Gambling Research Panel

GRP REPORT NO. 4

Measuring Problem Gambling —

Evaluation of the Victorian Gambling Screen

Prepared for the Gambling Research Panel by
Melbourne Enterprise International

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Acronyms

CALD	Culturally and Linguistically Diverse
CPGI	Canadian Problem Gambling Index
DSM IV	Diagnostic and Statistical Manual of Mental Disorders Version 4
EGM	Electronic Gaming Machine
GA	Gamblers Anonymous
GA-20	Gamblers Anonymous 20 Question Screening Questionnaire
GRP	Gambling Research Panel
SOGS	South Oaks Gambling Screen
VGS	Victorian Gambling Screen
VCGA	Victorian Casino and Gaming Authority

Executive Summary

This document reports the outcomes of a study commissioned by the Gambling Research Panel concerning the Victorian Gambling Screen (VGS). The objectives of the project were to:

- evaluate the report by Flinders Technologies Pty Ltd (Ben-Tovim, Esterman, Tolchard & Battersby, 2001) detailing the VGS with regard to refining the instrument for application in a population validation study;
- evaluate the VGS against other available instruments including the South Oaks Gambling Screen (SOGS), the Canadian Problem Gambling Index (CPGI) and other instruments and research in relevant international and Australian studies and assess whether the VGS overcomes the perceived shortcomings of these instruments;
- assess the extent to which there are unique features related to problem gambling in Australia and the extent to which these are/could be adequately catered for in the VGS or a modified form of the VGS;
- review the VGS study with regard to dimensions such as: validity and reliability of scale items, methodology and scope, the test re-test reliability of the instrument over time and application to the Australian context;
- deliver a research design for a large scale (a) Victorian and (b) national validation survey that would have the dual purpose of validating the VGS and obtaining some useful information on characteristics of problem and potential problem gamblers; and
- include in the research design details of appropriate survey questions, sampling, telephone survey and other techniques data collection techniques, as appropriate, to chosen sub-populations to allow cross-validation of the VGS with other instruments, and the comparison of a Victorian population study with relevant recent research conducted in other states.

In order to fulfil these objectives, a detailed review was undertaken of the VGS and the following problem gambling measurement tools:

— the South Oaks Gambling Screens (Lesieur & Blume, 1987);

— the Canadian Problem Gambling Index (Ferris & Wynne, 2001a);

— the DSM–IV diagnostic criteria (American Psychiatric Association, 1994);

— the GA 20 Questions (Gamblers Anonymous, 1984); and

— Life Area Measures (Smart & Ferris, 1996).

The reviews were conducted using the scale development protocol developed by De Vellis (1991).

It is argued in this report that the VGS and other screening tools reviewed have two common deficiencies:

- a lack of clarity as to their purpose; and
- insufficient exposition of the theoretical and conceptual basis for the tool items.

It is noted that the main purposes for problem gambling measurement tools include:

- a current diagnostic purpose (who currently has, or has had, the problem);
- a current severity rating purpose (how severe is the problem);
- a predictive diagnostic purpose (who is at risk of developing the problem in the future);

- an intervention design purpose (what is needed to treat the problem); and
- a triage or screening purpose to refer the person for further assessment or action (what further assessment or action is required).

It is further noted that, although it is very unusual in other contexts, within the domain of problem gambling, research screening tools have been developed with the attempt of serving most or all of these disparate purposes in the one instrument.

A model of problem gambling is presented within the report as a conceptual basis for understanding and measuring problem gambling. It is recommended that all problem gambling measures should normally include some provision for each of the three components in the model.

A conceptual model of the components of Problem Gambling

Propensity/Attitudes to gambling	Attitudes to gambling Ideation about gambling Beliefs about control of gambling
Gambling behaviour and activities	Frequency of gambling behaviour Spend on gambling activities Gambling patterns, loss chasing
Consequences of gambling activities	Impact on job, family and friends Criminal behaviour Deception

A detailed content analysis of the screening tools examined in this study was undertaken using the above model. The outcomes of the content analysis, summarised below, illustrates the wide divergence across the different measurement tools in the content and weighting of the various model components.

Tool	Attitudes to Gambling items	Gambling Behaviour items	Consequences of Gambling items	Funding Source	Total scored items
SOGS	3 (15%)	2 (10%)	6 (30%)	9 (45%)	20
CPGI	2 (22%)	3 (33%)	4 (44%)	0 (0%)	9
VGS	10 (41.6%)	3 (12.5%)	11 (45.8%)	0 (0%)	24
DSM–IV	2 (20%)	4 (40%)	4 (40%)	0 (0%)	10
GA 20	6 (30%)	3 (15%)	9 (45%)	2 (10%)	20
Life Areas Measures	0 (0%)	0 (0%)	5 (100%)	0 (0%)	5

In terms of content, the SOGS emphasises the consequences of gambling behaviour; the CPGI emphasises all domains; the VGS equally emphasises attitudes to gambling and gambling consequences; DSM–IV emphasises gambling behaviour and consequences, as does the GA 20; and the Life Areas Measures emphasises gambling consequences.

The psychometric properties of each of the scales were found to be satisfactory in the published literature. Analyses of the VGS were also conducted using survey data collected in the original tool development process.

Assessing the VGS

The general conclusion with respect to the VGS is that the Flinders work was conducted to a high standard using proven and well-substantiated test development protocols. However, a more detailed explication of the conceptual and theoretical model informing its content and its specific purpose(s) would have been useful. Further validation of the tool involving a large validation study sample is required in the context of its specific purposes. It has good internal psychometric properties but the validation process requires further work.

With respect to the CPGI, its capacity to identify 'at risk' gamblers in the general population has potentially important implications for early interventions aimed at preventing or dealing with gambling problems.

In the case of SOGS, which was developed as a clinical tool to identify probable pathological gamblers, there is concern that if taken out of its clinical context, it may yield a high false-positive score in population studies. Also, excessive weight is given to items concerned with borrowing money, and the sources for funding gambling. Furthermore, because it uses a lifetime frame of reference — rather than a past month, past six months or past 12 months — it may overestimate current prevalence, as it captures in population surveys those who may have had a problem with their gambling but now no longer do so. SOGS may also be insensitive to the social and material contexts of the player, including culturally diverse contexts. It may be better used as a screen prior to validation of problem gambling status by application of DSM–IV or clinical interview, as appropriate.

Because of the differences in emphasis of the various tools and their different cut-off points and scoring methods, the selection of the most appropriate tool for studies of gambling behaviour within the Victorian community requires data that is not available in any of the studies conducted to date.

In order to select the most suitable gambling measurement tool for subsequent community studies, a validation study involving the CPGI, the VGS and the SOGS is appropriate in line with the GRP 2003 study cross-validating all three screens in a large-scale survey of the Victorian community. The researchers believe the CPGI and the VGS most closely reflect the aims of the Panel's community studies and that the SOGS is a standard international tool that must be included in the validation study for comparability reasons.

The survey design for such a validation study should ensure that:

- sufficient numbers of people at different levels of gambling activity are included as the study must show that the tools can work well across the full range of gambling participation levels and outcomes, not just for problem gamblers; and
- key groups including men, women, people from metropolitan, rural and regional settings and varied cultural backgrounds are included in sufficient number in the study.

This report also includes consideration of the issue of a national study of problem gambling. While noting that the survey methodology for a Victorian and a national study would be similar, and use the same survey tools, it is noted that the design of the sample frame would need to be informed by a consideration of the groups to be compared in the analyses.

Policy implications of the present study

In the final section of the report, consideration is given to the important policy considerations flowing from the development of credible measures of problem gambling.

It is argued that the development of credible measures to inform such research fits squarely within the requirements of government for evidence-based policy and practice. It is argued that in gambling policy the development of credible measures of problem gambling are the linchpin of future research

and policy. The numbers and distribution of problem gamblers within the community have important implications for the design and delivery of services targeted at problem gamblers. Who they are, and where they are located, has a pivotal impact upon service design and funding. Clearly, there is a need to deliver services where they are needed. However the implications of the present study are broader than merely counting existing numbers in order to target service design and delivery, important as this may be.

When there are credible measures of problem gambling, then it is possible to conduct studies that may better estimate the occurrence and patterns of problem gambling. This will also enable the development of more effective preventive strategies and measures by government and others, and an improved capacity to evaluate such solutions in a timely manner. Thus the development of problem gambling measures is far from just a technical exercise.

The validation study informed by this report and due for completion in December 2003, should deliver a credible, reliable and practical set of measurement tools that will best serve the Victorian Government and community in future research related to gambling and problem gambling.

Background to this project

The Gambling Research Panel Research Program

This project has been commissioned by the GRP established by the Victorian Government.

The GRP was established in May 2000 in Victoria with the enactment of the *Responsible Gambling Act 2000*. The panel is comprises of three members. Prior to the establishment of the GRP, the Victorian Casino and Gaming Authority (VCGA) formed a research committee through which gambling research was commissioned. This research focused on the social and economic impact of gaming. The GRP has taken over this function has now devised a research program through a consultative process. A document describing the Panel's program is available from the Panel's website, http://www.grp.vic.gov.au

Project 1a from the GRP's program is the project reported upon in this document. However as Project 1b in the program is linked to the outcomes of the present study, it is useful to understand the relationship of the present study to the other components of the GRP's intended research program. The descriptions of the pertinent studies provided by the GRP in its 2001–2002 Research Plan are reproduced below:

Description of Project 1a Scoping Study: Evaluating the VGS against other recently developed instruments (Measuring problem gambling - Evaluation of the VGS)

Scope

Evaluate the VGS as outlined in the VGS research report on research commenced in 1997 under the previous VCGA Research Committee and published by the GRP (Victorian Gambling Screen, 2001). Evaluation will assess the VGS against other recently developed instruments, which purport to assist in identification of problem gambling, impact on families and gambling as a recreational pursuit.

Outcomes

Using in particular the North American SOGS and Canadian research on Problem Gambling Screens, this research will evaluate the scope, construction and scoring regimes of the VGS, ensuring that further development is timely and appropriate to the Australian research context. The research will identify any components of the VGS, which are ambiguous, unclear or redundant and refine scale items in the light of recent international and national research. It will guide decision-making on the efficacy of undertaking larger scale validation and self-scaling exercises.

Description of Project 1b Problem Gambling Prevalence Study: Validate the new VGS

Project 1b will proceed in the manner outlined below, subject to the scoping exercise outlined in Project 1a. Depending on the outcome of negotiations with other states, validation may incorporate co-operative research and co-funding models with other states.

Scope

Subject to Project 1a, further refine VGS and apply to a population sample for validation of the screen and insight into problem gambling in different communities.

Method

- Develop a best practice approach to administration of the VGS by telephone and face-to-face interview.

- Design a survey using the newly developed VGS to determine the incidence of problem gambling in various categories including gender, age group, geographical area, ethnicity, socio-economic level and smoking.
- Apply to a population sample for broader validation with a large enough sample to provide indicators on problem gambling in different communities and cross validate with other internationally used screens such as SOGS and CPGI.

Outcomes

- Availability of an Australian Gambling Screen that is superior to SOGS and overseas instruments, to be used as a tool in related research programmes.
- Improved targeting of problem gambling avoidance programmes and harm minimisation strategies based on results from application of VGS to population sample.
- The present project outcomes have, therefore, been devised with a view to informing the proposed Project 1b.

Project objectives and deliverables

The project brief specifies the following activities and deliverables to be undertaken and provided during the course of the project:

- Evaluate the report by Flinders Technologies Pty Ltd (Ben-Tovim, Esterman, Tolchard & Battersby, 2001) detailing the VGS with regard to refining the instrument for application in a population validation study;
- Evaluate the VGS against other available instruments including SOGS, the CPGI and other instruments and research in relevant international and Australian studies and assess whether the VGS overcomes the perceived shortcomings of these instruments;
- Assess the extent to which there are unique features related to problem gambling in Australia and the extent to which these are/could be adequately catered for in the VGS or a modified form of the VGS;
- Review the VGS study with regard to dimensions such as: validity and reliability of scale items, methodology, scope, the test re-test reliability of the instrument over time and application to the Australian context;
- Deliver a research design for a large scale (a) Victorian and (b) national validation survey that would have the dual purpose of validating the VGS and obtaining some useful information on characteristics of problem and potential problem gamblers; and
- Include in the research design details of appropriate survey questions, sampling, telephone survey and other techniques of data collection, as appropriate, to chosen sub populations that will cross validate the VGS with other instruments, and that will allow comparisons of a Victorian population study with other relevant, recent research in other States.

Some preliminary comments on the project design and purpose

The development and use of a standard tool or tools to monitor problem gambling within Victoria and other jurisdictions is a necessary and laudable objective. Such actions would potentially enable:

- The conduct of tracking studies to monitor the incidence and prevalence of problem gambling within the community;

- Benchmarking of problem gambling incidence and prevalence against past and current data within the Victorian and other jurisdictions;
- Evidence based resource allocation and program design for services and interventions targeted at people with gambling problems.

Although these goals are laudable, there has been considerable disagreement within the problem gambling research literature and amongst those involved in the regulation of gambling and problem gambling services as to the selection and use of the most appropriate measurement tools. Unlike in some academic debates, this debate impacts upon the resolution of issues such as 'how serious and widespread is problem gambling within the community?' and 'what should we do about it?' The Victorian community and communities in other jurisdictions desire pertinent, evidence-based answers to these questions.

As noted in this review, the debate surrounding the measurement of problem gambling has been complicated by the varied, disparate and, perhaps mutually exclusive, objectives and purpose pursued by the developers of the respective measurement instruments purported to measure gambling and problem gambling. In addition, we have found in our content analysis of these tools that there is a concerning lack of clarity as to the actual stated objective described within existing tools. This is an issue of concern since the utility of a measure is inexorably bound to its stated purpose. This report emphasises the need for clarity in defining the purpose or purposes of problem gambling measurement tools in order to determine whether or not they achieve their stated objectives.

We also argue in his report that there is a further lack of derivation of the measurement items within most tools from a clearly articulated model of problem gambling. Determining what to measure and how to measure it needs to relate closely to sound and validated conceptual models and theories. Thus some attention within this report is devoted to clarification of the issue of a theoretical model of gambling and problem gambling in order to meet the objectives of the project brief.

We now outline the activities that have been undertaken within the project in order to meet the research project brief objectives.

Project methodology

We discuss the activities undertaken within the project under the headings listed in the brief in order to illustrate their relationship to the goals specified in the brief:

Evaluate the Report by Flinders Technologies Pty Ltd detailing the VGS with regard to refining the instrument for application in a population validation study;

We have reviewed this report and the work reported within it. We have examined the literature analysis, the empirical and development work and the conclusions and outcomes detailed in the report for validity and feasibility with respect to a population validation study. We have used several conceptual and theoretical frameworks, described in the following sections, in performing this evaluation including De Vellis' scale development protocols and conceptual and a theoretical models of problem gambling and gambling uptake developed by us.

Evaluate the VGS against other available instruments including SOGS, the CPGI and other instruments and research in relevant international and Australian studies and assess whether the VGS overcomes the perceived shortcomings of these instruments;

We have collated the relevant literature and have conducted a detailed content analysis of the similarity and differences between the VGS and the other instruments. We have examined the reliability, validity, applicability and practicability of each of the tools and their application to specific study populations. A detailed content analysis has been conducted using a conceptual model developed by the authors of problem gambling antecedents, actions and consequences.

Assess the extent to which there are unique features related to problem gambling in Australia and the extent to which these are/could be adequately catered for in the VGS or a modified form of the VGS;

We have reviewed the evidence for such differences and provided a detailed account of them.

