Inconsistency between concept and measurement: The Canadian Problem Gambling Index (CPGI)

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Abstract

"Problem" and "pathological" gambling represent core concepts that guide gambling research today. However, divergent interpretation of the relation between these terms is continually misguiding the measurement and interpretation of empirical data, and may cumulatively lead to larger-scale problems of conclusion and policy formulation over the next decade. This paper first attempts to unravel the conceptual muddle by outlining the trajectory of the usage of the two terms, from a period where both were dimensionally similar concepts firmly situated in the addiction model to a more recent conception, which takes the view that problem gambling is distinct and properly measured by focusing on the problems that excessive gambling may cause to individuals, families, and communities. We then aim to analyse and criticize the Canadian Problem Gambling Index (CPGI) as a clear example of the confusion of paradigms, an index that defines problem gambling in the newer, problem-centred model, but continues to measure it with items reflecting the older, addiction-centred model. We argue that results obtained using the CPGI, much like those of its predecessors, will not adequately capture the notion of harm that underpins current definitions of problem gambling.

Keywords: problem gambling, pathological gambling, measurement, definition, CPGI

Introduction

Research in problem gambling is notorious for being plagued with a multitude of terms that seek to capture the construct, including "compulsive," "pathological," and "problem" gambling. These terms are ill-defined, often being used interchangeably and without an understanding of their theoretical origins and associated paradigms. Over the years, pragmatic concerns have relegated conceptual distinction to the wayside, with the view that making advances in treatment efficacy is more important than what is seen as a largely academic debate over terms and concepts. However, we wish to draw attention to an important conceptual distinction concerning the definition of problem gambling and to show how, in certain jurisdictions, failure to understand this conceptual distinction has led to muddled thinking, resulting in a bifurcation between concept and practice in the measurement of problem gambling, a bifurcation that may have significant consequences for future research and policy decisions.

The addiction-based concept of problem gambling

In the literature on problem gambling, there are two quite different conceptions of what problem gambling is. The earlier conception has its origins in the development of the related concept of pathological gambling. Pathological gambling was added to the list of psychiatric disorders in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III*; American Psychiatric Association, 1980). In the revision of this manual published in 1987 (*DSM-III-R*), the criteria for pathological gambling were based on those for substance dependence, and an underlying explanatory model of addiction was assumed (Walker, 1992). At the same time, the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987) was developed as a clinical screen for diagnosing individuals as probable pathological gamblers. Importantly, the SOGS included items concerned with preoccupation, tolerance, withdrawal, and loss of control that overlapped with the *DSM-III-R* and are the core constructs of an addiction model. Thus, the construct of pathological gambling is not theoretically neutral either in its definition or in its measurement. Rather, this construct assumes that gambling can become an addiction that can be clinically diagnosed by signs that are similar to other addictions. Indeed, excessive gambling has been referred to as a "pure addiction" because the addiction exists without the associated chemical component of drug addiction (Custer & Milt, 1985; Jacobs, 1986).

In the SOGS, probable pathological gambling is diagnosed by a score of five or more positive answers to the 20 items on the list. Problem gambling is defined as a score of three or four positive answers to the same list of 20 items. Thus, the concept of problem gambling inherent in the SOGS is as a weaker form of pathological gambling. Pathological gambling and problem gambling share a common theoretical basis as terms related to addiction to gambling. There is now an extensive literature of research and argument that assumes that problem gambling and pathological gambling are closely related and only differ in severity. This conception of problem gambling as a weaker form of pathological gambling is explicitly stated in research on the prevalence of pathological and problem gambling (Petry & Tawfik, 2001). Problem and pathological gambling lie on the same dimension and differ only in the severity of the addiction. We label this older view "addiction-based" to discriminate it from the more recent "problem-centred" view.

