

# Impaired control over gambling in gaming machine and off-course gamblers

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## ABSTRACT

**Aim** To investigate and compare subjectively reported impaired control in two forms of gambling: off-course Totalizator Agency Board (TAB) horse/dog racing and electronic gaming machines (EGMs). Additionally, gender differences in EGM play were investigated.

**Design** A survey sample of 84 male TAB gamblers and 137 EGM players (73 females and 64 males) was recruited at gambling sites.

**Setting** Hotels and clubs in Adelaide, South Australia, were used as recruiting venues. Interviews were either conducted on site if there was sufficient privacy, or relocated to nearby cafes.

**Participants** The inclusion criteria were gambling at least weekly and being over the age of 18. Female off-course gamblers were not approached given their scarcity.

**Measurements** A general gambling involvement questionnaire was devised from pilot research. Impaired control was measured using a shortened version of The Scale of Gambling Choices.

**Findings** Impaired control over gambling has a robust factor structure, with little difference between EGM and TAB gamblers. Concurrent validity for the impaired control measure was demonstrated against measures of gambling involvement.

**Conclusion** Impaired control appears to be, in the main, a generic process across these two forms of gambling and for both sexes. Further refinement and application of the concept of impaired control to excessive gambling seems warranted given its strong face, construct and concurrent validity.

**KEYWORDS** Electronic gaming machines, gambling, impaired control, off-course.

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## INTRODUCTION

Impaired control over appetitive behaviours is characterized by people 'often do(ing) things which, apparently, they neither intend nor want to do: in other words, their control...is, in some sense of the word, impaired' (Heather & Robertson 1989, p. 183). Impaired control (or its more deterministic parent term, 'loss of control') has long been central to formulations of heavy drinking (Alcoholics Anonymous 1939; Jellinek 1960; Storm & Cutler 1975; Edwards *et al.* 1977; Heather & Robertson 1989; Heather 1991), and has been applied to excessive

gambling (Corless & Dickerson 1989; Dickerson 1991; Dickerson & Baron 2000) and other examples of behavioural excess (Orford 1985).

Notwithstanding the philosophical and operational difficulties inherent in the concept of impaired control (Chick 1980; Edwards 1982; Heather & Robertson 1989; Davies 1992), the consistency of subjective reports of impaired control provides good face validity for attempts to operationalize the concept across various excessive behaviours (Heather 1991; Dickerson 1991). The dichotomy implied in 'loss-of-control' is absent in formulations where control is conceptualized 'as a continuous variable

reflecting the frequency with which episodes of impaired control occur rather than as existing in an "all-or-none" fashion' (Heather *et al.* 1993).

The volitional issues of being able to resist opportunities to begin a session and to exercise restraint once engaged in the behaviour are central to notions of impaired control. Jellinek (1960), in his taxonomy of 'alcoholism', drew a distinction between loss of control that is essentially an inability to bring a drinking episode to a conclusion, and an inability to refrain from commencing a session. Similarly, Dickerson (1991) has noted that difficulty in maintaining control within a session is quite common in regular gamblers, seemingly more so than across sessions ('inability to refrain'). However, Kahler, Epstein & McCrady (1995) concluded, on the basis of interviews with 'alcoholics' receiving treatment, that an inability to stop (Jellinek's 'loss of control') and an inability to refrain are not independent constructs, with items from both loading on a single factor ('loss of control'). This single factor, they argued, could, alternatively, be labelled 'severe dependence'.

A provisional attempt to measure impaired control in gamblers was made using the Scale of Gambling Choices (Baron, Dickerson & Blaszczynski 1995). This scale was developed in part from the pioneering work on the Impaired Control Scale (ICS) (Heather *et al.* 1993), but was also based on observational studies of off-course gamblers (Dickerson *et al.* 1990) and a study of gamblers' self-perceptions of impaired control (Corless & Dickerson 1989). A set of 18 items covered 'the desire to limit or stop gambling (and the reported difficulty in attaining these objectives) and spending more than intended (in terms of time and money)' (Baron *et al.* 1995, p. 155). This scale was trialled in large-scale community-based surveys and on a clinical sample (Baron *et al.* 1995). The results were encouraging in terms of high internal reliability and concurrent validity (South Oaks Gambling Screen), but the resulting three-factor structure was complex and difficult to interpret with a suspicion that the factors reflected, in part, item-phrasing used to distinguish intention from outcomes.