Review the VGS study with regard to dimensions such as: validity and reliability of scale items, methodology, scope, the test re-test reliability of the instrument over time and application to the Australian context;

We have examined the psychometric properties of the VGS including the following standard criteria:

- Item difficulty;
- Item scale correlations;
- Coefficient alpha;
- Criterion-related validity correlations;
- Factor analysis.

We examined these properties by running analyses of the data collected in the original validation exercise performed by the Flinders Group in their development studies.

Deliver a research design for a large scale (a) Victorian and (b) national validation survey that would have the dual purpose of validating the VGS and obtaining some useful information on characteristics of problem and potential problem gamblers; and

Include in the research design details of appropriate survey questions, sampling, telephone survey and other techniques of data collection, as appropriate, to chosen sub populations that will cross validate the VGS with other instruments, and that will allow comparisons of a Victorian population study with other relevant, recent research in other States

We have developed and documented a research design for this purpose including consideration of:

- Confidentiality and anonymity issues;
- Recruitment methodologies with respect to sample bias;
- Issues in reaching all study segments and sub-populations especially for groups from CALD backgrounds and those who may wish to 'hide' their gambling activities;
- Response bias and validity;
- The virtues and problems of different survey response methods;
- How to compare VGS results with the results of other tools;
- A national study.

Outcomes of the literature analysis

Our initial task in the literature analysis was to find measures of problem gambling that ought be included in the present study. The ones that we selected were:

- The South Oaks Gambling Screens;
- The Canadian Problem Gambling Index;
- The Victorian Gambling Screen Content Analysis;
- The DSM–IV diagnostic criteria;
- The GA 20 Questions;
- Life Area Measures.

These tools are the ones that have been most frequently used in local and international studies of gambling and problem gambling. They are in a real sense, the industry standards. The detailed content of each of these measures is presented in a later section of this report.

What is the current knowledge about rates of problem gambling in Victoria?

A prior question that needs to be answered is how problem gambling is defined. Of course rates of a condition are inextricably bound up with how it is defined. There are many definitions that have been offered in the literature and by government. Some important examples follow:

> *'Problem gambling refers to 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 ... '* (Australian Institute for Gambling Research, 1997);
>
> *'Problem gambling is any pattern of gambling behaviour that negatively affects other important areas of an individual's life, such as relationships, finances or vocation. The mental disorder of "pathological" gambling lies at one end of a broad continuum of problem gambling behaviour ... '* (Volberg, Moore, Christiansen, Cummings and Banks 1998);
>
> *'Problem gambling is defined as a chronic failure to resist gambling impulses that results in disruption or damage to several areas of a person's social, vocational, familial or financial functioning … Excessive gambling is used to describe a level of gambling expenditure that is considered to be higher than can be reasonably afforded relative to the individual's available disposable income and as a result produces financial strain ... '* (Blaszczynski, Walker, Sagris and Dickerson, 1997).

As we shall discuss further later, Blaszczynski's definition is one of the few to include explicit mention of both an underlying condition as well as its symptoms and consequences.

Although there is now a substantial international literature on the prevalence of problem and pathological gambling within the community, there remains considerable uncertainty as to the actual rates of problem gambling within different communities and jurisdictions. This is in no small part due to variations in definitions of problem gambling as well as methodological issues and problems in the conduct of the survey research.

In our view, the construct and dimensions of problem gambling is currently ill-defined as reflected in the diffuse array of terminology and criteria used to describe and define the condition. We consider that this situation arises out of the lack of conceptual clarity and agreement as to whether

problem/pathological gambling is best construed as a dimensional behaviour (i.e. something that is a continuum along which people vary in extent) or a categorical disorder (i.e. something that you have or do not have). This conceptualisation is inextricably bound up with the positions of those attempting to define it.

Consequently, tools that engender definitions of problem gambling that are focused on screening and diagnostic purposes may assign greater importance to items relating to impaired control rather than items that are concerned with the presence of some form of harm. Items assessing impaired control include the failure to resist the urge to commence gambling, repeated unsuccessful attempts to cease episodes of gambling and gambling more time and money than intended. Harm is determined according to manifest deleterious consequences associated with gambling although the nature, extent and severity of such harm are often not specified (Australian Institute for Gambling Research, 1997; Ferris, Wynne & Single, 1999). This has led to a situation where a heterogeneous group of gamblers are included in samples making cross-study comparisons difficult.

It is argued that greater attention needs to be paid to clarifying and differentiating the various terms used interchangeably in the field. There is an apparent tendency in the literature to assume that terms such as gambling problems, problem gambling and problem gambler are synonymous and/or can be used interchangeably without regard to the subtle but often important nuances contained within the meaning of each descriptor.

'Problem gambling' can be used to describe both the behavioural characteristics and the outcome of a style of gambling including the use of excessive amounts of time and/or money and poor decision-making strategies.

'Gambling problems', on the other hand, relates only to the negative outcome of gambling without necessarily implying excessive levels of expenditure or patterns of 'problem gambling', that is, a problem gambler ('a case'). To illustrate, marital discord may arise from a spouse having strong religious sentiments surrounding gambling as inherently 'sinful' (e.g. the Seventh Day Adventist, Mormon or Muslim religions) that come into conflict with his/her partner's regular but minimal gambling behaviour. This may lead to recurrent arguments and marital discord, that is, harm is produced by gambling behaviour. However, such a gambler would not normally be considered to engage in problem gambling behaviours or to be a problem gambler. Yet, under the VCGA and CPGI such an individual would be classified within its boundaries.

The core component defining a 'problem gambler' is impaired control although there is some level of circularity in argument inherent in these definitions. The problem gambler develops negative consequences because of an inability to control behaviour, and negative consequences arise because the gambler has no control over behaviour.

There is a further group of gambling problems that has sometimes escaped attention. This is the situation where existing non-gambling related problems or conditions are aggravated by gambling behaviours. In illustration, a situation of marital disharmony and conflict may lead a partner to seek solace at a local gaming venue. Although the gambling may be contained within limits, the fact that the partner had gambled is in itself, raised by the other partner in criticism.

A focus on harm as the foundation of a measure is appropriate for the purpose of determining the socio-economic impact of gambling and excessive gambling within a community. It may also be useful in screening for individuals who have or may be at risk for developing into a problem gambler. The original purpose of the SOGS was to develop an instrument to identify possible problem gamblers attending a drug and alcohol facility, and select these out for further diagnostic testing. In this regard, half of the SOGS items are directed to the presence of harm as manifested by the need to borrow money. However, its use as a diagnostic tool to identify a 'case' of a problem gambler is of questionable validity and its use in surveys has only served to overestimate prevalence rates. This

point is well exemplified in the study conducted by Stinchfield (2002). In a comparative study of reliability, validity and classification accuracy of the SOGS, Stinchfield found that the instrument had good to excellent classification accuracy in gambling treatment samples but poor accuracy in general population samples with an 50 per cent false-positive rate.

Yet few studies or measures have attempted to distinguish between the above concepts in prevalence surveys showing a tendency to confuse 'cases' of problem gamblers (diagnostic) with the impact of gambling (harm).

The Productivity Commission (1999) estimated that 2.1 per cent of Australians had 'significant problems with their gambling' and that 2.0 per cent of Victorians fell in this category. The sixth and seventh Community Gambling Patterns and Perceptions Surveys conducted for the VCGA in 1998 and 1999 showed quite divergent rates of gamblers 'at risk' with rates of 1.5 per cent and 0.8 per cent respectively in the two studies. However, as Thomas and Yamine (2000) noted, these surveys seriously under-represented the numbers of people from different cultural backgrounds for whom it was expected that there might be higher rates of problem gambling than in the general community. These expectations were fulfilled when the Thomas and Yamine's study analysed of answers to the SOGS from respondents of Greek, Vietnamese, Chinese and Arabic cultural background found rates of problem gambling broadly five-times greater than in the general community. Their study also demonstrated the importance of survey methodology upon the obtained rates. They used interpreters and a targeted random sampling methodology that was different from previous studies where insufficient effort was made to engage people from different cultural backgrounds. The lack of recruitment of people from different cultural backgrounds into the study samples has compromised the representativeness of the survey sample.

There has been a wealth of relevant international studies, a selection of which are listed below:

- Abbott and Cramer (1993) performed a study involving the telephone interview of 420 randomly selected adult Nebraskans concerning their gambling activities. While the authors did not report rates of 'compulsive' gambling in their sample, 10 per cent of the 62 per cent of people who reported that they had gambled in the past year indicated they had experienced negative effects of gambling;
- Buhringer and Konstanty (1992) studied the prevalence of users of slot machines in the Federal Republic of Germany in a face-to-face interview study of 7,643 respondents. They found that 10.2 per cent of the population were active gamblers and that 0.7 per cent were 'intensive' gamblers who had used slot machines for five hours or more per week in the previous three months;
- Emmerson and Laundergan (1996) studied the changes in prevalence of gambling and problem gambling over a four-year period in the State of Minnesota. The 1990 sample consisted of 1251 respondents and the 1994 survey consisted of 1028 telephone interviews using randomly selected numbers. The SOGS–M modification of the SOGS was employed where the questions are re-phrased to reflect a time period of the last year over which the target behaviours are exhibited rather than the lifetime of the respondents. In 1990, the percentages of gamblers 'with some difficulties' were 11.3 per cent, gamblers with 'increasing negative consequences' (often the term 'problem gambler' is applied to this group) were 1.6 per cent and probable 'pathological' gamblers were 0.8 per cent. In 1994, the figures were 15.8, 3.2 and 1.2 per cent respectively for each group, suggesting growth in the sizes of these groups over the time period of the study;

- Ladouceur (1991) studied the prevalence of pathological gambling in a telephone survey of 1,002 randomly selected residents of Quebec using the standard lifetime prevalence version of the SOGS. This uses questions phrased to assess lifetime prevalence i.e. (Have you ever?). Ladouceur found what he terms the 'current' prevalence of pathological gamblers to be 1.2 per cent with another 2.6 per cent to be problem gamblers. In a questionnaire study of 1471 Quebec college students, Ladouceur, Dube and Bujold (1994), once again using the standard SOGS instrument, found that 2.8 per cent of the students were pathological gamblers and that 5.8 per cent were problem gamblers. Large sex differences were found with men more likely to be problem or pathological gamblers;
- Volberg and Steadman (1988, 1989) have studied a range of samples of United States communities over a period of years, using the standard lifetime prevalence form of the SOGS. Their 1988 study, involving the telephone interview of 1,000 randomly selected New York respondents, found problem gamblers made up 2.8 per cent of the sample and that a further 1.4 per cent was pathological gamblers. Their 1989 study of 1,750 New Jersey and Maryland residents, again using a randomly selected telephone interview methodology, found problem gambling rates of 2.8 per cent in New Jersey, 2.4 per cent in Maryland and pathological gambling rates of 1.4 per cent in New Jersey and 1.5 per cent in Maryland.

In a later paper Volberg (1994) reviewed the public health implications of her findings. She noted that:

> *'In states where legal gambling has been available for less than 10 years, less than 0.5 per cent of the adult population were classified as probable pathological gamblers. In states where legal gambling has been available for more than 20 years, approximately 1.5 per cent of the adult population was classified as probable pathological gamblers. Together these data support the long-standing contention of treatment professionals and researchers that increasing the availability of gambling will contribute to an increase in the prevalence of gambling related problems in the general population. ... '* (1994, p.239).

Thus according to Volberg, problem and pathological gambling prevalence rates are affected in quite important ways by systemic variables including the time period since the introduction of widespread legalisation of new gambling modes. This situation may apply to the context for the present study, the state of Victoria, where there has been strong growth in gambling opportunities following the Victorian government's liberalisation of gambling laws. But some caution is necessary in the application of Volberg's findings to the present context. Victoria seems to have a higher availability of Electronic Gaming Machines than the jurisdictions studied by Volberg and the spatial distribution of gambling services in Victoria may be more widespread. This may mean that that the pattern of slow growth in the prevalence of pathological gamblers described by Volberg may not be seen in Victoria but then again it may. Notwithstanding these various caveats, we consider that Volberg's work is of great importance in the debate concerning future trends in the rate of problem gambling within the community.

It is important to note that the validity of comparison of prevalence estimates cited in the above papers are affected by the type of prevalence estimate used and the definitions adopted to define problem and/or pathological gambling. In other words, in many instances, apples may be being compared with oranges and pears.

We also found within the literature several other issues that are pertinent to the present project. These include the issues of whether problem gambling is best conceptualised as a dichotomy or continuum and the purposes of problem gambling measures and tools. We now discuss these issues.

Is problem gambling a dichotomy or a continuum?

This is a fundamental design decision in the development of a problem gambling measurement scale.

The Productivity Commission report provides an especially clear discussion of this issue:

> *'The difficulty of identifying the "right" threshold for problem gambling stems from the fact that cases are only defined fuzzily when the severity of the problems varies along a continuum. In some areas of public health it is easy to define a case. For instance, someone either has HIV or they do not. But in problem gambling (and a range of other possible areas, such as obesity or diabetes) it is not clear where along the continuum people can be said categorically to have a problem. If the threshold is set low then obviously a lot of people are said to be "problem" gamblers ... '* (p 6.18–19).

In our opinion, this discussion in part originates from imprecision and ambiguity as to the conceptualisation of problem gambling and gambling problems and the purposes of problem gambling measurement tools within the literature. As we shall argue in the next section, measurement tools may have a range of purposes and the design of the tool needs to reflect that purpose or purposes.

Purposes of problem gambling measurement tools

Essentially we are of the view that such tools may be categorised as having five different purposes:

- A current diagnostic purpose (who currently has the problem?);
- A current severity classification purpose (how severe is the problem and what is the extent of its harmful consequences?);
- A predictive diagnostic purpose (who is at risk of developing the problem in the future?);
- An intervention design purpose (what is needed to treat the problem and ameliorate it?);
- A triage or screening purpose to refer the person for further assessment or action (what further assessment or action is required?).

It is important to note the distinction between diagnostic purposes and epidemiological purposes of tests. Frequently it is desired to assess the extent of a problem or condition within the community or population (i.e. the prevalence of the problem). This is the case in the present assignment where the primary purpose of the community prevalence study to follow on from this study will be to determine the prevalence of problem gambling within the Victorian community. However while the goal of this subsequent study may be to make assessments of prevalence issues, this does not sidestep the universal requirement for tests with a diagnostic purpose to be used to measure and classify ('diagnose') people so that sample surveys may then be used to determine prevalence of the target 'condition' within the community. Prevalence concepts can only make sense if there is a reliable and valid method of diagnosing or classifying cases into the target groups to be used in the prevalence studies. This is why when we refer to this purpose of problem gambling measurement tools to classify people into the appropriate categories as being 'diagnostic'. Prevalence is determined by doing a study of a population using classifications engendered within the diagnostic or classification measurement tools.

It is interesting and instructive to compare this range of purposes with the standard use of tests in conventional clinical domains. For example, in the case of a diagnosis of glandular fever, a Paul Brunel test may be applied to determine whether there is evidence of Epstein Barr virus infection in the patient. The diagnostic test which has the goal of determining whether the condition is present or not has very little to do with determining the plan for therapeutic intervention and also has little value for assessing the functional impact of the virus upon the patient. This is also a completely separate

venture from the use of predictive measures to determine the likelihood of contracting the virus. Yet our analysis reported in this document of measures of problem gambling shows that we frequently find many or all of these quite divergent purposes bundled into the one tool. This is not sound design.

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. While there is imprecision in the basic structure of this framework, we are doomed to ongoing pointless debate about whether one tool is 'better' than another or whether it over or under estimates the 'true' rates of the problem. This type of discussion is misguided and unhelpful as the GRP has correctly identified in the design of its research program.