The problem-centred concept of problem gambling

The alternative problem-centred view of problem gambling is becoming increasingly popular. This more recent conceptualization is based in the distinction between excessive gambling behaviour and problems that are a consequence of that behaviour (Walker, 1992). By defining problem gambling as gambling problems that result from excessive gambling behaviour, this alternative conceptualization of problem gambling remains theoretically neutral. In particular, there is no implication that problem gambling involves an addiction to gambling. The focus of this alternative view of problem gambling is the degree of harm caused to the individual, not the mechanisms by which the gambling behaviour becomes excessive. It is a viewpoint that has found widespread international acceptance. In the United States (Cox, Lesieur, Rosenthal & Volberg, 1997; Lesieur, 1998), Canada (Ferris & Wynne, 2001), and Britain (Sproston, Erens, & Orford, 2000), problem gambling has been defined to encompass all gambling behaviour types and patterns that cause disruption and damage to a person's functioning. Similarly in Australia, Dickerson, McMillen, Hallebone, Volberg, and Woolley (1997) defined problem gambling as "the situation when a person's gambling activity gives rise to harm to the individual player, and/or to his family, and may extend into the community" (p. 106).

By highlighting the harms caused by excessive gambling behaviour, this alternative definition of problem gambling fits well within a public health model. The public health approach is a broad framework providing the perspective that problem gambling "is not restricted to a narrow focus on gambling addiction" (Shaffer, 2003, p. 15); that is, it is not just a problem of addiction and individual psychopathology, but rather a problem that exists in a social setting, is multiply determined, and has broad community effects (Korn, Gibbins, & Azmier, 2003; Shaffer, 2003). Rather than focusing on the addiction-like attributes of excessive gambling, the public health model focuses on harm caused by gambling, and by this virtue is designed to allow a better determination of the socio-economic impacts of gambling. This model also has several policy functions. Gamblers experiencing harm may not necessarily be those experiencing severe personal or psychological problems. By limiting the count of problem gamblers to those with specific psychological or psychiatric symptom profiles, policy efforts may fail to reach the larger numbers of individuals who are harmed by excessive gambling. Furthermore, as Shaffer and Korn (2002) point out, although members of this larger group may not be suffering from severe psychological impairment or psychopathology at the individual level, they collectively have the greatest impact on the community. For this reason, greater individual and community benefit may accumulate from intervention, treatment, and education measures directed at this larger group that is defined by the range and intensity of the harms caused by gambling.

Despite the explicit definitions of problem gambling that underpin the emerging public health approach in Australia, Britain, Canada, and the United States, discussions of the public health model and its implications have sometimes lapsed into a confusion of the addiction-based concept and problem-centred conceptions that lie at the centre of the debate. These discussions have thereby, unintentionally, led to muddled conclusions. Shaffer (2003) for example, points out how a public health approach to problem gambling is akin to other addictions and communicable diseases. He advocates an

> epidemiological examination of gambling and gambling-related disorders … to understand the distribution (i.e. pattern and spread) and determinants (i.e. origins) of gambling as well as the factors that influence a transition from healthy to unhealthy gambling… [O]nce scientists identify the base rate of an illness with some degree of precision, then they should direct attention to vulnerable groups with very high rates of the disorder. (p. 2)

In this view, gambling prevalence research is similar to psychiatric epidemiology that directs treatment, harm reduction, and prevention efforts. This view also makes the assumption that problem gambling is a psychiatric disorder, that there exists a point at which gambling becomes "unhealthy," and that problem gambling is a diagnosable "illness." It is beyond the scope of this paper to review the empirical evidence that problem gambling is an illness or psychopathology (see Walker, 1992; Walker & Dickerson, 1996), or to restate any view that the illness model serves a socio-political rather than a scientific function (see Rosecrance, 1985). Suffice to say, the assumption is contentious and places the public health model into a theory-laden framework. The greater risk is that this assumption may further legitimize the use of clinical screening tools in prevalence studies, while at the same time ignoring the true implications of theory-neutral and widely accepted public-health definitions of problem gambling.