Consequently, only those 12 items that loaded strongly on one of two main factors in the Baron *et al.* (1995) data were selected for a shortened version of the scale of gambling choices that was then piloted on 82 male Totalizator Agency Board (TAB) gamblers (O'Connor, Dickerson & Phillips 1995). The 12 items covered cues for commencing a session and control issues concerned with terminating a session, and behavioural intentions to resist gambling. It was found that impaired control could be measured reliably and validly in male TAB gamblers utilizing this 12-item scale, with just a one-factor structure emerging. One of the aims of the research reported here was to determine whether this shortened

scale would retain its unitary and coherent structure when replicated with TAB gamblers and generalized to electronic gaming machine (EGM) players of both sexes.

Impaired control over gambling is known to correlate with time spent gambling and expenditure (Dickerson 1991). This research was also designed to test the concurrent validity of The Scale of Gambling Choices by measuring a number of gambling involvement variables, including the 'chasing' of losses (gambling with an intention to recover prior losses), a phenomenon that has been associated with excessive gambling (Lesieur 1984; Dickerson, Hinchy & Fabre 1987; Corless & Dickerson 1989; O'Connor *et al.* 1995).

Therefore, this paper reports on the internal reliability, validity and factor structure of an impaired control scale (a shortened version of The Scale of Gambling Choices) administered to TAB and EGM (male and female) gamblers.

## METHODS

A convenience sample survey methodology was adopted. The next available potential respondent was approached when either entering a gambling venue or when taking a break from their gambling *in situ* (clubs and hotels in Adelaide, South Australia, between 1000 hours and 1600 hours). Interviews were conducted in, or outside, the premises. Occasionally interviews were relocated to a nearby café to obtain sufficient privacy.

The inclusion criteria were that participants gambled at least weekly and were 18 years of age or over. Additionally, only males were interviewed at the TAB ( $n = 84$ ) due to the scarcity of female patrons. Given that approximately an equal number of male and females were at EGM venues, no selective recruiting was required to obtain sufficient numbers of either sex ( $n = 73$  females,  $n = 64$  males). Respondents were offered movie tickets as an incentive to participate. The refusal rate was two-thirds of all those approached.

Interviewers were recruited through university networks and had at least a first degree in the social sciences. While remaining blind to the overall aims of the research, they were given in-depth training in administering the interviews by the first author (including mock interviews) and ongoing supervision.

Ethical clearance was obtained through the relevant university committee to ensure the usual requirements of anonymity, confidentiality, security of data and access to counselling (when requested) were met.

## Measurements

A verbally administered structured questionnaire was developed and piloted in an earlier study (O'Connor *et al.*

1995). It contained questions pertaining to demographics and extent of gambling involvement, including the chasing of losses. The questionnaire also contained the shortened 12-item version of The Scale of Gambling Choices (as outlined in the Introduction).

The impaired control scale items (see Table 1) were measured on a five-point frequency scale relating to the previous 6 months (all questions scored 0–4). Additionally, each item included a 'does not apply' option to allow those respondents, for whom that aspect of control had not been an issue, to answer all items (following Heather *et al.* 1993). The total score possible on the impaired control scale was 48.

Two parallel forms of the questionnaire were developed to reflect slight differences in terminology between TAB and EGM gambling. Additionally, two versions of each questionnaire were used to control for order effects in responding. The questionnaire took between 20 and 40 minutes to complete.

## RESULTS

It must be noted, before reporting the findings, that most of the data pertaining to gambling involvement required logarithmic transformation for it to approach or achieve normal distributions. Extreme values can have undue influence on relationships between variables, and yet in the context of gambling extreme values are often valid responses that should not be excluded. For example, the expenditure of some respondents was in the order of several thousands of dollars per week (compared to an average of less than \$100), and some respondents spent most of their time gambling. Many such cases are accurate representations of the gambler's involvement. Consequently,

it would be a sacrifice of valuable information to exclude a not inconsiderable number of cases from analysis. Transformation (lognatural) retains relative distances between data, but minimizes the impact of outliers (Tabachnick & Fidell 2001). The means of data relating to gambling involvement reported in this paper are geometric unless otherwise indicated. The geometric means produced by transformation are an accurate reflection of central tendency.