In frameworks such as De Vellis' measurement tool development framework, the first step in tool development and validation is specified as 'Determine clearly what it is you want to measure'. This is good advice indeed.

To return to the issue of conceptualising problem gambling as a dichotomy or a continuum, we contend that it can be both depending upon the purpose of the measurement tool. Many clinical diagnostic measures with continuous distributions have points at which the value of a parameter is considered to be abnormal or problematic. The underlying parameter is a continuum but a cut-off point is chosen and assigned the purpose of categorising cases into 'normal' or 'abnormal'. The cut-off point is typically chosen on the basis of the underlying distribution of the parameter within the population and/or its relationship to known problems or conditions. In the gambling research context, scores on tools such as the SOGS have been used to categorise gamblers into groups such as pathological gamblers with a serious set of problems and problem gamblers with severe problems and lower scores. Such classifications are essentially arbitrary but they enable us to simplify our presentation of the issue and act appropriately. A further example of such a classification with which many are familiar is the serum cholesterol ratio measurement of 5.5, above which dietary or other interventions may be recommended. Of course there is no particular magic about the number 5.5, it is simply a convenient standard that has been found to be clinically useful. Such a cut-off point may simply reflect a level that is known associated with or is predictive of, the likely development of a problem. For example, such a ratio is associated with future harmful consequences such that an individual manifesting such a level can be considered at-risk even though he/she may be asymptomatic. In gambling, there is no agreed to level of expenditure of time or money that can be used as a cut-off point without including the presence of harm, that is, measures cannot predict at-risk gamblers who are currently asymptomatic.

Later in this report we discuss in more detail the issue of the determination of cut-off scores in problem gambling measures. We note that there are essentially four different methods of determining cut-off scores including:

- Relative frequency approach;
- Absolute value criterion approach;
- Expert judgment approach;
- Frequency distribution shape approach.

We provide advice as to the application of these approaches to the survey data to be collected in subsequent studies.

In addition to the conceptual underpinnings of problem gambling measures, there is also the issue of how should the tools be developed. There are, in fact, quite specific protocols that can and ought be applied to this task. Unfortunately many of the tools used to measure problem gambling have not been developed using systematic scale development approaches and their performance has suffered as a result of this issue.

How should problem gambling measurement tools be developed?

It is widely acknowledged that measurement tools need to have four desirable properties (see, for example, Polgar & Thomas, 2000):

- Reliability;
- Validity;
- Applicability;
- Practicability.

Reliability refers to the need for a test or measure to give the same result consistently. There are several different ways of measuring reliability including test retest reliability, inter-rater reliability and internal consistency.

Validity refers to the accuracy of the result. In clinical contexts, validity is frequently measured by specificity and sensitivity, referring to a test's capacity to correctly detect those with the target attribute and to correctly filter out those who do not have it.

Applicability refers to the ability to the test to be applied to the particular target group. For example, a test of suicide risk for young people may not be applicable to older people.

Practicability refers to the ability of a test to be practically applied in given contexts. For example, if the test requires two hours to be administered and high expense then it may not be suitable for a widely dispersed field administration context.

While there is a large literature on the desirable properties of measurement tools there is a much smaller literature on how to develop them. Protocols and standards for the development of measurement tools are much less common than the exhortations about what the outcomes should look like.

De Vellis' Tool Development Protocol

De Vellis (1991) advocates an eight-step process of measurement scale development. These are:

- 'Determine clearly what it is you want to measure';
- 'Generate an item pool';
- 'Determine the format for measurement';
- 'Have initial item pool reviewed by experts;'
- 'Consider inclusion of validation items';
- 'Administer the items to a development sample';
- 'Evaluate the items';
- 'Optimise scale length'.

We have found De Vellis' protocol to be particularly useful and have used it in several previous major tool development projects including the development of the Work Ability Tables, the Post Acute Care Risk Screen, the RACGP National Patient Satisfaction questionnaire, and in the development of the gambling-specific measures — the Counsellor Task Analysis (Problem Gambling) and the Victorian

Problem Gambling Family Impact Scale. The Work Ability Tables are a key element of the determination of the eligibility of applicants for the Australian Disability Support Pension. They are intended to measure the ability of people to work. To date, some AUD$40 billion of expenditure has been allocated using this tool. The Post Acute Care Risk Screen was developed to screen patients being discharged from acute care facilities into the community to determine their need for post discharge services. The Screen is now used throughout Australia. The RACGP National Patient Satisfaction questionnaire was developed to measure the satisfaction of patients with the services provided by general medical practitioners. It is used as a routine part of the quality programs for vocationally registered General Practitioners throughout Australia. We consider that the widespread uptake of these measurement tools and their robustness is directly attributable to the robustness of the De Vellis tool development protocol used in their development. This is why we advocate De Vellis' framework for the present study.

Let us now discuss each of the steps proposed by De Vellis:

1. 'Determine clearly what it is you want to measure'

Prior to the development of any tools, it is necessary to clarify exactly what it is that is going to be measured. In the present problem gambling context, we argue in this report that this is an area that has not received sufficient attention in the development of several of the major existing tools. We consider that the purposes of these tools have not been clearly specified and in some cases the breadth of the specified measurement goals is so large as to be difficult to see how such disparate goals could be achieved in the one tool.

2. 'Generate an item pool'

The generation of an item pool can occur in a variety of ways, essentially corresponding to inductive or deductive methods. The deductive method involves the derivation of the items from a theoretical model of the phenomenon being measured and from a stated measurement model. The inductive method involves a detailed examination of the content of current tools and research concerning the phenomenon. This process can also be very usefully informed by analysis of the literature surrounding the target concepts.

3. 'Determine the format for measurement'

An important design decision is the scale format of the items in the tool under development. As discussed in Polgar and Thomas (2000), there are virtues associated with different types of response categories. The types of scale formats that are usually considered for use with measurement tool items are: (i). Likert type (ii) Forced choice (iii) Dichotomous (iv) Numerical rating scale.

4. 'Have initial item pool reviewed by experts'

Review of the item pool that has been generated using the previous steps in the process is a particularly useful procedure. By 'experts' we not only mean academic experts but also those who are 'expert' in the phenomenon being measured. In the present context this includes people with gambling problems. We have found the conduct of focus groups involving members of the target measurement population to be a particularly effective method of item review. Equally, those who are to administer and use the outcomes of the measurement tool should be involved in focus discussions about it. While it is common practice to provide exposure drafts of tools to prospective users and 'experts' for individual comment, the stimulation of a focus group discussion can provide a much richer review than individual commentary.

5. 'Consider inclusion of validation items'

In De Vellis' exposition, the inclusion of validation items may be achieved in several different ways. Some psychological tests such as the MMPI have truth sub-scales where items that are demonstrably true or false are scored to form a measure of the truth of the responses. Others include 'gold standard' measures where externally verifiable measures of the phenomenon are included to validate responses to other items.

In many circumstances, including the problem gambling context there is no gold standard measure of the attributes in question. Therefore, this step is not especially useful in this context.

6. 'Administer the items to a development sample'

It should be accepted that the first run or first few runs of the scale is a development exercise. No matter how carefully the earlier steps have been implemented, there are statistical and logistic issues that cannot always be predicted at the early design stages. It is sometimes useful to use a pilot with a small group of people drawn from the target population to pilot the tool, prior to larger trial with a development sample. The tool is administered to a pilot sample and they are then interviewed about ease of completion, understanding or confusion about items and so on. These results then form the basis for changes to the tool. We strongly advocate a workshop or focus group format for this task.

7. 'Evaluate the items'

Once the measurement tool has been administered to a reasonable development sample of respondents, there is a wide range of statistical techniques available to analyse the items of a scale. These are described below.

Item difficulty analyses

The patterns of responses to all items should be investigated with a view to identifying high and low difficulty items. Test discrimination performance is improved by a more equal distribution of responses over the response categories rather than highly skewed distributions.

Item scale correlations

All items should be correlated with their respective scale and sub-scale totals to examine the contribution of all items to scale variance. Low contribution is considered to be psychometrically undesirable.

Coefficient alpha

Alpha should be calculated for all scales and sub-scales in order to examine the dimensional structure of the items. High alpha indicates a high degree of communality between like items, a psychometrically desirable phenomenon.

Criterion related validity correlations

Each scale should be correlated with each other to examine the patterns of associations between them. Other key criterion variables should be entered into these analyses as a validation check; e.g. ever having sought assistance for gambling problems.

Factor analysis

Factor analysis should be conducted for all tools to examine the internal structure of each.

Cluster analysis

Cluster analysis can be used to examine whether there are identifiable clusters or groups of respondents with similar characteristics that are identifiable from common patterns of responses to the measurement tools; e.g. problem gamblers, attendees at problem gambling services, non

gamblers and so on. The use of cluster analysis is a useful tool to examine the validity of typologies such as those proposed by the CPGI.

8. 'Optimise scale length'

There are competing requirements for scale length. Long scales (i.e. scales with many items) sample a wide range of aspects of the attribute(s) being measured (i.e. may have higher validity). It is also known that in psychometric theory that scale length promotes greater reliability. The Spearman Brown formula is a means of actually estimating the effects of lengthening or shortening a scale upon its reliability. All other things being equal a longer scale may have higher validity and reliability than a shorter version of the same scale. However, this is by no means a certain outcome.

On the other hand, short scales have high practicability and the loss of reliability and validity may be negligible if the attribute being measured by the scale is tightly defined. In clinical settings, provided reliability and validity are not sacrificed, short scale length is very useful indeed, because of the very tight timelines that now operate in most clinical settings. In fact, the choice in these settings may not be between the use of a short scale and a long one but a short one and the abandonment of its use altogether. Most health and human service practitioners are busy people, so short scales are desirable without sacrifice of scale validity and reliability.

The shortening of scale length is achieved by deletion of poorly performing items. Poor performance of an item can be detected and defined by the following attributes:

- Very low or very high item difficulty. If everyone passes or fails an item, then it is not useful as a means of discriminating between different target groups because it adds little discriminating information. Items with extreme difficulties also have low variances and co-variances that means that their ability to predict or correlate with other variables is reduced;
- Items that correlate poorly with a criterion variable should be deleted from the scale as little or nothing is to be gained by collecting this information.

Another method of selection of items for deletion is low correlation with other items. In classical test theory, it is desirable that items correlate highly with each other in order that they are measuring the same attribute. In this study, the target attribute is whether the person has or has had a problem with gambling Thus items with low correlations with other items are marked for deletion under this approach.

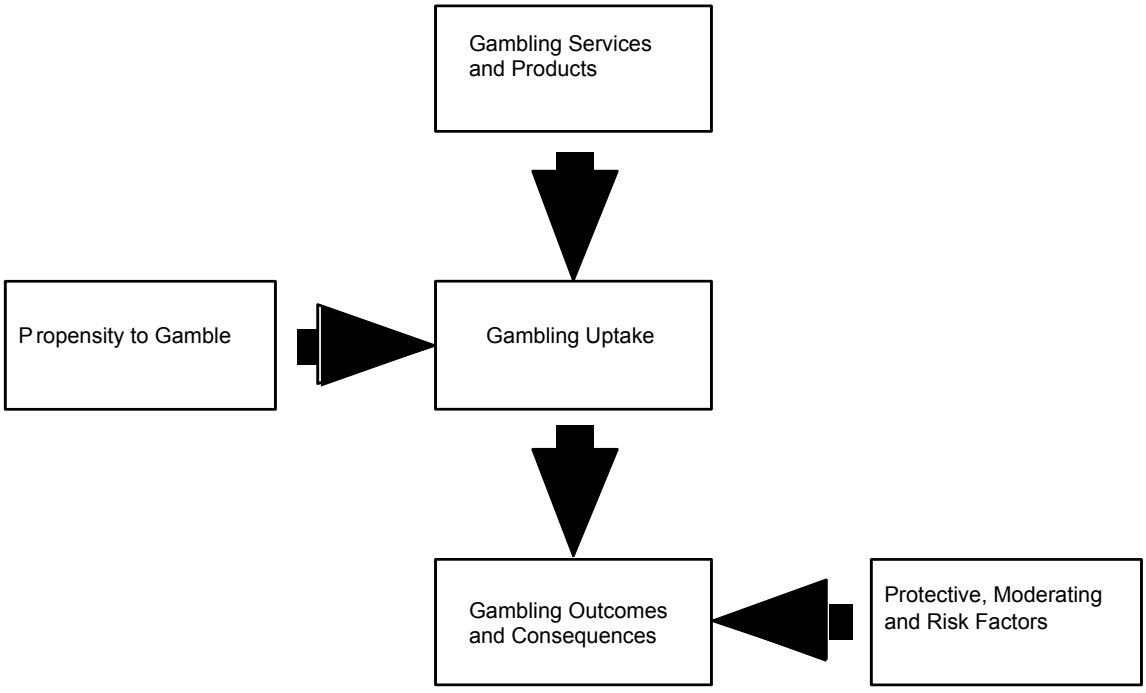
A variant of the above approaches is to conduct a factor analysis of the tool in order to see whether items tend to cluster together. In simple terms, the purpose of factor analysis is to determine whether there are factors or clusters of variables that are correlated with each other. In a situation where all items correlate highly, it is usual that the factor analysis yields a one-factor solution meaning that the items are broadly measuring the same quality or attribute. However, other outcomes are possible. There may be several factors or latent variables that underlie the screening tool items. The items with high loadings on the main factor would be retained and those with low loadings would be deleted. This is a more sophisticated version of selection of items with high inter-correlations and high co-variances for inclusion in the scale and deletion of other items.

De Vellis' protocol is a very useful one for the development of measurement tools and the evaluation of development processes. For this task in the present assignment where we have been asked to evaluate the development of the VGS measurement tool, we have elected to use De Vellis' protocol as the evaluation benchmark.

According to De Vellis' approach, a key feature of the design of any measurement tool is a clear definition of its intended purpose and the populations to which it can be reliably and validly applied.

The design of a measurement tool also includes, whether implicitly or explicitly, a model of the phenomenon being measured and how it has come about. That model is influential in how we decide which items to include and to not include. Unfortunately, most of the existing problem gambling measurement tools are neither informed by a detailed consideration nor exposition of the underlying model of problem gambling. Frequently, they have been developed using a panel nomination of inductive process, sometimes combined with an informal deductive method where their own personal and unstated model of problem gambling has been given free rein. In addition the measurement model and its assumptions are rarely stated. This complicates considerably the issue of determining tool content based upon a sound theoretical perspective. This is a most unsatisfactory arrangement. We therefore provide an explication of a useful problem gambling theoretical framework for the purposes of the present study.

The model of influences on gambling behaviours and outcomes



This model was first proposed by Thomas and Yamine (2000) and it was subsequently used as the conceptual underpinning of our evaluation of Victoria's BreakEven Problem Gambling Counselling Program (now Gambler's Help). The model asserts that the gambling uptake for individuals is influenced by varying intrinsic propensities to gamble and the availability of gambling products and services to that individual (Thomas & Jackson, 2002).

It is further asserted that the outcomes and consequences of gambling are influenced by gambling uptake and that various protective, moderating and risk factors impact upon propensity to gamble, the availability of gambling services and products and also the outcomes and consequences of gambling uptake upon gamblers, their families and the community.