Implications of the problem-centred concept for measurement

The problem-centred view of problem gambling assumes that excessive gambling behaviour causes a range of problems for the individual, for his or her family, and for the community. What constitutes excessive gambling depends on the characteristics of the individual and the extent to which his or her circumstances will tolerate a greater or lesser expenditure of money and time on the activity. It is not simply the volume of gambling or the size of the loss that defines problem gambling. There may be heavy time and monetary expenditure on gambling activities, but if there are no consequences of that behaviour, as may often be the case for gamblers with ample leisure time and large disposable incomes, then this cannot constitute problem gambling in the public health sense. It follows that it is not the characteristics of the gambling itself that define problem gambling but rather the fact that an individual may not limit the expenditure of money and time to stay within reasonable bounds of the resources available. The characteristics of the gambling may include the attributes of addiction, but this aspect alone is not a necessary or sufficient condition for the presence of problem gambling. A person may exhibit a preoccupation with gambling, tolerance effects for session length, and

withdrawal symptoms when gambling ceases. However, if the gambling involves sufficiently small bets, no problems may follow. Chasing losses is frequently associated with problem gambling, but it is not the act of chasing that marks the onset of problem gambling, but the fact that chasing may cause the individual to cross the critical threshold of tolerable monetary loss. It is for this reason that we have seen an emergence of harm-based conceptualization of problem gambling in the past decade (Dickerson et al., 1997; Neal, Delfabbro, & O'Neil, 2005). For example, Neal et al. (2005) state, "Problem gambling is characterized by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community" (p. 125). According to these widely accepted definitions, if the expenditure of money and time do not cause problems for the individual, others, or the community, then the gambling does not meet the necessary condition for the occurrence of problem gambling. It follows that problem gambling must be measured by the number and extent of the problems caused by the gambling, not by whether or not the gambling behaviour has the characteristics of addiction or any other individual psychopathology.

The re-conceptualization of problem gambling in terms of the harm caused by excessive gambling implies a re-evaluation of the methods by which problem gambling is screened and measured. The SOGS (Lesieur & Blume, 1987) has been used in almost all problem gambling prevalence research across the United States, Asia, Europe, and Canada (Shaffer, Hall & Vander Bilt, 1999; Sproston et al., 2000; Volberg, Abbott, Ronnberg, & Munck, 2001). Although recent prevalence studies in the United States (Gerstein et al., 1999) have also used a screen based on *DSM-IV* (1994), such as the NODS, the SOGS remains as one of the most widely used prevalence measures in the world (Abbot & Volberg, 2006). Over the period of its use, the SOGS has received an accumulation of criticism directed at the context and assumptions behind its development (Volberg, 2001), its outdated criteria (Volberg, 1996), and the validity of its estimates (Walker & Dickerson, 1996).

The Canadian Problem Gambling Index (CPGI)

One recently developed scale, the Canadian Problem Gambling Index (CPGI), has received attention as a potential successor to previous instruments. Developed largely as a response to the criticism around the SOGS, the CPGI has been presented as a modern and promising tool for use in problem gambling prevalence research. The scale as a whole contains 31 items (plus demographics) that cover gambling involvement, problem gambling assessment, and correlates of problem gambling (Ferris & Wynne, 2001). Only nine of those items are scored, and they comprise the Problem Gambling Severity Index (PGSI), an index designed to serve both as a prevalence measure and a general population screen that is brief, reliable, and provides adequate estimates of the problem.

In the first stage of the development of the CPGI, the Canadian Inter-Provincial Task Force on Problem Gambling adopted the following definition of problem gambling: "Problem gambling is gambling behaviour that creates negative consequences for the gambler, others in his or her social network, or for the community" (Ferris & Wynne, 2001, Introduction at 1.2). This definition takes as its focus the consequences or harm of gambling activity, and is very similar to that proposed earlier by Dickerson et al. (1997) and Neal et al. (2005). Although it is a problem-centred definition suitable for use within the public health model, the developers of the CPGI state that that they still sought to develop the PGSI as a measure of both problem behaviour and adverse consequences (Ferris & Wynne, 2001).