### Sample characteristics

All age-brackets were well represented with little departure from the age distribution of Australian adults [Australian Bureau of Statistics (ABS) 1997]. However, a slight over-representation of middle-aged women and younger men, and the under-representation of those over 60 years, is consistent with clinical populations of problem gamblers (Victorian Department of Human Services 2000a). The TAB gamblers were in their early forties and the EGM players in their mid-forties on average, an insignificant difference (Table 2)

There were no differences between the EGM and TAB samples on employment status, income, marital status, education levels or their (and their parents') country of origin (Table 2), and for the most part the two samples closely reflected Australian demographic patterns (ABS 1997). However, female EGM players earned less than their male counterparts (Aus\$20 851 SD = 9738 versus \$34 333 SD = 18 134,  $F[135] = 22.48$ ,  $P = 0.001$ ) and those of Chinese and South East Asian birth were under-represented at 0.7% of the combined samples (14% nationally, ABS 1997).

TAB and EGM gamblers did not differ on average weekly gambling expenditure, the proportion of income

	TAB n = 84 %	EGM n = 137 %	$\chi^2$
Difficult to limit amount	32.1	33.6	0.05
Difficult to resist near venue	39.3	35.0	0.40
(not) Able to gamble less	29.8	23.4	1.12
(not) Able to stop easily after a few bets	40.5	35.0	0.66
(not) Able to stop before all cash spent	26.2	13.9	5.23*
(not) Able to resist the urge to start	36.9	31.4	0.71
Once started an irresistible urge to continue	56.0	43.8	3.08
(not) Able to stop for a week or more	25.0	21.2	0.44
(not) Able to stop before the last race or venue closes	16.7	5.8	6.81**
Difficult to resist even for a day	31.0	26.3	0.56
(not) Able to gamble less often	28.6	15.3	5.63*
(not) Able to stop before getting into debt	15.5	6.6	4.61*

**Table 1** Impaired control items endorsed ('sometimes–very often').

\* $P < 0.05$ ; \*\* $P < 0.01$ .

	TAB n = 84		EGM n = 137		F
	M	(SD)	M	(SD)	
Weekly expenditure <sup>a</sup> (\$)	288	(723)	133	(205)	2.29
[geometric mean]	[83]		[64]		
Time/week <sup>a</sup> (minutes)	506	(573)	283	(291)	13.65***
[geometric mean]	[307]		[178]		
Profit/losses last 6 months (\$)	-140	(581)	-405	(1289)	8.12**
Total score for impaired control	12.0	(10.4)	9.9	(9.2)	2.36
Years of regular gambling	19.9	(15.6)	4.1	(3.5)	132.06***
Age at commencement	21.5	(6.9)	41.2	(15.6)	131.96***
Age	41.2	(14.8)	46.0	(15.5)	5.09*
Income	29 134	(18 621)	27 065	(15 699)	0.73
	%		%		$\chi^2$
Australian-born	72.6		78.1		0.86
Completed high-school	63.1		58.4		0.48
Employed (incl. part-time)	64.3		74.5		3.00
Cohabiting	40.5		51.8		2.69
Gambling-related debt	47.0		47.7		0.01
Chase losses (within a session)	58.3		58.4		0.00
Chase losses (return later)	36.1		30.7		0.71

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

<sup>a</sup>Data for these variables had a number of extreme cases. Hence lognatural transformations were applied to the data and the geometric means are provided. The transformed data were used in statistical analysis of significance.

**Table 2** Gambling involvement and demographics.

spent gambling or gambling-related debt (Table 2). The TAB respondents spent more time gambling each week than did the EGM players, but recent losses were only a third of that reported by the EGM players. The TAB respondents had gambled regularly on average for two decades (beginning in their early twenties), in marked contrast to just 4 years for EGM players (beginning in their early forties), reflecting the introduction of EGMs to community venues in Adelaide just 4 years prior to this study. Being younger at the commencement of regular gambling correlated with impaired control scores in the EGM players, but not in the TAB gamblers.

