarette consumption. The figures given in Table 1 indicate that the mean amount of alcohol consumed in the previous week and the average weekly cigarette consumption are lower than published UK population norms for these variables (see Cox, Huppert, & Whichelow, 1993). The relatively low alcohol and cigarette consumption in our sample may be because the majority were of higher social class, and class is inversely related to level of consumption for both these substances (Cox, *et al.*, 1993).

A growing body of research has highlighted the problem of coincident substance and gambling addiction (Murray, 1993; Griffiths, 1994). Noting the similarities between gambling and substance addictions, some writers (e.g., Griffiths, 1994) have attempted to explain gambling addiction within a more general framework of psychological addiction. The results of the present study suggest that any such framework would need to explain why the association between Lottery play and substance use is evident even among adults who are, on the average, light drinkers and light smokers. Thus, theorists may wish to analyze not only the similarities between pathological use of substances and gambling (Griffiths, 1994), but also the similarities between moderate use of substances and gambling. Certain features common to Lottery play, drinking, and smoking, e.g., their widespread appeal, potential to arouse or act as a psychological tool to control arousal (cf. Orford, 1985; Ashton & Golding, 1989; Griffiths, 1997a, 1997b, 1997c; Hill & Williamson, 1998), may partly account for their high prevalence and association in the wider adult population.

Although the sample was relatively small and drawn from only one area of the UK (London), the results of the present study are relevant to the wider adult population rather than just to Lottery players. That the sample included nonplayers, i.e., those reported not spending anything, may explain why the over-all average weekly amount spent in this study was just £1.15, in comparison to the average weekly expenditure of £3.30 for Lottery players in the London area (Camelot, 1997).

Clearly, any replication of the present study should include a larger and more representative sample of the British population. Further work could

investigate a wider range of health variables related to Lottery spending and include information about cognitive biases related to regular Lottery participation (Hill & Williamson, 1998). Further work could also target research to a specific population such as older adults. As Lottery spending is associated with older age, one might use a 'life satisfaction' questionnaire, e.g., the Life Satisfaction Inventory (Neugarten, Havighurst, & Tobin, 1961), to investigate whether increased spending is associated with decreased life satisfaction among older adults.

REFERENCES

- ASHTON, H., & GOLDING, J. F. (1989) Smoking: motivation and models. In T. Ney & A. Gale (Eds.), *Smoking and human behaviour*. Chichester, UK: Wiley. Pp. 21-56.
- BECOÑA, E. (1993) The prevalence of pathological gambling in Galicia (Spain). *Journal of Gambling Studies*, 9, 353-369.
- BECOÑA, E., LORENZO, M. D. C., & FUENTES, M. J. (1996) Pathological gambling and depression. *Psychological Reports*, 78, 635-640.
- BERGH, C., & KÜHLHORN, E. (1994) Social, psychological and physical consequences of pathological gambling in Sweden. *Journal of Gambling Studies*, 10, 275-285.
- BLASZCZYNSKI, A., & MCCONAGHY, N. (1988) SCL-90 assessed psychopathology in pathological gamblers. *Psychological Reports*, 62, 547-552.
- BLASZCZYNSKI, A., & MCCONAGHY, N. (1989) Anxiety and/or depression in the pathogenesis of addictive gambling. *The International Journal of the Addictions*, 24, 337-350.
- BOWLING, A. (1997) *Measuring health: a review of quality of life measurement scales*. (2nd ed.) Buckingham, UK: Open Univer. Press.
- CAMELOT GROUP. (1997) *The National Lottery fact file*. Watford, UK: Camelot Group.
- COX, B. D., HUPPERT, F. A., & WHICHELOW, M. J. (1987) *The Health and Lifestyle Survey: seven years on*. Dartmouth, UK: Aldershot.
- DAVEY SMITH, G. (1996) Income inequality and mortality: why are they related? *British Medical Journal*, 312, 987-988.
- GOLDBERG, D. P., & WILLIAMS, P. (1988) *A user's guide to the General Health Questionnaire*. Windsor, UK: NFER-Nelson.
- GRIFFITHS, M. (1994) An exploratory study of gambling cross addictions. *Journal of Gambling Studies*, 10, 371-384.
- GRIFFITHS, M. (1995) *Adolescent gambling*. London: Routledge.
- GRIFFITHS, M. (1997a) The National Lottery and scratchcards. *The Psychologist Bulletin of the British Psychological Society*, 10, 23-26.
- GRIFFITHS, M. (1997b) Taking a chance with our health. *Health Matters*, 29, 12-13.
- GRIFFITHS, M. (1997c) Health and the National Lottery. *Science and Public Affairs*, Spring, 5-7.
- HILL, E., & WILLIAMSON, J. (1998) Choose six numbers, any six numbers. *The Psychologist: Bulletin of the British Psychological Society*, 11, 17-21.
- JENKINSON, C., COULTER, A., & WRIGHT, L. (1993) Shortform 36 (SF 36) Health Survey Questionnaire: normative data for adults of working age. *British Medical Journal*, 306, 1437-1440.
- LESIEUR, H. R. (1989) Current research into pathological gambling and gaps in the literature. In H. R. Shaffer, S. A. Stein, B. Gambino, & T. N. Cummings (Eds.), *Compulsive gambling*. Lexington, MA: Heath. Pp. 225-228.
- LYNCH, J. W., & KAPLAN, G. A. (1997) Understanding how inequality in the distribution of income affects health. *Journal of Health Psychology*, 2, 297-314.
- MCDOWELL, I., & NEWELL, C. (1996) *Measuring health: a guide to rating scales and questionnaires*. (2nd ed.) New York: Oxford Univer. Press.
- MCKEE, M., & SASSI, F. (1995) Gambling with the Nation's health? The social impact of the National Lottery needs to be researched. *British Medical Journal*, 311, 521-522.

- MURRAY, J. B. (1993) Review of research on pathological gambling. *Psychological Reports*, 72, 791-810.
- NEUGARTEN, B. L., HAVIGHURST, R. J., & TOBIN, S. S. (1961) The measurement of life satisfaction. *Journal of Gerontology*, 16, 134-143.
- OFFICE OF NATIONAL STATISTICS. (1998) *Living in Britain: the 1996 general household survey*. London: The Stationery Office.
- ORFORD, J. (1985) *Excessive appetites: a psychological view of addictions*. Chichester, UK: Wiley.
- SHERBOURNE, C. D., & STEWART, A. L. (1991) The MOS Social Support Survey. *Social Science and Medicine*, 32, 705-714.
- TABACHNICK, B. G., & FIDELL, L. S. (1996) *Using multivariate statistics*. (3rd ed.) New York: HarperCollins.
- THORSON, J., POWELL, F. C., & HILT, M. (1994) Epidemiology of gambling and depression in an adult sample. *Psychological Reports*, 74, 987-994.
- WARE, J. E., SNOW, K. K., KOSINSKI, M., & GANDEK, B. (1993) *SF-36 Health Survey: manual and interpretation guide*. Boston, MA: The Health Institute, New England Medical Centre.
- WILKINSON, R. G. (1992) Income distribution and life expectancy. *British Medical Journal*, 304, 165-168.
- WILKINSON, R. G. (1994) Divided we fall: the poor pay the price of increased social inequality with their health. *British Medical Journal*, 308, 1113-1114.

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