In addition to adopting a harm-based operational definition, the PGSI also involved the creation of a range of categories into which respondents may fall: non-gamblers, non-problem gamblers, low-risk gamblers, moderate-risk gamblers, and problem gamblers. The ordinal sub-types of the PGSI suggest a problem gambling continuum, and so are seen as a substantial improvement to the dichotomous and discrete variables encompassed in instruments such as the *DSM-IV* (1994) and the SOGS. In brief, in the CPGI's rationale and associated features, the developers of the CPGI claim that it is "a new, more meaningful measure of problem gambling for use in general adult population surveys, one that reflect[s] a more holistic view of gambling, and include[s] more indicators of social context" (Ferris & Wynne, 2001, p. 1.1).

The CPGI has become the measure of choice throughout Canada and has also been used in Norway and Iceland (McCready & Adlaf, 2006), New Mexico (Volberg & Bernhard, 2006), and recently in the United Kingdom (Wardle et al., 2007), as well as in Australian prevalence studies in Queensland (Queensland Treasury, 2001, 2005), Victoria (McMillen, Marshall, Ahmed, & Wenzel, 2004), and Tasmania (Roy Morgan Research, 2006). Furthermore, McMillen et al. (2004) compared the SOGS, the Victorian Gambling Screen, and the CPGI and viewed the CPGI more favourably than the other two screens in terms of its overall rationale, psychometric properties, and brevity that promises efficiency of administration. However, as this paper aims to show, despite the explicit definition of problem gambling in terms of the public health model, the actual prevalence index in the CPGI is associated with an addiction-based model and as such, it cannot provide a measure of problem gambling as conceptualised in the problem-centred, public health model. It follows that research aimed at measuring problem gambling defined in terms of harm may be seriously misguided in using the CPGI prevalence index.

An analysis of the CPGI

The development of the CPGI was associated with an explicit rejection of a medicalized model of pathological gambling in favour of a view of problem gambling as a social issue with public health consequences (Ferris & Wynne, 2001). However, in the light of such a framework and the explicit model adopted, it is important to analyse the actual items chosen for the PGSI.

Table 1
The Problem Gambling Severity Index (PGSI) of the Canadian Problem Gambling Index (CPGI): items and their origins

	CPGI item	SOGS or *DSM-IV* derived
	In the last 12 months, how often…	
1.	Have you bet more than you could really afford to lose?	SOGS
2.	Have you needed to gamble with larger amounts of money to get the same feeling of excitement?	*DSM-IV*
3.	Have you gone back another day to try and win back the money you lost?	*DSM-IV*
4.	Have you borrowed money or sold anything to get money to gamble?	SOGS
5.	Have you felt that you might have a problem with gambling?	SOGS
6.	Have you felt that gambling has caused you health problems, including stress and anxiety?	--
7.	Have people criticized your betting or told you that you have a gambling problem, whether or not you thought it was true?	SOGS
8.	Have you felt that your gambling has caused financial problems for you or your household?	--
9.	Have you felt guilty about the way you gamble or what happens when you gamble?	SOGS

Note. DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (American Psychiatric Association, 1994); SOGS = South Oaks Gambling Screen. Scoring: 0 = Never, 1 = Sometimes, 2 = Most of the time, 3 = Almost always. Cut-off scores: 1-2 = Low risk, 3-7 = Moderate risk, 8-27 = Problem gambler. From *The Canadian Problem Gambling Index: Final Report,* by J. Ferris and H. Wynne, 2001, Ottawa, ON: Canadian Centre on Substance Abuse.

The first, and most problematic aspect of the PGSI, is that its items were drawn from scales measuring pathological gambling. The PGSI uses items largely borrowed from instruments (SOGS and *DSM-IV*) that have been developed in a U.S. clinical context and for the express purpose of identifying pathological gambling. Using a content analysis of the items in the PGSI and SOGS, McMillen and Wenzel (2006) concluded that the PGSI and the SOGS show considerable overlap in their content, much more so than their foundational differences may suggest. Furthermore, the PGSI includes an item taken from the *DSM-IV* related to tolerance (Item 2), a core construct of the addiction model. The authors claim that the inclusion was justified because "DSM-IV items ... capture the more severe end of the gambling problem spectrum very well" (Ferris & Wynne, 2001, Results section 3.2). By adopting the older concept of problem gambling as a less severe form of pathological gambling, this statement undermines the explicit claims that the CPGI concept of problem gambling derives from the public health model.