Propensity to gamble

In the model it is assumed that people vary in their propensity and desire to gamble. The propensity to gamble may be influenced by a variety of factors. These factors have been shown to include personality factors such as impulsiveness/impulse control and risk-taking. It may also be affected by other behavioural propensities. A common finding amongst people with gambling problems is that they also have other behavioural problems (Spunt, Dupont, Lesieur, Liberty, Hunt, 1998). Black and Moyer's (1998) US study has shown that people with 'pathological gambling' frequently have substantial psychiatric co-morbidities. Of course this does not necessarily mean that people in the 'normal' gambling range also have addictive and psychiatric co-morbidities or that all people with gambling problems have other behavioural problems. However the associations are of considerable interest.

Evidence for intrinsic factors affecting gambling behaviour is also provided by a fascinating study of 3,359 twin pairs (Eisen, Lin, Lyons, Scherrer, Griffith, True, Goldberg, Tsuang, 1998). According to Eisen and colleagues, inherited factors explained 62 per cent of variation in the study sample in the diagnosis of pathological gambling disorder and lower amounts of variance in the elevated but 'normal' ranges of gambling behaviour. This study may provide some evidence for inherited factors influencing propensity to gamble.

Much of the research views the issues from a psychological and/or psychiatric framework, and thus focuses on the personal characteristics of the individual gambler. There is limited research from a sociological perspective on the social and contextual factors associated with the propensity to gamble; e.g. family or community factors. One factor that has been found in overseas studies to be predictive of propensity to gamble is the family environment and exposure to gambling activity within that environment. Women, particularly those living in isolated communities, have also been shown to take up gambling at a higher rate than might otherwise be expected (Brown, Johnson, Jackson, Fook, Wynn, Rooke, (2000); Crisp, Thomas, Jackson, Thomason, Smith, Borrell, Ho, Holt, (2000). Once having taken gambling up, women have also been demonstrated, in some studies, to progress to problematic levels of play at a rate faster than men (Grant & Kim, 2002).

In terms of the impact of cultural factors upon propensity to gamble, there is little published data concerning this issue, although some recent work addresses this issue (Thomas and Yamine, 2000). Thomas and Yamine found very high relative rates of problem gambling as determined by the SOGS within the Arabic, Greek, Chinese and Vietnamese speaking communities in Victoria. The relationship between cultural background and propensity to gamble is not well researched but it is assumed that common cultural values attitudes and beliefs concerning fate and luck may be influential. However, as pointed out by Thomas and Yamine, the high rates may be merely an artefact of the immigration experience. Further research is needed to examine the influences of these factors.

Gambling services and products

Gambling uptake and patterns are, of course, influenced by the availability of gambling products and services. In Victoria during the 1980s, for example, access to gambling was strictly limited. At that time there were no legal EGMs in clubs and hotels. During the 1990s there has been a widespread liberalisation of access to gambling products and services across the state, particularly EGMs in clubs and hotels (see McMillen, Jackson, Johnson, O'Hara, & Woolley, 1999 for a review of gambling history in Australia and Victoria). The use of any product or service is affected by its availability, marketing and how well it meets the needs or expectations of its consumers. Rachel Volberg (2001), the *British Medical Journal*, reviews the strong evidence for this link between gambling availability, gambling behaviour and problem gambling.

The impact of geographical distribution of EGMs upon gambling uptake and rates of problem gambling has been reported in the Productivity Commission's report on Australia's Gambling Industries. The report includes an analysis of data collected by the Problem Gambling Research Program that shows a strong linear link between distribution of EGMs and the rates of new problem gamblers in Victorian regions. The Productivity Commission's study hypothesised a positive and statistically significant relationship between gambling-related problems and:

- accessibility to gambling, particularly the number of gaming machines; and
- high average annual expenditure on gaming machines.

Government can impact upon the rates and distribution of gambling services uptake through regulating the distribution of gaming services and the nature of such services within its jurisdiction. The nature of the gambling services and products as well as their distribution can also have important influences upon gambling service uptake. The availability of high denomination note-feeding devices, for example, has been the subject of review within many jurisdictions and has been of considerable concern to both governments and gambling service providers because of it potential impact upon uptake of gambling services. Other contextual factors can impact upon uptake. For example, clock displays, the removal of ATMs from gaming areas, betting restrictions, the machine display of amounts wagered rather than units and enforced breaks in play are factors that have been hypothesised to impact upon rates of gambling uptake.

Gambling uptake

The model asserts that gambling uptake is influenced by both the personal characteristics of the gambler, i.e. propensity to gamble, and contextual factors such as the availability of services and products for them to exercise these propensities. Uptake can be modelled demographically and also spatially to examine uptake of different products and services by application of tools such as the Gambling Activity Index (GAI).

Protective and risk factors for gambling propensity, uptake and outcomes and consequences

Each of the major model elements — gambling propensity, uptake, and outcomes and consequences — has associated with it a set of related protective, moderating and risk factors. It is important to understand these factors in order to be able to design appropriate interventions at each level and also to be able to target services and assistance to those who most need them. The identification of risk and protective factors engenders the identification of potential interventions to modify those factors that are amenable to change.

Propensity risk and protective factors relate to the social and demographic characteristics of gamblers and problem gamblers and their previous experiences of gambling. We know from analysis of the research literature and analysis of records concerning community gambling patterns and the presenters to problem gambling counselling services, a considerable amount about people with high and low propensities to gamble and to progress to problem gambling status.

We can alter the propensity to gamble and to become a 'problem gambler' by targeting at-risk groups with appropriate communications in the community and in settings such as schools. These campaigns would attempt to moderate propensity to gamble.

The design of gambling services and their marketing and dissemination within the community have important impacts upon the uptake of gambling services. As previously discussed, government can regulate to change accessibility to services and the service design and delivery. Venue caps or limits, the introduction of a gambling venue no smoking policy, play breaks, low-denomination note feeders

and other interventions have all been trialled in an attempt to alter gambling uptake amongst targeted groups.

The outcomes and consequences of risk factors include the social and financial resources that the gambler brings to their gambling activity. While gambling problems have important psychosocial elements, a major cause of identification of 'problem' gambling is that of insufficient money to pay all debts and fund everyday activities and the consequences of this inability to pay. Of course, while there may be psychosocial consequences of problem gambling — e.g. poor interpersonal relationships with spouse and family, and preoccupation with gambling to the exclusion of other important issues — it is when the financial resources are insufficient to meet the requirements of the gambling activities that the major identifiable problems and consequences become apparent (McCormack, and Jackson, 2000).

If the person has low financial resources to meet the requirements of their gambling activities, this is a risk factor for negative consequences of the gambling. On the other hand, if the resources are substantial then this may be a protective factor. For example, it is noted that unemployed people appear at twice the expected rate in presentations to Victoria's BreakEven problem gambling services (Jackson, Thomas, Thomason, Holt, McCormack, 2000). While this may be a consequence of other factors, it is nevertheless the case that unemployed people do not have major resources to fall back upon to service their gambling requirements.

To develop a gambling problem and the associated potentially negative consequences of the problem takes place over time, perhaps a very extended time period. Volberg's (1994) findings that problem gambling rates increase steadily with time in new gambling jurisdictions are probably reflective of this fact as well as issues such as market uptake.

Social and family supports or the lack of them also appear to be important protective and risk factors for negative outcomes of gambling activity. It is noted from the BreakEven Client and Service Analysis studies conducted for the Victorian Department of Human Services, for example, that people who are divorced or separated appear at twice the expected rate in presentations to problem gambling services (Jackson, Thomas, Ross & Kearney, 2001). While this may be either a cause or a consequence of the problem gambling, it is very well known from other research literatures that social supports are a key protective factor for adversity (see, for example, Bowling's 1994 review).

Implications of the problem gambling model for measurement of problem gambling

The model presented above has important implications for the construction of problem gambling measures. It suggests that propensity to gamble, actual gambling behaviour and its consequences are all legitimate components of the problem gambling content domain. Depending upon the purpose of the measurement tool each domain could and should be represented in items that make up the tool. We present this in our conceptual model of components of problem gambling:

A conceptual model of the components of Problem Gambling

Propensity/Attitudes to gambling	Attitudes to gambling Ideation about gambling Beliefs about control of gambling
Gambling behaviour and activties	Frequency of gambling behaviour Spend on gambling activities Gambling patterns, loss chasing
Consequences of gambling activities	Impact on job, family and friends Criminal behaviour Deception

We consider that the emphasis of the measurement tool on each of the components ought be linked to the purpose of the tool but also that each is a legitimate component of problem gambling in its own right.

Later in this report we apply the model to a detailed content analysis of each of the relevant problem gambling measurement tools.

There is also a very serious issue in the use of problem gambling measurement tools in assessing the prevalence of problem gambling within targeted groups and the community. As will be discussed below, there has often been considerable imprecision as to what is meant by the assessment of prevalence. There are in fact, three different types: period, point and lifetime prevalence and they have different measurement requirements. We now turn to a discussion of this issue.

Period, point and lifetime prevalence measurement considerations

When we talk about measuring how many problem gamblers there are in the community or the 'prevalence' of the problem, some care is needed in the use of terminology. In discussion of the prevalence of problem gambling in many of the published studies, there is sometimes considerable imprecision as to what is meant by 'prevalence' and the type of prevalence being described. In standard epidemiological terminology (see for example Christie, Gordon & Heller, 1997), the incidence of a condition within a population is defined as the number of new cases occurring within a specified time interval. Point prevalence is the number of cases that have the condition within the population at a specified point in time. Period prevalence is the number of cases that have the condition over a specified period of time. Lifetime prevalence, for example, is the number of cases within a population that will have the condition over the lifetimes of the individuals comprising the population. These prevalence definitions and their associated values within populations are quite different and it is important that the quotations of prevalence data include a clear specification of which type of prevalence is being quoted. For example, lifetime prevalence for serious back injury may be 90 per cent within the general population but the point prevalence may be only two per cent at any one time.

In the context of tools designed to measure the prevalence of problem gambling, the use of terminology such as 'Have you ever' performed the target behaviour is assessing a period prevalence over the person's lifetime to date. The use of terminology such as 'Have you in the last six months' performed the target behaviour is attempting to assess the period prevalence over six months. The use of terminology such as 'Are you currently' or 'have you recently' is assessing point prevalence for the particular moment at which the question is being asked. Of course, these different terminologies will yield widely different prevalence results. The SOGS–M where the respondent is quizzed about target behaviours over a 12-month period should yield quite different results from the standard SOGS where lifetime 'Have you ever' questions are asked. If however, problem and pathological gambling is a lifelong affliction, that when obtained is never shaken, then the questions may well yield the same results for point, period and life time prevalences, except where a young population, in which lifetime rates would be lower, is sampled.

Knowing the point prevalence or the 12-month period prevalence of problem and pathological gambling is very important for problem gambling service planning and for assessing the true impact of problem gambling upon the community. Problem and pathological gambling services based on the assumption that life time rates of problem and pathological gambling somehow represent the numbers of people that currently require services may have vast over capacity. This is because lifetime prevalences are generally substantially greater than point or period prevalences. A knowledge of the prospective pool of people who require services is informed by the incidence data

(i.e. new cases) and period prevalence data where the period corresponds to the planning period for the service. Thus, in most instances, 12-month period prevalence and 12-month incidence data would provide a sound basis for service planning and estimation of prospective client numbers as well as estimating the impact of problem gambling upon the community.

Of course, we must also note that not all prospective clients turn into actual clients. Lifetime prevalence data, which are yielded by tools such as the standard SOGS, do not provide a sound basis for service planning where the point or 12-month period prevalences are the required data unless we happen to know the relationship between the different rates.

In addition to concerns about the imprecise quotation of prevalence data without clearly specifying the type of prevalence being quoted, there is a further issue in the use of epidemiological principles and terminology in the problem gambling literature. In medical epidemiology, in many instances there is an incontrovertible test for the presence of the condition for which the prevalence is being estimated. Thus with discussions of conditions such as HIV, while there may be some uncertainty concerning population prevalence because of sampling difficulties, the existence of the target condition in individuals in principle can be readily determined by the application of the appropriate gold standard test. However, problem gambling measures involve the use of social constructs and self-reports by the target population with the 'condition'. The use of HIV as an analogous example for the 'diagnosis' of problem gambling is flawed, as there is no incontestable definition of what problem gambling is and how it should be measured in the sense that one can detect the presence of a problem gambling virus. The medical condition analogy is flawed. However, even within the medical literature, social constructs such as 'disability' are widely used to describe socially constructed conditions. And just as in problem gambling, disability can have profound negative effects upon the well being of the people with it.

There may be substantial measurement error in these self-reports induced through, for example, incentive to conceal problems. Walker (1992) has issued a number of warnings about the use of instruments such as the SOGS to measure the prevalence of problem and pathological gambling based on concerns about the accuracy of self-report data. However, it must be noted that the implementation of 'objective' measures would be very hard to implement and would likely involve violations of privacy.

The use of self-report measures to determine, for example, disability status would be seen in mainstream medical epidemiology as quite odd, whereas in the problem gambling literature, the use of self-report measures is quite routine and unchallenged. The use of prevalence rates and other quantitative estimates should not mask the fact that problem gambling is a social construct that does not have the same tightness of definition nor gold standard tests that the occurrence of conventional diseases or conditions may have. This means that measurement error and erroneous classification decisions may affect prevalence estimations of rates of problem and pathological gambling in ways not represented in conditions with tighter tests and criteria.

Thus, the estimates of the prevalence of problem and pathological gambling need to be considered carefully in the context of exactly what type of prevalence is being quoted. There has been, in our opinion, some considerable laxity in the use of different types of prevalence without appropriate consideration of what these differences mean for planning services and assessing community impact. In the development of tools and measures of rates of or prevalence of problem gambling within the community, the type of prevalence being measured must be clearly specified.

This takes us to the issue of cut-off points for the different measures. How do researchers determine when one is classified as a problem gambler or not? Or disabled or not? There are several different approaches. Once can use a relative frequency approach. For example, it might be decided that the purpose of the tool is to detect aberrant or extreme or statistically rare cases. So the cut-off might be

set at the point where the top five per cent of cases fall. This is a relative frequency approach, where the scale points are assigned no particular credence other than relative to one another. Another approach might be to ascribe meaning to the scores and to adopt an absolute value criterion approach. So if for example, you spent 110 per cent of your disposable income on gambling, this might be set as a standard at which problem gambling is assumed to occur. Another approach would be to use an expert judgment approach where you asked experts to decide whether a particular pattern of scores represented 'problem' gambling and to then use that criterion. Another approach is to examine the shape of the frequency distribution of the scale scores and select a point on that distribution.

The process of setting of cut-off points for gambling measurement tools has been quite lax. The description of the setting of cut-off points within most of the tools has been described poorly and has been the focus of considerable disagreement. In order to set appropriate cut-off points for gambling measurement tools within the Victorian community, we need a robust large scale study to implement the various approaches available to us in setting cut-off points and to arrive at a common approach and outcome. The methodology for development of cut-off points is described in the chapter entitled 'The design of the forthcoming validation study' later in this report.

Outcomes of the analysis of the Flinders VGS report

Following on from the literature analysis and conceptual development, the next step was to analyse the report concerning the VGS from the Flinders Technologies group.

Analysis of the Flinders report

The Flinders report outlines an integrated research program in which the VGS was developed. Our critique of the report centres on the areas nominated in the project brief and also De Vellis' tool development protocol as previously described.

The first stages of the work reported by the Flinders group involved detailed analysis of the problem gambling research measurement literature, and consultations. Focus groups were conducted with a range of participants including community members, participants in a gambling treatment program, and regular gamblers from a variety of cultural backgrounds and locations. This work proceeded well.

Based on these investigations, a draft version of the VGS questionnaire was developed and administered to 138 respondents by face-to-face, and computer-assisted telephone interview methods. Item and scale analysis techniques were used to select the items that made up the pilot version of the VGS.