### Impaired control profiles and structure

The total scores for impaired control did not differ significantly between the EGM and TAB samples ( $M = 10.02$  [ $SD = 9.21$ ] versus  $12.12$  [ $SD = 10.42$ ], respectively), with similar distribution of scores. At the 25th percentile the scores were 2 and 3 for the EGM and TAB respondents, respectively, 7 and 9 at the 50th percentile, and 16 and 19.5 at the 75th percentile (EGM skewness 0.97 and kurtosis 0.28; TAB 0.89 and 0.42, respectively). The slight tendency for the TAB gamblers to score higher than EGM players was reflected on four of the 12 impaired control items (Table 1). For both samples, the items endorsed most frequently were 'once started an irresistible urge to

**Table 3** Factor structure of the impaired control scale (shortened version of the Scale of Gambling Choices).

Items	TAB	EGM	EGM
		Factor 1	Factor 2
Difficult to limit amount	0.79	0.89	-0.06
Difficult to resist near a venue	0.83	0.71	0.08
Able to gamble less	0.81	0.79	0.04
Stop easily after a few bets	0.88	0.73	0.14
Stop before all cash spent	0.71	0.50	0.28
Resist the urge to start	0.76	0.88	-0.01
Once started an irresistible urge to continue	0.74	0.86	-0.08
Able to stop for a week or more	0.74	0.53	0.32
Able to stop before the venue closed	0.76	0.06	0.85
Difficult to resist even for a day	0.69	0.73	-0.12
Able to gamble less often	0.77	0.49	0.48
Able to stop before getting into debt	0.74	-0.03	0.87

Extraction method: principal component analysis.

continue' and not being 'able to stop easily after a few bets'.

The impaired control scale formed just one factor for the tab data, with high reliability (alpha 0.94) and with 59.4% of variance explained (Table 3). The impaired control scale formed two factors in the EGM sample explaining 65.35% of variance, alpha 0.92 (Table 3). The first

**Table 4** Gambling involvement variables correlated with impaired control scores.

	Impaired TAB r	Control EGM r
Expenditure/week	0.25*	0.57***
Expenditure as proportion of income	−0.45***	−0.48***
Time/week	0.42***	0.46***
Days/week	0.49***	0.28**
Gambling-related debt	0.39***	0.48***
Chasing losses	0.64***	0.65***

\* $P < 0.01$ ; \*\* $P < 0.001$ ; \*\*\* $P < 0.001$ .

factor represented generalized impaired control across all items, bar the two items of not being 'able to stop before the venue closed' and not 'able to stop before getting into debt'. These two items loaded heavily on the second factor. Various rotations were used to help interpret the second factor (the interested reader can refer to O'Connor 2000), but it will suffice to report here that the second factor appears to be an artefact associated with a very constricted distribution on the two items associated with debt and staying until the venue closes (just 6.6 and 5.8% of EGM respondents, respectively, compared to 15.5 and 16.7% of the TAB gamblers). Either of these items could be removed allowing the other to remain (suggesting they are highly interrelated) in a single factor structure for impaired control.

For both samples, all the impaired control items loaded strongly and the reliability of the scale was not improved by removing any of the items. The scale had adequacy of item selection (KMO) and correlation of variables (Bartlett's test). Inspection of the anti-image correlation matrix revealed that all the measures of sampling adequacy were well above the acceptable level of 0.5 (there were none below 0.87).

### Gambling involvement and impaired control

For both the TAB and EGM samples, measures of gambling involvement (e.g. total expenditure, expenditure as a proportion of income, days and time spent gambling each week, recent losses, gambling-related debt) were significantly related to impaired control scores, ranging from modest to strong associations (Table 4).

Chasing of losses (a composite measure of chasing within a session, returning later to chase, intentions to chase and feeling an urge to chase) strongly correlated with impaired control scores in both the TAB and EGM samples (Table 4). All the various aspects of chasing correlated highly with impaired control (see O'Connor 2000 for an in-depth analysis of chasing behaviour, including

the finding that chasing losses was the foremost predictor of high impaired control scores in regression analysis).

All the relationships between gambling involvement and impaired control remained significant with age controlled for. The two correlations below 0.03 that attained statistical significance (Table 4) should be considered of little practical or theoretical significance (particularly given that Bonferroni correction for multiple variables set at an alpha of 0.01 produced an overall alpha of 0.06).

### Gender

There were few gender differences in both demographics and gambling involvement variables. Indeed, the only demographic difference was that females earned less than their male counterparts as mentioned earlier. This reflects, at least in part, the fact that of those females employed, 50% were in part-time employment compared to 14.9% of males ( $\chi^2[1] = 12.9$ ,  $P < 0.001$ ).

Female EGM players gambled slightly longer than did their male counterparts (312 minutes per week [SD = 284] versus 249 minutes [SD = 298],  $F[1, 135] = 8.29$ ,  $P < 0.01$ ), again possibly reflecting, in part, higher levels of part-time employment among females allowing greater opportunities to gamble. Their total gambling expenditure was not different to males, nor the proportion of income spent on gambling.