The derivative nature of the PGSI attracts with it further problems. Given that the CPGI is largely based on items in the SOGS and *DSM-IV*, a certain amount of scepticism is needed in relation to the favourable psychometric properties of the CPGI, namely, its internal consistency, calculated at 0.84 by Ferris and Wynne (2001) and 0.92 by McMillen and Wenzel (2006); additional properties calculated by Wynne (2003) such as test-retest reliability (0.78), specificity (1.00), and classification accuracy (0.83, as measured against the *DSM-IV*); and its 0.83 correlation with both the *DSM-IV* and the SOGS (Wynne, 2003). Indeed, any strong correlation with the SOGS and the *DSM-IV* should be expected, given that eight of the nine items in the index are based on SOGS and *DSM-IV* items. Govoni, Frisch, and Stinchfield (2001) have also pointed out these significant overlaps, with the implication that caution must be taken in interpreting these estimates. It is inappropriate to correlate the CPGI with the SOGS or to estimate the classification accuracy of the CPGI against the *DSM-IV* in order to establish robust psychometric properties. It should come as little surprise that the CPGI produces superior statistical properties (such as reliability coefficients and estimates of specificity and a single factor loading) over other screens because that is what it was designed to do, and correlation with previous screens is a result of the fact that it is a derivative of previous screens. The CPGI is part of a chain that links all its predecessors: the SOGS was developed from and evaluated against the *DSM-III-R*, the SOGS was the standard for the development of the *DSM-IV*, and now the CPGI has been developed from and evaluated against both the SOGS and *DSM-IV*. The circularity of this process led Shaffer and Korn (2002) to observe that "most screening devices are incestuous, having been derived from each other and then used to test the development of their progeny. The result is psychometric tautology" (p. 182). These authors also agree that there is currently no gold standard by which prevalence measures can be evaluated and link it to a more general problem in lack of a valid and independent standard by which we can evaluate the utility and precision of prevalence measures (Shaffer & Korn, 2002). In sum, the statistical development and statistical validation of the CPGI is a victim of the same circular reasoning that lies behind its predecessors.

Validation of the CPGI

The validation of any prevalence measure necessitates a different process. As Thomas, Jackson, and Blaszczynski (2003) note:

> We are strongly of the view that measures of problem gambling and the evaluation of their utility need to be directly aligned to their stated purposes and that they also need to derive from a conceptual or theoretical account of problem gambling and its components. (p. 20)

Thus, either an index is designed to reflect a theory about problem gambling and then evaluated using statistical procedures, or, if an index was compiled from previous instruments using statistical procedures, then it should be evaluated on its theoretical coherence.

Little research has attempted to validate the CPGI against the actual problems caused by excessive gambling, and the conclusions that can be drawn, thus far, are not encouraging. In fact, the CPGI has not been adequately validated against any measures appropriate to the public health model. In attempting to measure the construct validity of the CPGI, Wenzel, McMillen, Marshall, and Ahmed (2004) conducted a validation study of three screens (SOGS, Victorian Gambling Screen, and CPGI). Wenzel et al. (2004) compared the CPGI with other *correlates* of problem gambling, such as people's self-rating of the extent of their gambling problem, wanting help, family history, stress, and depression, and concluded the following:

> Because scores for the CPGI show the closest relationships to variables which correlate theoretically to aspects of problem gambling, it seems that we should be most confident that the CPGI, of the three screens, most closely measures what it is supposed to measure – problem gambling. (p.47)

This indirect approach is symptomatic both of the fact that no objective external criteria were available to assess validity and of the study's general failure to directly consider the question of what is problem gambling when evaluating the items. The problem is made even more difficult when the *DSM-IV* and SOGS items are clearly founded in an addiction model of gambling, making it difficult to specify what measures would indeed be appropriate and independent.