The pilot version of the VGS was administered to 239 gambling respondents in the survey who were solicited from the following sources:

- 71 from a door-to-door random survey;
- 79 from a survey undertaken at the exits from gaming venues;
- 22 from problem gambling treatment settings; and
- 67 from 'miscellaneous' sources.

A pilot validation exercise involved expert panel judgments in which 71 of the research study survey participants were categorised into 'Non-problem', 'Borderline Problem' or 'Problem gamblers', based on case data. The participants were also given a diagnosis of pathological gambling according to the DSM–IV criteria as well as completing the SOGS The correlation between the VGS and SOGS scores was found to be r =0.87. This is quite high, as 1.0 is the maximum possible value. The pilot validation exercise was methodologically strong and innovative.

The final version of the VGS has three sub-scales derived from summations of various items:

- Harm to Self;
- Harm to Partner; and
- Enjoyment of Gambling.

The Harm to Self sub-scale is central to the identification of problem gamblers. Indeed one of the issues with the final version of the VGS is whether it is necessary to include the Enjoyment of Gambling material. The Enjoyment of Gambling material fits into the 'propensity to gamble' component of our conceptual model of problem gambling. Presumably, if one reports a high level of enjoyment then this is consistent with a high propensity to gamble. At first glance, these items may appear to be inconsistent with a measure of problem gambling, but they in fact tap into important

propensity issues. Their retention or deletion is really an empirical issue at the end of the day based upon an assessment of the psychometrics properties of the tool. In that respect, they certainly fit the requirements, as the psychometric properties confirmed by our analyses are excellent.

The report provided by Flinders contains a comprehensive set of scale development and item analyses. Additional confirmatory analyses were run by us using data kindly provided to us by the Flinders researchers. We ran confirmatory analyses as follows:

- Item difficulty;
- Item scale correlations;
- Coefficient alpha;
- Criterion related validity correlations;
- Factor analysis.

The analyses we conducted confirmed the Flinders group findings that the tool they developed is psychometrically robust according to the standard psychometric criteria. The Flinders report includes detailed discussion of these issues to a high standard.

The Flinders group in their report (Ben Tovim, Esterman and Tolchard, 2001) state that:

> *'In the next phase of its development, the scale needs to be administered to a larger sample. As it stands, the standard error of any estimate of prevalence of problem gambling in the small sample used to develop the scale is large (± 3.8 per cent) relative to the likely prevalence of problem gambling. That reflects a small sample size that cannot be used to estimate problem gambling in the community with any degree of accuracy (i.e. the scale awaits validation on a larger and more representative sample) ... '* (p.3)

This statement correctly identifies the fact that the validation samples within the study were not sufficient to provide a final assessment of the tools performance in a community study.

The Flinders document outlines a comprehensive and credible research program culminating in the development of the VGS tool. The work is sound and well-executed within the parameters specified within the brief that drove the project.

However, there are issues with the VGS and other tools that need to be discussed and resolved. These include the tool purpose and the derivation of the items from a theoretical and conceptual framework.

While it is not confined to this scale, it is also important to consider item weighting. In this tool as in most of the other problem gambling scales, the items are unweighted. Each is considered to contribute equally to the problem gambling dimension. Dickerson has criticised this aspect of the SOGS, arguing that there is hierarchy of seriousness in the items. To an extent this is an empirical issue that could be readily addressed by conducting analyses such as Guttman scalogram analysis to examine whether there is indeed a hierarchy. We suggest that this would be a useful analysis to conduct of the all of the scales included in the proposed validation community survey study.

The VGS tool purpose

As we have previously discussed, we consider that there are five main purposes to which problem gambling measurement tools can be put. These include:

- A current diagnostic purpose (Who currently has the problem?);
- A current severity classification purpose (How severe is the problem?);
- A predictive diagnostic purpose (Who is at risk of developing the problem in the future?);
- An intervention design purpose (What is needed to treat the problem?);

- A triage or screening purpose to refer the person for further assessment or action (What further assessment or action is required?).

The authors defined the purpose of the VGS as follows:

> *'To develop a new instrument that could be used in surveys of the general population to assess the extent of problem gambling and for people presenting for problem gambling treatment or assistance in a clinical setting ... '* (p.1)

The VCGA proposed that the measurement instrument, provisionally called the VGS should be able to:

- be used in surveys of the general population — i.e. have predictive validity when used as a population screen;
- have versions suitable for various methods of administration including self-administration by telephone interview;
- be administered by Computer Aided Telephone Interview (CATI) in particular in the Authority's continuing survey series of Gambling Patterns and Perceptions;
- be used as a face-to-face intercept interview at gambling venues;
- be used as a face-to-face interview at selected dwellings; and
- be used with people presenting for problem gambling treatment or assistance in a clinical setting (p.9).

Although the term prevalence is mentioned in the Flinders report, there is no explicit discussion of the implications of the kind of prevalence being measured (i.e. point, period or lifetime). As the VGS tool seeks questions concerning the last 12 months it can be considered as a 12-month period prevalence measure.

The following quotation from the report also informs this discussion:

> *'It was always intended that the VGS would be developed on an empirical basis. That is, there would be no pre-conceived assumptions about what constituted harm, how it would best be measured, how it related to phenomena such as the gambling syndrome and how it related to problem gambling. As far as possible the development process would be 'bottom-up', starting with input from all relevant sources and then working towards a measuring instrument. The process had certain limitations that have to be acknowledged at the outset. Importantly, the whole development process was 'cross-sectional' in nature. The development program reported here was intentionally limited to the generation of a valid measure of current problem gamblers. It was only ever intended to quantify past and present harm due to gambling. Resources were not available to follow up respondents over time, so that it was not possible to identify those gambling behaviours at one point in time that would be indicative of the development of harmful consequences at a time in the future. Responses to the VGS could potentially be used to identify gamblers at risk of future harm, but only once the additional relevant studies have been undertaken … '*

We take this discussion to mean that the tool is intended to serve a current diagnostic purpose and also to possibly serve as a current severity classification purpose. The predictive diagnostic purpose is specifically disavowed and the intervention design purpose is not mentioned.

As with the other problem gambling measurement tools, the authors of the VGS take what we consider to be an atheoretical or inductive position with respect to the tool structure and the derivation of items to be included in it. We do not agree that there are 'no pre-conceived assumptions' in the scale. Rather, the model or models used to inform item selection have not been explicitly stated. They have not been systematically derived from a theoretical or conceptual framework concerning the nature and constructs of problem gambling. Rather, an inductive process

of consultations with consumers and experts has been used. We by no means make this observation exclusively concerning the VGS. They are in good company.

For example, the developers of the CPGI provide the following discussion (Ferris and Wynne 2001a):

> *' … in order to produce the most valid and reliable instrument possible for use in general population surveys, we needed to decide what sort of measure we wanted to produce, a prevalence measure or a general screen. In Phase I, we were assuming that the answer was "a general screen". However, as our work evolved, it became clear that what was required was an index that could serve both purposes. This of course is a thorny problem. For prevalence, we needed to be able to relate our findings to the current diagnostic standard, the DSM–IV. For screening, we needed to be able to include a variety of other indicators, and broaden the concept of "at risk" as it is defined by prevalence measures. To measure prevalence, we needed items measuring behaviour and adverse consequences. For screening, we wanted to incorporate items that provided more social context or background information on problem gambling, but couldn't be "scored" per se because they were soft, or indicative, signs of gambling problems rather than hard or diagnostic signs like the behavioural or consequence items … '* (p.3)

This discussion neatly illustrates the dilemmas facing developers of omnibus measurement tools loaded up with divergent purposes and expectations. The discussion includes mention of the difficulties associated with serving both current and predictive diagnostic purposes. However, what predicts future behaviour may only be peripherally associated with current diagnostic considerations.

As a matter of fact, the SOGS developers have probably been the clearest exponents of the use of their tool. The SOGS was designed as a screening tool for clinical populations to assist with decisions to refer for further assessment or treatment. Many of the researchers who then embraced it attempted to apply it for the purpose of a diagnostic tool, which was then used in population studies to measure the prevalence of problem gambling within the target study population. As test developers we have personal experience of the enlargement of functions for a measurement tool designed for a different purpose. In the Work Ability Tables, which were designed to assess whether a person with disabilities could work or not, they are now used to assist with screening for referral to work assistance and training programs. The issue of whether tools can be used for additional purposes is an empirical one in which the issues of reliability, validity, applicability and practicability need to be re-assessed for the new purpose. These properties should not be assumed. In the case of the Work Ability Tables, extensive studies were conducted to evaluate the utility of the tool for the new purpose.

Our general conclusion is that the Flinders work was conducted to a high standard using proven and well-substantiated test development protocols. A more detailed explication of the conceptual and theoretical model informing its content and its specific purpose(s) would have been useful. Further validation of the tool involving a large validation study sample is required in the context of its specific purposes. It has good internal psychometric properties but the validation process requires further work. This is being completed as part of the GRP 2003 community attitudes survey.

Analysis of the problem gambling measurement tools and typologies

Purpose/auspice of the Canadian Problem Gambling Index

In 1997 an inter-provincial group of government agencies with responsibility to mitigate problem gambling commissioned the Canadian Centre on Substance Abuse (CCSA) to conduct a three-year research project to measure problem gambling in Canada. A main outcome of that project is the development of a new measurement instrument, the CPGI (Ferris, Wynne and Single 1999). This instrument was developed to better measure gambling problems in the general population in comparison to the more commonly used SOGS. One of the major criticisms of SOGS has been that it was developed in a clinical setting with 'problem gamblers', yet it is used in general population studies. The instrument also has been widely criticised for containing unproven assumptions about problem gambling (Volberg 2001).

Compared to SOGS, the CPGI is more theory based, designed specifically for community studies and is better able to distinguish between sub-types of problem gamblers in general population surveys.

Development of the CPGI

In the development of the CPGI, Ferris and Wynne retained nine scored items from a variety of sources — SOGS, DSM–IV, expert opinion — that were the strongest predictors of problem gambling (validity) and that showed stability in test/re-test (reliability). The nine items are:

- Chasing losses;
- Escalating bets to maintain excitement;
- Feeling that one might have a problem with gambling;
- Borrowing or selling to get gambling money;
- Betting more than one can afford;
- Feeling guilty about gambling;
- Being criticised by others for gambling behaviour;
- Incurring harm to one's health;
- Having financial difficulties to one's household due to gambling.

These items are scored to construct a Problem Gambling Severity Index (PGSI). Using this index, the CPGI makes a distinction between non-problem gamblers, low risk gamblers, moderate risk gamblers and problem gamblers.

In developing the CPGI, the research team critically analysed existing instruments, and examined the domains and variables that each purported to measure for the purpose of incorporating the best of these into the CPGI's first draft. This draft was scrutinised by an international panel of experts, modified and pilot-tested with three groups (a random sample from the general population, regular gamblers who responded to newspaper ads, and problem gamblers in treatment [N=50 per group]) (Smith and Wynne 2002:10).

Reliability/validity studies

The 31-item CPGI has been shown to have good construct validity and reliability in psychometric testing (Ferris and Wynne 2001a, 2001b). In a national validation study of 3,120 adult Canadians from all provinces the performance of the nine PGSI scored items in discriminating gambler sub-types was superior to either the SOGS or DSM–IV scored items.

To establish reliability, the CPGI was re-administered to a sample of 417 respondents from the initial survey. To further validate the classification accuracy of the CPGI, problem gambling treatment specialists conducted clinical interviews with 143 survey participants.

Thus the CPGI is the first problem gambling behaviour measurement instrument to be rigorously tested prior to its use in population surveys. Moreover, it is the only problem gambling measurement tool to have established and published psychometric properties before its application in gambling research.

Population studies and the CPGI

To date, the CPGI has been used in a Canada-wide gambling survey (Ferris and Wynne 2001b) and in the provinces of Ontario (Wiebe, Single and Falkowski-Ham 2001), Saskatchewan (Wynne 2002) and Alberta (Smith and Wynn 2002). It has also been used in a population survey in Queensland of over 11,000 respondents (Queensland Household Gambling Survey, 2001).

The CPGI is now clearly the measurement instrument of choice in Canada. By 2003, all provinces will have completed general adult population prevalence studies utilising the CPGI. These comparable studies will feed into a national database that profiles gambling and problem gambling behaviour across Canada.

Further proposed Canadian developments from the CPGI include:

- The CCSA plans to develop a Canadian Gambling and Problem Gambling Profile from these provincial data (Smith and Wynne, 2002);
- Statistics Canada has adopted the CPGI in its present omnibus national mental health survey (N=35,000) which is expected to provide rich data to explore mental health and at-risk/problem gambling correlates (Statistics Canada, 2002); and
- The Ontario DATIS system that tracks all clients in alcohol, drug, and problem gambling treatment has mandated that the nine-item PGSI must be administered to all clients entering treatment. This will result in an expanding database that will be available for longitudinal studies (Centre for Addiction and Mental Health, 2002).

Practicability issues and the CPGI

Because the CPGI is a relatively new measure, the results of surveys using this instrument cannot yet be compared directly with prior prevalence studies. However, it is widely acknowledged to provide more meaningful insight into the nature and extent of problem gambling behaviour in the general population than studies that use SOGS.

Common themes and advantages of the CPGI and the VGS are that they both direct attention to associated ‘risk’ behaviours/pathways such as alcohol and drugs. A major value of studies using the CPGI lies in the implications for the targeting and design of interventions to prevent and deal with gambling problems. Canadian studies using the CPGI have found that gambling problems are often complicated by substance abuse. Although problem gamblers are more likely to have higher rates of alcohol and tobacco consumption than other gamblers, and they are more likely to use illicit drugs. These studies have also found a close connection between problem gambling and a family history of alcohol or drug problems.

The finding in studies using the CPGI that gambling problems and substance abuse are closely connected indicates the potential benefit of screening clients in gambling counselling and treatment programs for alcohol and drug problems. Korn and Shaffer's review monographs published in the *Journal of Gambling Studies* and the Annual Review of Public Health provide major reviews of these research findings. The high level of alcohol and substance abuse co-morbidities amongst people with problem gambling is now an accepted finding in this research literature and screening for these problems is, in our view, a necessary and appropriate practice response to this research evidence. Similarly, persons presenting with alcohol and drug problems should be screened for gambling problems.

Another major finding of Canadian studies is that gambling problems are related to poor health, stress and depression. Korn and Shaffer's reviews and also the work of Doiron and Nicki (2001) in the *Canadian Journal of Psychiatry* support this proposition.

The relationship between gambling and health problems highlights the need for prospective studies designed to untangle causal patterns and inform development of targeted prevention strategies and treatment programs.

Application of the CPGI in Ontario and Alberta

Jamie Wiebe, Eric Single and Agata Falkowski-Ham recently completed the analysis of a telephone survey of 5,000 Ontario residents using the CPGI (Wiebe, Single and Falkowski-Ham 2001); and a study of 1,804 adult Albertans was completed in February 2002 (Smith and Wynne 2002).

There is a reasonably good consensus that the CPGI's nine PGSI items are useful and relevant, but there is some disagreement among Canadian and US researchers about the specific details on how to generate the most robust scale using these CPGI items.

While the Ontario researchers agree that the CPGI provides a better measurement tool than SOGS, they argue that the instrument still needs refinement. In particular they argue that there is a need for:

- unbiased, empirically based criteria for weighting the nine PGSI items. They are currently unweighted and the Ontario researchers suggest that some items should carry greater weight;
- unbiased, empirically based criteria for finding the most robust dividing lines for the scaling categories;
- to rename the four categories of the CPGI; and
- to investigate whether there are sub-dimensions to the scale.