There were no sex differences among EGM players in total impaired control scores. Males and females did not differ on any of the 12 impaired control items, and their factor profiles for impaired control were very similar.

However, female players indicated that short sessions of an average duration of 31 minutes [SD = 24.7] (truncated due to a rapid loss of stake money) resulted in feelings of frustration that were associated with higher impaired control scores ( $r = 0.42$ ,  $P < 0.001$ ). Male players also found a half-hour of play a frustratingly short session ( $M = 29$  minutes,  $SD = 25.5$ ), but this experience was not related to impaired control.

### DISCUSSION

Demographically, the respondents were a sufficiently representative cross-section of the Australian population to indicate that impaired control over gambling does not exist only in unique or idiosyncratic populations. Demographics were, on the whole, not associated with impaired control. The exception was that being older (from about 50 years of age and particularly over the age of 60) was protective of impaired control. Lower income is a probable mediating factor here, but as suggested by earlier focus-group research (O'Connor *et al.* 1995; O'Connor & Dickerson 1997), the age effect may be due



in part to long-experience with gambling eventually inhibiting over-involvement through more realistic appraisal of the probabilities of winning. This line of argument is associated with the maturational hypothesis that has been advanced in relation to the self-limiting nature of alcohol problems (e.g. Vaillant 1983). Arousal mechanisms involved in excessive gambling may also diminish with age (just as sensation-seeking tendencies reduce with age—Zuckerman, Eysenck & Eysenck 1978).

### The nature and structure of impaired control

There was confirmation of previous alcohol (Heather *et al.* 1993) and gambling research (Corless & Dickerson 1989; Baron *et al.* 1995; O'Connor *et al.* 1995) that impaired control appears to be a valid concept with face, construct and concurrent validity. The generic nature of impaired control is demonstrated by the lack of difference in total scores for the TAB and EGM samples (including an absence of gender difference on the EGMs). The dimensional/continuum nature of impaired control was also confirmed (Heather *et al.* 1993); in all samples scores were well distributed, albeit skewed. A problematic level of impaired control appears to be a common feature in samples of regular gamblers recruited in, or outside, venues.

The prominence of the impaired control item 'an irresistible urge to continue once started' (the most commonly experienced item in both samples) is interesting in that it is, of all the items, the one which accords most closely with Jellinek's (1960) description of 'loss of control' over alcohol consumption. An irresistible urge to continue may be the core aspect of impaired control for all people struggling (to whatever extent) to control any behaviour, gambling included. If this is the case, then contingencies that operate within gambling environments to promote persistence in play will be likely to impact on many regular gamblers at one time or another.

Items associated with starting a session ('not able to resist the urge to start', 'difficult to resist near a venue') were also commonly endorsed by both TAB and EGM gamblers. This phenomenon is related to Jellinek's (1960) concept of 'inability to abstain', which he found predominated in countries in which it was the custom to drink on several occasions every day. However, 'loss of control' and 'inability to abstain', as mentioned earlier, were found to be constructs that related strongly to each other (i.e. they were not independent phenomena) in a large sample of problem drinkers (Kahler *et al.* 1995). Rather than the two constructs defining subtypes, the authors concluded that 'loss of control' and 'inability to abstain' formed part of a 'unitary dimension of impaired control' (p. 1025). This is consistent with the unitary, one-factor, structure of impaired control found with gam-

blers in the research reported here (except note the removal of the debt item for the EGM respondents).

The impaired control items endorsed by a small number in both samples, and which most highly differentiated low and high impaired control scorers, were those of not being 'able to stop before getting into debt' and not being 'able to stop before the last race or before the venue closes'. These items are not distributed throughout the continuum of impaired control, suggesting they would be more sensitive screening items.

### Gambling involvement and impaired control

A robust finding in the literature, confirmed further here, is that more time spent gambling, higher levels of gambling expenditure and debt, and chasing of losses are associated with impaired control (Lesieur 1984; Corless & Dickerson 1989; Dickerson 1991; O'Connor *et al.* 1995; Orford, Morison & Somers 1996).

The current research also indicates that for some TAB gamblers, and many EGM players, impaired control occurs relatively early within their gambling careers (within 4 years for EGM respondents in this study). This confirms other research that has found a rapid transition from non-problematic to problematic gambling among EGM players (Alberta Alcohol and Drug Abuse Commission 1997; Schellinck & Schrans 1998; Productivity Commission 1999).