A further problem is that, because the PGSI lacks theoretical coherence and face validity, it is not able to avoid the inevitable debate about whether it is making measurement errors, that is, over- or underestimation. Ladouceur, Jacques, Chevalier, Sevigny, and Hamel (2005), for example, have published data that sought to compare the SOGS and the CPGI with classifications based on a clinical interview. A majority (82%) of the SOGS or CPGI-identified problem gamblers did not have this classification confirmed when they were administered the follow-up clinical evaluation. In fact, the misclassification rate for the CPGI was 88%, giving cause to believe that, much like the SOGS, the CPGI may be overestimating prevalence and introducing false positives in prevalence data.

Requirement for an adequate measure of gambling-related harm

There is a second major cluster of problems that surround the CPGI, in that the items in the PGSI that supposedly measure harm are not comprehensive. The promise of the CPGI lies in the harm-based definition adopted in Phase I, as well as in the emerging Canadian view that problem gambling is a public health issue. However, the actual PGSI items that are claimed to measure harm are questionable in this capacity. These consist of Items 6-9 (Ferris & Wynne, 2001, see Table 1).

First, Items 6 and 8 relate to clear indicators of adverse consequences. However, these two items cover only a small proportion of the domains where harm can occur, such as relationships, employment, and a person's legal situation. Excessive gambling behaviour may cause a range of social problems, including fractured family relationships, work-related problems, legal problems, and a generalized reduction in the quality of life. Excessive time involvement may provide a separate pathway to harm caused by gambling, an effect that may be particularly prominent among electronic gaming machine players. Second, Item 6 asks about health problems. It is unclear what interpretation the respondent may give to this domain. For one respondent, health problems may be limited to physical health problems, whereas for another, the same term may include mental health problems (such as depression) and for another, personal problems (such as heavy smoking). The content analysis of the CPGI, conducted by McMillen and Wenzel (2006), found only one item that referred to personal and social consequences, which they found surprising given the developers' claim that they were aiming to emphasize issues of harm. It is clear that these items either do not address, or address insufficiently, the adverse consequences that are the core part of the public health definition of problem gambling. These items do not adequately capture the harm that may occur to the self, to others, and to the community.

Items 7 and 9 further exacerbate the problems of the scale. First, we share the view of the Productivity Commission (1999) that Item 7 is more indicative of problematic behaviour than of harm (Productivity Commission, 1999, section 6.28) and that it is an item that would be, at best, only indirectly indicative of harm to relationships. Second, although a person's excessive gambling may be causing arguments and other disruptions to family life, "criticism" in undefined terms is too broad to hold a direct link to problem gambling. Henry Lesieur himself (see Thomas et al., 2003, p.39) has criticized the inclusion of these two items from the SOGS as those least helpful in differentiating problem gambling, a criticism shared by Strong, Breen, and Lejuez (2004) who doubt the ability of these SOGS-derived items to appropriately measure problem gambling. The original problem with the SOGS arose from it being validated using a clinical sample. As a result of that research, the SOGS included items (such as those relating to feeling guilt and criticism) that differentiate pathological gamblers from non-gamblers but that, at the same time, may be characteristic of all regular (non-problem) gambling (Allcock, 1995; Battersby, Thomas, Tolchard, & Esterman, 2002; Dickerson, Baron, Hong, & Cottroll, 1996; Stinchfield, 2002). Given the overlap of the CPGI with the SOGS, one can expect that the CPGI may face similar problems.

At the expense of items that may more comprehensively measure harm, the PGSI instead includes items that may be responsive to cultural differences in gambling attitudes rather than problem gambling. The developers of the CPGI believe that SOGS-derived items such as "receiving criticism" provide an appropriate measure of harm in that they "tap into the social context of gambling" (Ferris & Wynne, 2001, p. 1.2). This may be the case, but these items may do so in an inappropriate manner. Given the nature of the gambling activity and the level of moral polarization associated with it, spouses and friends (depending on their moral persuasion) may be apt to criticize any gambling activity, however infrequent or excessive. Item 9 (feeling guilt) appears to suffer from the same predicament, whether as a marker of a person's own moral attitude towards gambling or of guilt as a result of other people's moral censure of gambling. For example, a person may feel guilty every time he or she gambles, even if the person does so infrequently and would not normally be considered a problem gambler.