In the Ontario report, the authors changed the names of the four categories of gamblers: 'low-risk gambler' was changed to 'at risk gambler' and 'moderate-risk gambler' to 'moderate problem gambler'. The Ontario study also changed the manner in which the 'at risk' group was scored, including some cases that would have been in the non-problem gambling group in the original version of the CPGI. This was based purely on face validity rather than empirical criteria. In the authors' judgement, cases involving people who said 'sometimes' to one or two items and 'never' to the other items seemed to be better categorised as at-risk gamblers. This did not change the basic results of the study in any appreciable manner.

These changes seem to be more driven by a socio-political concern rather than a technical question about the instrument. A representative of the Queensland Gambling Policy Directorate reported that they found the terminology in the Ontario study 'unhelpful'.

In personal correspondence Henry Lesieur (who developed SOGS) also raised questions about items in the PGSI. His criticism does not focus on the CPGI itself, but rather, his focus is on which items are the best predictors of problem gambling. His claim is that two of the SOGS items that are retained in the

nine-item PGSI measure are among the weakest predictors of problem gambling. At time of writing, Lesieur is writing this analysis as an article for submission to Addictions.

The researchers who developed the CPGI have repeatedly stated that it is subject to further refinement and the Canadian Institute on Health Research (CIHR) reportedly is interested in funding a workshop on this issue.

Application of the CPGI in Queensland

A representative of the Gambling Policy Directorate reports that in general they are 'happy with the outcomes' from the CPGI:

> *'It seems to have limited non-disclosure by interviewees and it provides a useful array of information that helps governments to better define the nature of problem gambling behaviours and to design policy responses. Like all survey instruments the very act of measuring influences the outcome and trade-offs between specific information and generalisable information have been and continue to be made … '*

The CPGI screen has been found to be at least as reliable as the SOGS screen and probably more accurate. Anecdotes from the Queensland interview team suggest that interviewees were more likely to answer CPGI questions.

Individual items have been analysed with a 'relatively low level of depth' but the GPD has found that they are congruent with previous research findings and internally consistent. In relation to the validity of the CPGI the key issue is whether it provides valid useable information for understanding the social construction of problem gambling. The Gambling Policy Directorate reports: 'On that basis CPGI has given us good information about the behavioural as well as environmental aspects of both problem and non-problem gamblers. We suspect that the survey has identified some reliable mechanisms which might lead to problem gambling behaviour.'

As the CPGI is a population tool, the GPD argues that the instrument is more likely to be accurate at high sample sizes than lower ones, whereas they suggest that SOGS is 'just broadly inaccurate'. In the opinion of the GPD representative, one key advantage of the CPGI has been to have a statistically reliable way of testing for apparently correlated behaviours.

The CPGI also has been applied in a correctional setting in Queensland and proven to be 'quite robust' in that context as well.

Conclusion on the CPGI

The CPGI's capacity to identify 'at risk' gamblers in the general population has potentially important implications for early interventions aimed at preventing or dealing with gambling problems.

The major findings of prevalence studies in the USA, Canada and Australia using SOGS, CPGI and other prevalence instruments indicate that the prevalence rate is relatively constant/stabilised. Even so, new screening tools are currently being developed and several researchers (e.g. Shaffer and colleagues at the Harvard Medical School, the Queensland GPD, the Productivity Commission) suggest that governments and the public would be better served by switching the research focus to incidence studies, a point taken up in this report later.

The South Oaks Gambling Screen

Since its development (Lesieur & Blume, 1987) the SOGS has been used extensively. Schaffer, Hall & Vander Bilt (1997), for example, in their review of pathological gambling prevalence studies, noted that the SOGS had been used in over half of 152 studies identified, as the measure of pathological gambling.

As it has also been reviewed extensively elsewhere (Dickerson, 1993; Lesieur & Blume, 1993; Lesieur, 1994; Dickerson, McMillen, Hallebone, Volberg & Woolley, 1997; Productivity Commission, 1999; Stinchfield, 2002) we only note here, briefly, some of the main concerns identified in these reviews, with its use as a population prevalence measure of problem or pathological gamblers:

- The SOGS was developed as a clinical tool to identify probable pathological gamblers. It demonstrated good reliability and validity, and not surprisingly, high correlation with DSM–III-R criteria for pathological gambling (r=.94) and was able to accurately classify Gamblers Anonymous members (98.1 per cent), university students (95.3 per cent) and hospital employees (99.3 per cent). Taken out of the clinical context, there is concern that the SOGS may yield a high false positive score in population studies;
- Excessive weight is given to items concerned with borrowing money, with nearly half of the 20 equally weighted items dealing with sources of funding gambling;
- Using a lifetime frame of reference, rather than a past month, past six months or past 12 months for the SOGS items may overestimate current prevalence, as it captures in population surveys, those who may have had a problem with their gambling but now no longer do so;
- The SOGS contains both subjective and behavioural items, in distinction to DSM–IV which is behavioural only, introducing the potential for the relativity involved to inflate numbers of those defined as pathological gamblers, as a score of 5 on SOGS, the cut-off score for defining probable pathological gamblers, if made up of mainly behavioural items, may not reflect 'objectively' pathological gambling;
- In common with other measures of problem gambling, SOGS data are based on self report, which may not be reliable;
- Both SOGS and DSM–IV combine items to do with the characteristics of gambling, such as 'chasing'; and items to do with the consequences of gambling, such as 'missing important social engagements';
- The SOGS may not be sensitive to the social and material contexts of the player, including culturally diverse contexts;
- SOGS may be better used as a screen prior to validation of problem gambling status by application of DSM–IV or clinical interview, as appropriate.

Content analysis of the measurement tools

In analysing the relationship of the VGS to other measurement tools, a thorough content analysis was required. Content analysis shows in a direct rather than statistical manner the association between the content and structure of different measurement tools. It is an essential activity in the development and validation of new measurement tools. The content analysis used the conceptual model described earlier in this document as its basis.

The tools included in the content analysis were:

- The standard SOGS;
- Canadian Problem Gambling Index;
- The Victorian Gambling Screen Content Analysis;
- The DSM–IV diagnostic criteria;
- The GA 20 Questions;
- Life Area Measures.

In order to better understand the ways in which problem gambling is currently measured amongst different measurement tools, we conducted a content analysis of the selected tools using four main content categories:

- Propensity to gamble/attitudes to gambling
- Gambling behaviour and actions
- Consequences of gambling behaviour
- Source of Funding

These categories derive directly from the model of problem gambling components discussed in the previous section of this report. Each of these categories was broken down into a further set of more detailed categories in order to understand the exact content of the tools. The categories used in the content analyses were as follows:

Propensity to Gamble/Attitudes to Gambling	Attitudes to Gambling Attitudes to Problem Gambling Ideation about Gambling
Gambling Behaviour and Actions	Frequency of gambling behaviour Duration of gambling activity Type of gambling activity Gambling Patterns (general) Unsuccessful control Overspending Loss chasing Spend on gambling
Consequences of Gambling Behaviour	Impact on job/employment Impact on housing/living arrangements Impact on financial well-being Borrowing money from others Received criticism about gambling Impact on relationships (general) Impact on relationships – spouse/children Impact on relationships – other family Impact on relationships – friends Impact on relationships – workmates Criminal Behaviour Deceptive Behaviour Gambling related health problems
Funding Source	Source of funding for gambling
Demographic and Other	Age Sex Job Religion Cultural background Income Family Structure/Living arrangements Education Physical health status Mental health status Drug and alcohol use Other

Conducting content analysis of gambling measurement tools

The initial coding scheme was trialled independently by two different raters on the tools chosen for the content analysis. The coding scheme was elaborated based upon discussion of the two raters of the outcomes of the initial coding pass. It was then re-applied independently by the raters to the selected problem gambling measurement tools. Once the independent rating was completed, the results of the

ratings were compared. There was 98 per cent communality over all ratings. Any remaining differences were eliminated following discussion between the raters.

The detailed outcomes of the ratings appear in the following tables. The item numbers from each of the tools that address each of the categories appear in the right most column. The tools appear as appendices to this document. These detailed results tables are followed by a summary table and discussion.

Table 1: Standard SOGS Content Analysis

	Question Category	Item numbers
Propensity to Gamble/Attitudes to Gambling	Attitudes to gambling Attitudes to problem gambling Ideation about gambling	6,9,10
Gambling Behaviour and Actions	Frequency of gambling behaviour Duration of gambling activity Type of gambling activity Gambling patterns (general) Unsuccessful control Overspending Loss chasing Spend on gambling	4 7
Consequences of Gambling Behaviour	Impact on job/employment Impact on housing/living arrangements Impact on financial well-being Borrowing money from others Received criticism about gambling Impact on relationships (general) ▪ spouse/children ▪ other family ▪ friends ▪ Workmates Criminal Behaviour Deceptive Behaviour Gambling related health problems	15 14 8 13 5, 11
Funding Source	Source of funding for gambling	16a),b),c),d), e),f),g),h),i)
Demographic and Other	Age Sex Job Religion Cultural background Income Family structure/living arrangements Education Physical health status Mental health status Drug and alcohol use Other	

Scoring for the SOGS

- On question 4, score 1 point if most of the time or every time I lost.
- On question 5 score 1 point if less than half the time I lost or yes, most of the time.
- On question 6, score 1 point if yes, in the past, but not now or yes.
- Ignore questions 1,2,3 and 12.
- On all remaining questions score 1 point if a yes.

A score of 3 or 4 points suggests a potential pathological (problem) gambler, a score of 5 points or more suggests a person is 'probable pathological gambler' using the US nomenclature, and a problem gambler in Australia.

Source: Lesieur and Blume (1987, p. 1188).

Table 2: Canadian Problem Gambling Index Content Analysis

	Question Category	Item numbers
Propensity to Gamble/ Attitudes to Gambling	Attitudes to gambling	9, 13, 16
	Attitudes to problem gambling	17, 16
	Ideation about gambling	
Gambling Behaviour and Actions	Frequency of gambling behaviour	
	Duration of gambling activity	
	Type of gambling activity	
	Gambling patterns (general)	
	Unsuccessful control	
	Overspending	15
	Loss chasing	
	Spend on gambling	
Consequences of Gambling Behaviour	Impact on job/employment	
	Impact on housing/living arrangements	
	Impact on financial well-being	12
	Borrowing money from others	
	Received criticism about gambling	11
	Impact on relationships (general)	
	▪ spouse/children	
	▪ other family	
	▪ friends	
	▪ workmates	
	Criminal behaviour	
	Deceptive behaviour	14
	Gambling related health problems	10
Funding Source	Source of funding for gambling	
Demographic and Other	Age	
	Sex	
	Job	
	Religion	
	Cultural background	
	Income	
	Family structure/living arrangements	
	Education	
	Physical health status	
	Mental health status	
	Drug and alcohol use	
	Other	

Scoring for the Canadian Problem Gambling Index

Low Risk, High Risk and Problem Gamblers are defined using the following scores for each of the responses to Q9 to Q17:

Never=0 Rarely=1 Sometimes=1 Often=2 Always=3 Don't know/can't remember=0 Refused=0

If the total score for Q9 to Q17 is between 0–5, then this is a low-risk gambler.

If the total score for Q9 to Q17 is either 6–7, then this is a high-risk gambler.

If the total score for Q9 to Q17 is between 8–27, then this is a problem gambler.

Table 3: The Victorian Gambling Screen Content Analysis

	Question Category	Item numbers
Propensity to Gamble/ Attitudes to Gambling	Attitudes to gambling	1, 2
	Attitudes to problem gambling	4, 11, 12
	Ideation about gambling	3, 6, 8, 9, 10
Gambling Behaviour and Actions	Frequency of gambling behaviour	
	Duration of gambling activity	
	Type of gambling activity	
	Gambling patterns (general)	
	Unsuccessful control	5
	Overspending	19
	Loss chasing	7
	Spend on gambling	
Consequences of Gambling Behaviour	Impact on job/employment	
	Impact on housing/living arrangements	
	Impact on financial well-being	20
	Borrowing money from others	21
	Received criticism about gambling	13, 17a),b)
	Impact on relationships (general)	
	▪ spouse/children	16a),b), 18a), b)
	▪ other family	
	▪ friends	
	▪ workmates	
	Criminal behaviour	
	Deceptive behaviour	14, 15
	Gambling related health problems	
Funding Source	Source of funding for gambling	
Demographic and Other	Age	
	Sex	
	Job	
	Religion	
	Cultural background	
	Income	
	Family structure/living arrangements	
	Education	
	Physical health status	
	Mental health status	
	Drug and alcohol use	
	Other	

Scoring the VGS

Enjoyment of Gambling Scale

This is created from Questions 1, 2 and 3. If any of these is scored 8, 9 or is blank, then the Enjoyment of Gambling score cannot be calculated, and should be treated as missing. Otherwise, sum the responses of Questions 1, 2 and 3 to obtain a score ranging from 0 (No enjoyment) to 12 (Great enjoyment).

Harm to Partner Scale

This is created from Questions 16, 17 and 18. If Question 16a, 17a or 18a is scored 9 or is blank, or Question 16b, 17b or 18b is scored 9 or blank, then the Harm to Partner cannot be calculated, and should be treated as missing.

Recode Question 16b, 17b and 18b from 1=Yes, 2=Maybe, 3=No to 0=No, 1=Maybe, 2=Yes, so as to keep the direction of responses consistent with the other scales. The scores for the three harm to partner variables are then summed to provide an overall score ranging from 0 (No harm to partner) to 6 (High harm to partner).

Harm to Self Scale

The remaining 15 variables form the Harm to Self Scale, namely, Questions 4, 5, 6, 7, 8, 9, 10,11, 12, 13, 14, 15, 19, 20 and 21. If any of these questions is scored 8, 9 or is blank, then the item should be considered to be missing. If four or more or of the 15 items making up this scale are missing then the scale cannot be computed, and the Harm to Self Scale should be treated as missing. If up to three items are missing then their values may be imputed

The Harm to Self Scale is then created by summing the 15 items to create a score from 0 (No harm to self) to 60 (High harm to self).

The Harm to Self scale is used to identify problem gamblers in the following way:

0–8 normal; 9–13 Borderline problem gamblers; 14–20 Pathological gambler; 21+ Problem gambler.

Table 4: DSM–IV Content Analysis

	Question Category	Item numbers
Propensity to Gamble/ Attitudes to Gambling	Attitudes to gambling	
	Attitudes to problem gambling	
	Ideation about gambling	1, 5
Gambling Behaviour and Actions	Frequency of gambling behaviour	
	Duration of gambling activity	
	Type of gambling activity	
	Gambling patterns (general)	2
	Unsuccessful control	3, 4
	Overspending	
	Loss chasing	6
	Spend on gambling	
Consequences of Gambling Behaviour	Impact on job/employment	9
	Impact on housing/living arrangements	
	Impact on financial well-being	
	Borrowing money from others	10
	Received criticism about gambling	
	Impact on relationships (general)	9
	▪ spouse/children	
	▪ other family	
	▪ friends	
	▪ workmates	
	Criminal behaviour	8
	Deceptive behaviour	7
	Gambling related health problems	
Funding Source	Source of funding for gambling	
Demographic and Other	Age	
	Sex	
	Job	
	Religion	
	Cultural background	
	Income	
	Family Structure/Living arrangements	
	Education	
	Physical health status	
	Mental health status	
	Drug and alcohol use	
	Other	

Scoring for the DSM–IV

All items are scored 1 for Yes, 0 for No. A sum of five or more indicates persistent and recurrent maladaptive gambling behaviour.