### Gender

Gender differences on the EGMs were largely a matter of detail rather than major thematic departures. The few differences in levels of gambling involvement did not translate into any marked differences in impaired control. One exception to this general conclusion was that frustration experienced by females at a truncated session of play was related to greater impaired control. Frustration at a quick loss may indicate that length of play is a more important motive for female than for male EGM players. This interpretation is consistent with recent research that found EGMs fulfilled a need for 'time-out' from social roles in female players (Victorian Department of Human Services 2000b). Prioritizing lengthy duration of play over winning *per se* has also been reported in a small group of heavily involved adolescent fruit-machine players (Griffiths 1995), suggesting that there may be various subgroups of EGM players for whom 'playing with money rather than for it' (p. 79) is a primary motive.

However, to emphasize the few gender differences to emerge would be to risk over-interpretation of the data and dilute the overall finding in relation to impaired control on the EGMs: i.e. males and females were remarkably similar. This is consistent with research that addressed

gender differences specifically in Australian EGM players; no differences were found in gambling involvement (Ohtsuka *et al.* 1997). This may indicate that the highly structured nature of EGM play mitigates against gender differences having a significant impact. Alternatively, and supported by the few substantial differences to emerge in this research between the two very different forms of gambling of race-horse betting and EGM play, it may be testimony to the highly generic nature of excessive gambling when characterized by impaired control.

### Limitations of this research

In interpreting the results of these studies, the issue of representativeness of the sample is an important one. As the recruitment of gamblers occurred during the day, it is possible that they constitute a somewhat different population from those who gamble only in the evenings. Additionally, the TAB sample was again limited to males only (female TAB players do exist, but in very small numbers relative to men), and only a third of those approached agreed to be interviewed. This low response rate is not atypical of research with gamblers recruited *in situ* (Schellinck & Schrans 2001). Gambling is currently a very contentious issue in Australia given rapid increases in expenditure and losses in recent years (Productivity Commission 1999), and some of those approached may have felt sensitive to any inquiry of their gambling. Caution must therefore be exercised in generalizing these findings to all regular gamblers.

It must be acknowledged that this research is limited by the nature of retrospective self-report. There is the danger of error in recall, reconstructed memory and response sets (Davies 1992). However, we should not be unduly sceptical of self-report. In a series of alcohol-related studies, it has been found consistently that the self-report of problem drinkers is encouragingly accurate when compared with collateral report from their partners (Maisto, Sobell & Sobell 1979, 1982; Maisto *et al.* 1982), provided that the interview is non-judgemental and that the respondents do not feel coerced to change their behaviour (Cunningham & Sobell 1997). There is no reason to believe that excessive gamblers should be any less accurate when self-reporting and recall in the current research was anchored to recent gambling, but it is recognized that there is an absence of research in this area.

It is also possible that attributions after the event are being reported by the respondents under the potentially leading conditions of the interview and structure of the questionnaire, rather than truly accurate explanations (Davies 1992). This is a difficult criticism to counter, and to a large extent is a hypothesis beyond testing. In defence of the current research, the process of inquiry went

through an exhaustive process of focus groups and interviews, and careful piloting of the questionnaires. If what we have here is largely a set of attributions, then at the least they are the gamblers' attributions which can be expected to impact on their future expectancies and behaviour (Kelley & Michela 1980).

Some confidence can be placed in the validity of the current results as the research was rooted in the existing literature, and concurrent validity was achieved through a reasonably comprehensive collection of data.

### CONCLUSION

Impaired control is a difficult concept to operationalize, but the current research has confirmed it is an important and valid concept that can be reliably measured. That there is much overlap in the nature of impaired control across excessive behaviours is indicated by the fruitful application of a modified scale (The Scale of Gambling Choices) that was based closely on an earlier effort to operationalize impaired control over alcohol (Heather *et al.* 1993). The findings here also lend weight to the conclusion of Orford *et al.* (1996) that the process of 'over-attachment', of which impaired control is a core aspect, is a general phenomenon across excessive behaviours such as drinking and gambling.

However, further research is required to clarify the nature of impaired control over gambling. There is much to learn about the interface between personality characteristics, social disadvantage, environmental contingencies, life stressors and impaired control over gambling.

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