The consequence is that endorsement of these items is not a precise measure of actual harm, but will vary according to the moral acceptance of gambling within a culture. For example, in the United States, gambling has traditionally not been as readily accepted and available as it is in Australia (Walker & Dickerson, 1996). Although gambling in Australia has had continuing support and acceptance since the 1920s (O'Hara, 1998), in the United States it was seen as a moral vice for much of the 20th century (Rosecrance, 1985). Although the 1980s was a period of proliferation of proposals in the United States to legalize gambling, Australia was already seeing the emergence of easily accessible urban casinos (Eadington, 1998). In any country where there is less moral stigma attached to gambling, we may expect less criticism to occur of gambling behaviour, regardless of how extensive it is, and thus we may also expect relatively fewer people to feel guilt in relation to any gambling behaviour, however frequent. Lower endorsement of these two items may, all other things being equal, indicate a lower prevalence of problem gambling that would not accurately reflect the actual extent and severity of harm experienced by a community. In addition, the moral and cultural acceptance of gambling tends to change with time as the boundaries of what is deviant gambling behaviour become redefined (Cosgrave & Klassen, 2001; Gusfield, 1967). This means that such items could not only lead to biased estimates of prevalence, but could also lead to difficulty in comparing prevalence rates across both different cultures and different generations.

The argument against the use of these two items is thus beyond the criticisms that are normally directed at subjective items. Indeed, the inclusion of subjective items does not necessarily present an impediment to measurement and does not necessarily invalidate prevalence estimates, especially if harm-related measures are sufficiently unambiguous, concrete, and broad in scope. Items, however, that more directly tap into moral attitudes (whether derived from cultural or religious proscription) and that represent a significant proportion of any screening tool will not only result in invalid measures of harm and adverse consequences, but will introduce systematic differences between large groups of people, not just individuals.

Measuring the problem-centred concept of problem gambling

The public health definition of problem gambling (as excessive gambling behaviour that causes harm to the individual at personal and interpersonal levels) implies an approach to measurement that is independent of previous work, where the addiction model of gambling was an inherent part of the definition of problem gambling. Given the reliance of the CPGI on items drawn from addiction-based measures of pathological gambling, and given the criticisms of the actual measurements made by the CPGI, it would seem important to regard this instrument as not measuring problem gambling as defined in the public health context. It is the view of the authors that the continued use of the CPGI in research on the prevalence of problem gambling will cause errors in the interpretation of the severity of problem gambling throughout the world, errors in understanding the relation of problem gambling to its causes and distribution throughout communities, and errors in deciding best policy and practice in the attempts of governments to deal with this major social problem.

What is required is an independent approach to measurement that does not rely on prior research conducted within the addiction framework. The public health definition implies that both gambling behaviour and the harms caused by that behaviour must be measured. Thus, a dual index would seem necessary. Public health policy must focus on the harm caused to individuals by the presence and availability of widespread gambling opportunities. Of all the measurement instruments that must be developed to appropriately monitor problem gambling, the one that appears central is that which measures the cumulative harm to the individual across the major domains of human functioning. A statistically sound measure of harm caused would seem a necessary next step in problem gambling research. Some attempts to develop such an index already exist, including the gambling addiction severity index (Lesieur & Blume, 1990; Petry, 2003), the HARM scale (Productivity Commission, 1999), and the gambling treatment outcome monitoring system (GAMTOMS; Stinchfield, Winters, Botzet, Jerstad, & Breyer, 2007). Each one aims to assess gambling-related problems in all the main domains of functioning, including the financial, legal, occupational, and psychosocial domain, giving a pure, comprehensive, and composite measure of gambling-related harm. Although none are without major criticism, these earlier attempts give some guidance to the kind of reasoning needed to measure harm caused by gambling successfully. The way forward may well begin with the logic behind these instruments.

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