Table 5: The GA 20 Questions Content Analysis

	Question Category	Item numbers
Propensity to Gamble/Attitudes to Gambling	Attitudes to gambling	
	Attitudes to problem Gambling	3
	Ideation about gambling	5, 8, 14, 18, 19
Gambling Behaviour and Actions	Frequency of gambling behaviour	
	Duration of gambling activity	15
	Type of gambling activity	
	Gambling patterns (general)	
	Unsuccessful control	
	Overspending	9
	Loss chasing	7
	Spend on gambling	
Consequences of Gambling Behaviour	Impact on job/employment	6
	Impact on housing/living arrangements	
	Impact on financial well-being	
	Borrowing money from others	10
	Received criticism about gambling	
	Impact on relationships (general)	1, 2
	▪ spouse/children	13
	▪ other family	
	▪ friends	
	▪ workmates	
	Criminal behaviour	16
	Deceptive behaviour	
	Gambling related health problems	4, 17, 20
Funding Source	Source of funding for gambling	11, 12
Demographic and Other	Age	
	Sex	
	Job	
	Religion	
	Cultural background	
	Income	
	Family structure/living arrangements	
	Education	
	Physical health status	
	Mental health status	
	Drug and alcohol use	
	Other	

Scoring the GA 20

All items are scored 1 for Yes 0 for No. A sum of seven or more indicates a problem gambler.

Table 6: Life Areas Measure Content Analysis

	Question Category	Item numbers
Propensity to Gamble/Attitudes to Gambling	Attitudes to gambling	
	Attitudes to problem Gambling	
	Ideation about gambling	
Gambling Behaviour and Actions	Frequency of gambling behaviour	
	Duration of gambling activity	
	Type of gambling activity	
	Gambling patterns (general)	
	Unsuccessful control	
	Overspending	
	Loss chasing	
	Spend on gambling	
Consequences of Gambling Behaviour	Impact on job/employment	4
	Impact on housing/living arrangements	
	Impact on financial well-being	5
	Borrowing money from others	
	Received criticism about gambling	
	Impact on relationships (general)	1
	▪ spouse/children	3
	▪ other family	
	▪ friends	
	▪ workmates	
	Criminal behaviour	
	Deceptive behaviour	
	Gambling related health problems	2
Funding Source	Source of funding for gambling	
Demographic and Other	Age	
	Sex	
	Job	
	Religion	
	Cultural background	
	Income	
	Family structure/living arrangements	
	Education	
	Physical health status	
	Mental health status	
	Drug and alcohol use	
	Other	

Scoring for the Life Areas Measure

The number of 'yes' responses are summed, those with two or more are considered problem gamblers.

Summary of content analyses for all problem gambling measurement tools

Table 7 below provides a summary of the outcomes of the content analyses for all of the relevant measures. There is obviously a wide divergence in the number of items in each of the tools. Some of the tools include demography and other questions as part of the overall tool, others do not.

Table 7: Summary table of content analyses for all problem gambling measurement tools

Tool	Attitudes	Behaviour	Consequences	Funding Source	Total (scored items)
SOGS	3 (15%)	2 (10%)	6 (30%)	9 (45%)	20
CPGI	2 (22%)	3 (33%)	4 (44%)	0 (0%)	9
VGS	10 (41.6%)	3 (12.5%)	11 (45.8%)	0 (0%)	24
DSM–IV	2 (20%)	4 (40%)	4 (40%)	0 (0%)	10
GA 20	6 (30%)	3 (15%)	9 (45%)	2 (10%)	20
Life Areas Measures	0 (0%)	0 (0%)	5 (100%)	0 (0%)	5

For ease of presentation this data is summarised in Figures 1 and 2 that follow.

Figure 1: Summary graph of content analyses for all problem gambling measurement tools broken down by instrument

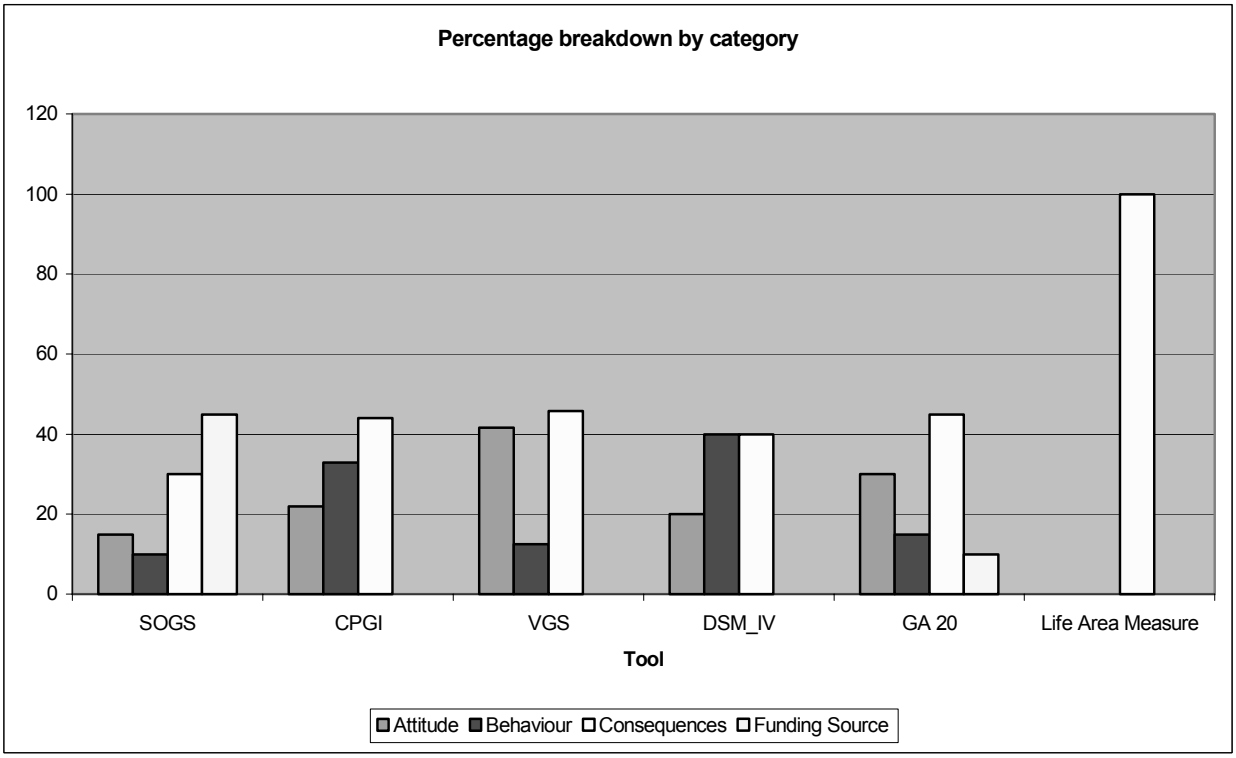
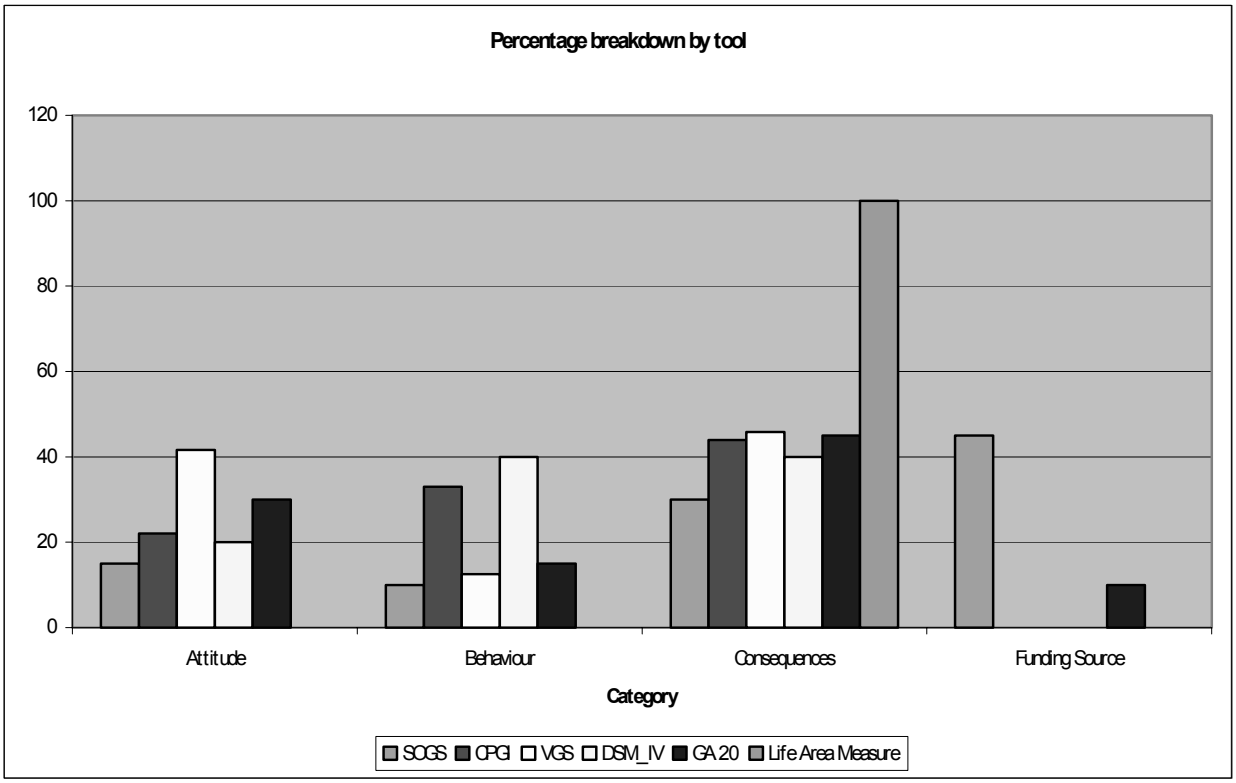


Figure 2: Summary graph of content analyses for all problem gambling measurement tools broken down by category



From the content analysis it is evident that the SOGS has a relative emphasis on both the consequences of problem gambling and source of funding. Whereas the VGS tool, has a relative emphasis on both the consequences and attitudes towards gambling. The CPGI and DSM–IV both have a relative emphasis on the actual gambling behaviour and its consequences. The Life Areas Measure places total reliance on consequences. Overall consequences of gambling rather than the actual gambling behaviour or attitudes to gambling are relatively emphasised in all the tools as a group.

We, once again, refer to Blaszczynski's definition of problem gambling as one of the few to include explicit mention of both an underlying condition as well as its symptoms and consequences. We support this conceptualisation and its reflection in the tools designed to measure problem gambling. The Canadian Index most closely approximates this goal. The CPGI includes a preponderance of scored items in all of the domains suggested by Blaszczynski's definition. The SOGS, being a clinical screening tool, albeit very widely used and studied, does not. The VGS has an intermediate position.

The analyses also indicate very widely differing emphases in the conceptualisation of what problem gambling is and how it should be measured. Such variation makes the adoption of standard measures even if they are flawed more attractive as the comparison of apples and oranges measured using imperial and metric scales makes it very difficult to derive adequate benchmark data in order to understand impacts and plan services.

What value does the VGS add over the other tools?

One of this project's goals is to:

> *'Assess the extent to which there are unique features related to problem gambling in Australia and the extent to which these are/could be adequately catered for in the VGS or a modified form of the VGS.'*

This is a challenging question that can be addressed using several different methodologies. One approach is to, as has been done in the present study, examine the content of the VGS and compare it with the other problem gambling measurement tools. On the basis of this content analysis, it would not seem to have particularly unique content attributes when compared with the CPGI.

However, a content analysis alone does not reveal the empirical and statistical relationship of the measurements obtained from the VGS with the results of the other tools. If one takes the reference to 'unique' as referring to unique variance in a statistical sense then the only way to assess this is to run a concurrent validation trial where all of the tools are contemporaneously administered to the same sample of respondents and to then examine the statistical inter-relationships between the measurements yielded by the respective tools. The Flinders study performed a small such validation study but the numbers involved were modest. In addition other validation measures including spend/income could and should be correlated with the test results.

In sum our assessment of the content of the VGS does not reveal particularly unique features related to problem gambling in Australia but a content analysis alone is not a definitive way of determining this issue. A proper validation study as is currently being conducted for Study 1b of the current GRP research program and is required to answer this question combined with appropriate analyses. The proposed design of this study is specified later in this document.

The design of the forthcoming validation study

An important aspect of the present work is to perform the following tasks:

- Deliver a research design for a large scale (a) Victorian and (b) National validation survey that would have the dual purpose of validating the VGS and obtaining some useful information on characteristics of problem and potential problem gamblers; and
- Include in the research design details of appropriate survey questions, sampling, telephone survey and other techniques of data collection, as appropriate, to chosen sub populations that will cross validate the VGS with other instruments, and that will allow comparisons of a Victorian population study with other relevant, recent research in other states;
- Include consideration of:
  - Confidentiality and anonymity issues;
  - Recruitment methodologies with respect to sample bias;
  - Issues in reaching all study segments and sub-populations especially for groups from CALD backgrounds and those who may wish to 'hide' their gambling activities;
  - Response bias and validity;
  - The virtues and problems of different survey response methods;
  - How to compare VGS results with the results of other tools.

We will use each of the task elements as headings.

Details of appropriate survey questions

We consider that the VGS and the CPGI should be used in the validation study. While the SOGS is widely used in problem gambling research, at some point the initial specifications of the test designers need to be followed, i.e. the SOGS is intended as a screening tool for clinical populations, not as a community problem gambling prevalence measurement tool. If the purpose is to measure community prevalence, then there is not a strong rationale for inclusion of the SOGS in a community survey. However in the initial study we recommend the inclusion of the SOGS in order to enable an analysis of the comparability of cut-off scores. It is so widely used internationally that we need the data from it to set appropriate cut-off scores for the other tool or tools.

Sampling details

The validation study should involve a large-scale community survey of Victorian respondents.

One of the problems associated with general surveys of the community is that they frequently provide under-representation of hard to reach and socially marginalised groups. In the Australian and the present study context, this means that typically, people from culturally and linguistically diverse backgrounds tend to be under-represented in study samples.

We know from the VCGA funded research conducted by Thomas and Yamine (2000) that rates of problem gambling in specific cultural groups within Australia are much higher than in the general community. For Arabic, Greek, Chinese and Vietnamese speaking groups the rates were found to be in the order of five times that of the general community. We also know from other work that rates of

problem gambling in indigenous Australians appears to be higher than for the general community and that traditionally, participation rates of such groups in studies is lower. Under-representation of these groups in study samples has two effects. The first effect is to reduce the apparent rates of problem gambling. The second effect is to reduce the 'voice' of such respondents in the study outcomes, thus biasing study outcomes. Neither effect is desirable. Hence we advocate particular attention to the recruitment of participants from these groups.

We propose that the main body of participants be selected using standard CATI procedures. This will yield an acceptable representation of the general Victorian community.

We also advocate that quotas be established for selected cultural groups including at least Arabic, Chinese, Vietnamese and Greek speaking groups and perhaps others and that these groups be recruited into the study using the Thomas and Yamine VCGA study method. This method is essentially a stratified random sampling method. When lists of the most prevalent language/culture specific names within Australia are combined with the electronic white pages it is possible to randomly select people from the targeted cultural groups. The respondents are contacted 'in language' by trained multilingual interviewers and the option of own language interviews is offered to all participants. We propose CATI for the interviews, for the following reasons. Over-sampling of these groups should be considered.

The paramount consideration in the design of the methodological approach to this project is to ensure that both sample and response bias are minimised. The use of multilingual interviewers with the prospective sample respondents from CALD backgrounds also minimises sample bias through low rates of dropout from the sample.

We propose that the response rates for Koori respondents be monitored within the framework of the overall larger community study and that quotas be established to reflect population proportions for this group within the overall study sample. Over-sampling may also be used if the study of this group is a priority.

If over-sampling of the high prevalence groups is used as described then the ability to find such respondents will be considerably enhanced. Nevertheless finding of a relatively low prevalence group within a larger sample requires a decent size sample. We suggest that a cascading model of random sample selection be included so as to adequately reflect the rates of different levels of participation in gambling in the community within the study sample. A study of at least 7,000 participants at varying levels of gambling participation would provide a robust validation of the tools.

Telephone versus other survey methods

There is now a growing literature about the relative merits of telephone versus face-to-face interviewing. It used to be the conventional wisdom that face-to-face interviews were a somehow better method of gathering data and that telephone interviewing was seen as a cheap but somehow inferior approach. This is no longer the conventional wisdom. There is growing evidence that, rather than disclosure being better within a face-to-face interview, the relative anonymity of a telephone interview may lead to greater disclosure of activities such as gambling and illegal acts. A recent somewhat celebrated example of this situation occurred when the Australian Bureau of Statistics changed over from face-to-face interviews to telephone interviews in its labour force participation studies in 1996. There was a widely reported 'statistical' blip, where the apparent unemployment rate suddenly increased. It was assumed that the sudden increase was in part associated with a greater propensity for respondents to declare that they were unemployed. Apparently, disclosure of unemployment in a face-to-face interview was more embarrassing to some participants.

We advocate telephone interviewing using CATI methods in population studies of problem gambling. This method is economical and likely to result in more valid responses than face-to-face interviewing methods.

Confidentiality and anonymity issues

Standard ethical procedures need to be in operation to address this issue. That is, the information needs to be stored separately from identifying information via a key system and once the study is completed the key should be destroyed. Most university and market researchers are very conscious of the ethical and privacy requirements of them and we do not see any special issues in this context over and above the requirement for rigorous protection of participant privacy. The 'outing' of the status of participants in problem gambling studies is likely to have similar effects to the 'outing' of confidential information concerning users of health and community services for which there are already well developed preventive protocols.

Issues in reaching all study segments and sub-populations especially for groups from CALD backgrounds and those who may wish to 'hide' their gambling activities

It is essential that a population survey methodology in the area of gambling behaviour delivers a sample that is inclusive of all key groups within the community. The work by Thomas and Yamine (2000) in which it has been demonstrated that specific CALD groups have different gambling patterns that the rest of the community underlines the point that inclusion of such groups is essential so as to achieve a statistically unbiased view of the distribution of problem gambling behaviour.

As far as 'hiding' gambling activities is concerned, Walker has discussed the issue of the potential unreliability of self-report data in gambling. Self-report data are used widely in clinical and social research, so the applicability of issues concerning self report data quality are not confined to gambling research. In the gambling domain, there is the additional element that problem gambling is a social construct. There is no gold standard measure of it. However, this does not mean that it is not important to measure, just as concepts such as disability; well-being and mental health are essential constructs in understanding and ameliorating the human condition.

We do not see any practical alternative to self-report data in this context and as self-report measures are used almost universally in related fields, we do not see this as an important issue. However, for accurate estimates of gambling activity, a diary method of data collection may result in more valid data. This is now a widely used method of data collection in health research where there is doubt about the capacity of the respondent to provide accurate answers about their use of services. This incapacity may stem not from a wish to conceal the extent of certain behaviours but an inability to recall them. However in the realm of population studies of the prevalence of problem gambling activity, the diary method is too expensive to implement in most instances.

Some survey questions used in problem gambling studies are difficult for respondents to answer, not because they are concealing their activities but because they require information that they do not readily have. The amount of gambling expenditure, even for a single session, requires quite good record keeping. Over multiple sessions, the difficulties multiply.

Of course the data collection methodology must make provision to preserve and respect the privacy of respondents so that they can reschedule the interview to a time where they are not answering the questions, for example, in front of family or work mates.

Response bias and validity

The issue of response bias is best addressed through rigorous analysis of survey data and rigorous survey methodology.

As far as validity is concerned, in the absence of the ability to observe the actual behaviour of respondents over an extended period, the best method of validation available to us is concurrent validation. That is, several tools purporting to measure the same thing, in this instance problem gambling, are administered to the same participants and the results of each test is then compared with the other. In smaller sample studies, the scores from such tools may be compared with the results of the application of more valid but expensive techniques such as diary methods for validation purposes. These methods of validation are not practicable in large population studies as they are too expensive to implement in large samples. However such methods could be readily applied to a small sub sample of respondents in a larger population study.

The virtues and problems of different survey response methods

The response scales specified in the CPGI and VGS should be used as their designers intended as these are bound up with their measured reliability and validity. It is important that standardised response methods are used in population studies as variations may impact upon the obtained results and introduce response bias. (See the discussion of De Vellis' protocol earlier in this report for a discussion of response methods).

If one interprets 'response methods' as being the method of administration then we advocate telephone administration methods for population surveys and diary methods for smaller studies where response accuracy is paramount and the resources are available to implement these methods.

How to compare VGS results with the results of other tools?

We suggest the following analysis protocols for the validation study. The Flinders study protocols for scale comparison are a good model.

The survey data ought be subjected to a series of psychometric analyses in order to explore the internal structure of the measurement tools and the patterns of inter-relationships with the other tools. The analyses to be conducted should include:

Item difficulty analyses

The patterns of responses to all items ought be investigated with a view to identifying high and low difficulty items. Test discrimination performance is improved by a more equal distribution of responses over the response categories rather than highly skewed distributions. All items in all tools ought be examined for these patterns.

Item scale correlations

All items ought be correlated with their respective scale and sub-scale totals to examine the contribution of all items to scale variance. Low contribution is considered to be psychometrically undesirable.

Coefficient alpha

Alpha ought be calculated for all scales and sub-scales in order to examine the dimensional structure of the items. High alpha indicates a high degree of communality between like items, a psychometrically desirable phenomenon.

Criterion related validity correlations

Each scale ought be correlated with each other to examine the patterns of associations between them. Other key criterion variables ought be entered into these analyses as a validation check; e.g. ever having sought assistance for gambling problems.

Factor analysis

Factor analysis ought be conducted for all tools to examine the internal structure of each. It is also possible that some cross tool analyses ought be conducted using this technique.

Cluster analysis

Cluster analysis ought be used to examine whether there are identifiable clusters or groups of respondents with similar characteristics that are identifiable from common patterns of responses to the measurement tools; e.g. problem gamblers, attendees at problem gambling services, non gamblers and so on. The use of cluster analysis is a vital tool to examine the validity of typologies such as those proposed by the CPGI.

Guttman Scalogram analysis

We advocate the conduct of a Guttman Scalogram analysis to investigate item hierarchies.

Modelling of tool discrimination and scoring thresholds

The implications of setting different scoring thresholds for all tools ought be thoroughly examined using the study data. We suggest examination of the following approaches to setting cut-offs using the collected data:

- Relative frequency approach.
- Absolute value criterion approach.
- Expert judgment approach
- Frequency distribution shape approach

Relative frequency approach to determining cut-off scores

In this approach, the researcher examines the frequency distributions of the obtained scores and determines, on the basis of the distribution a cut-off score. For example, it may be decided that the top five per cent of scores are to be considered as problematic. Thus without reference to the external 'meaning' of the score per se, the researcher sets this as a criterion. This approach is used very widely in health settings where the 95 per cent confidence intervals for measured physical parameters are used as the standard for 'normality'. Scores that fall outside these limits are considered to be atypical and perhaps indicative of an underlying abnormality or problem. In the case of problem gambling such an approach may be used to argue that if 10 per cent of the population are categorised as 'abnormal' then the criterion or cut-off point is too lax. Standardisation where the meaning of a score is determined by reference to its position within the population distribution is a very widely used method.

Absolute value criterion approach to determining cut-off scores

This approach ascribes a specific independent meaning to particular scores. For example, it may be decided that a score of 50 per cent represents a 'pass' on a clinical skills test where if the respondent (student) were unable to achieve this result then they would be considered an unsafe practitioner. In a service standards assessment it may be considered that a score of four on a five-point scale is the minimum 'pass' standard for satisfactory service. In social and health research, there are relatively few measurement scales where absolute values can be applied. In problem gambling, since the definition of 'problem' is a social construct, this method is unlikely to be applicable.

Expert judgment approach to determining cut-off scores

In this approach, experts interpret the profiles of responses and arrive at a judgment of at what level a 'problem' is considered to exist. This method was employed in the Flinders validation study where experts examined cases and related the responses on the VGS to this examination. This is an expensive and infrequently used procedure. However it is a robust one. Given that construction of the problem gambling definition is a social one, it may as well involve a panel of experts.

Frequency distribution shape approach to determining cut-off scores

In this approach, as with the relative frequency approach, the researcher examines the frequency distributions of the obtained scores and determines, on the basis of the distribution a cut-off score. However, this is not determined by a criterion such as the top 5 per cent but by the identification of say a small tail or 'blip' that is demonstrably different from the rest of the respondents. In some instances such a group may not exist. This method has been frequently used to determine mark ranges in education settings; e.g. where should the first-class honours cut-off be set? It is an opportunistic method that is particularly susceptible to random variations from sample to sample.

At the end of the day, each of the above methods of cut-off score determination requires detailed psychometric examination of the scores from a large sample of respondents. The GRP Study 1b will provide this sample. The analyses will provide a comprehensive operational and measurement quality overview of the performance of the tools and their validity and utility for surveying the Victorian community.

The issue of a national survey of problem gambling

The project brief species that we are comment on the design of a national survey of problem gambling. In this discussion reference must first be made to the Productivity Commission survey (Productivity Commission, 1999) which was a major national study of problem gambling. This study remains the only truly national sample survey of gambling activity and problem gambling in Australia. However it is now four-years old.

The design parameters for a national study are essentially the same as a Victorian study. The sampling outcome requirements, in terms of the necessity to validly represent the key population characteristics and groups are the same. That is, there must be adequate representation of at least the following characteristics within the study sample:

- Age groups;
- Sex of respondent;
- Specific cultural groups;
- People with varying participation rates in gambling;
- People with and without problem gambling issues;
- Urban, rural and remote locations.

The methods required to achieve a valid sample are the same as those that have been described for a Victorian survey. Access to the survey must be promoted for all groups within the community through the use of skilled interviewers and targeted recruitment strategies that are designed to ensure the desired sampling outcomes. These strategies are discussed in detail elsewhere and it is not proposed to repeat the discussion here.

In terms of the numbers of respondents required for a national sample survey, the selection of sample size rests squarely upon the foundation of what comparisons are to be made and the analyses to be conducted. If it is desired, for example, to compare the characteristics of relatively rare groups such as problem gamblers or problem gamblers with particular social characteristics

across the jurisdictions then the numbers required for recruitment into the study sample will be very high compared to if comparisons across jurisdictions for these groups were not required. The specification of sample size and quotas is a technical matter that cannot proceed without detailed specification of the study purposes and the desired group comparisons. If there is not a requirement for detailed comparisons across groups by jurisdictions then the sampling specification would broadly equate to the state study but spread across the nation. This would have significant cost advantages but there would be a loss of statistical precision at the state level. The following table provides some illustration of the relationship between sample size and sampling error. The prevalence of the target variable impacts upon the study sample size.

Required sample sizes at the 95 per cent confidence level to yield a given level of sampling error (standard error of proportion), assuming a proportion of prevalence in the population of 0.5

	Required Final Sample Size for an Error of:		
Population Size	**+or- 3%**	**+or- 5%**	**+or- 10%**
50	48	45	33
100	92	80	49
250	203	152	70
500	341	217	81
750	441	254	85
1,000	516	278	88
2,500	748	333	93
5,000	880	357	94
10,000	964	370	95
25,000	1,023	378	96
50,000	1,045	381	96
100,000	1,056	383	96
1,000,000	1,066	384	96
Infinitely large	1,067	385	96

Source: Machin, D, Campbell, M., Fayers, P. & Pinol, A. (1997). Sample size studies for clinical studies (2nd edn.). Oxford: Blackwell Science.

If one targets problem gamblers as the desired target population, as with any relatively rare group, this significantly escalates the study sample size required to recruit them.

Conclusions and recommendations

This study has conducted a comprehensive review of the measurement tools available to assist the GRP in its objective to study gambling activities and outcomes within the Victorian community. The purpose of the study has been to advise the Panel as to which tools it should select for inclusion in its subsequent studies. This is an important decision as it is not obvious from the research literature and international practice what should be done in Victoria. The decision may have important impacts upon the community's and Government's understanding of the scope of and appropriate responses to problem gambling within the Victorian community.

A theoretical and content framework has been developed and used as the basis for the evaluation of the tools. However, because of the differences in emphasis of the various tools and their different cut-off points and scoring methods, the selection of the most appropriate tool for studies of gambling behaviour within the Victorian community requires data that is not available to us from any of the studies conducted to date. In other words we do not have the data we need to make an informed choice between the remaining candidates.

In order to select the most suitable gambling measurement tool for subsequent community studies, a major validation study involving the CPGI, the VGS and the SOGS is underway. The CPGI and VGS most closely reflect the aims of the Panel's community studies while the SOGS is a standard international tool and must be included for comparability with international studies. The GRP Community Attitudes Survey compares the performance of these tools in a large-scale survey of the Victorian community. The validation study is needed to determine the best tool for future studies.

The proposed survey design specified in this report will ensure that:

- sufficient numbers of people at different levels of gambling activity are included, as a validation study must show that the tools work well across the full range of gambling participation levels and outcomes, not just for problem gamblers.
- key groups including men, women, people from metropolitan, rural and regional settings and varied cultural backgrounds are included in sufficient number in the study.

The forthcoming community survey and validation study will prove an important step in the goal of the Panel to effectively monitor rates of problem gambling, participation in gambling and the impacts of gambling in the Victorian Community.

Policy implications of this study

At first glance, the detailed technical advice concerning the measurement of problem gambling offered within the present report may seem to be distant from direct policy considerations. This is far from the case. The development of credible and accurate measures of problem gambling combined with detailed studies of the distribution of gambling and problem gambling activities within the Victorian and Australian communities have very important policy implications.

The development of credible measures to inform such research fits squarely within the requirements of government for evidence based policy and practice. Government in Australia and in international jurisdictions now requires credible research and data upon which to base its policy. In gambling policy the development of credible measures of problem gambling are the linchpin of future research and policy. The numbers and distribution of problem gamblers within the community have important implications for the design and delivery of services targeted at problem gamblers. Who and where such people are located have a pivotal impact upon service design and funding. Clearly, we need to deliver services where they are needed. However the implications are broader than merely counting existing numbers in order to target service design and delivery, important as this may be.

When we have credible measures of problem gambling, we are then in a position to conduct studies that may variously predict the occurrence of problem gambling (and hence enable the development of evidence based preventive strategies) and that enable us to adequately evaluate the impact of other measures that may be taken by government upon the prevalence of problem gambling (to examine whether the interventions and measures taken by government have the desired effects). Thus the development of problem gambling measures is far from just a technical exercise.

The validation study specified in this report will deliver a credible, reliable, valid and practical set of measurement tools that will best meet the needs of the Victorian government and people. It is important that we have the tools so that we can scope gambling problems within the Victorian community and deal with them in the most effective and efficient manner using a sound evidence base.

We urgently need a commitment to regular benchmarking and outcomes study to track the distribution and impacts of problem gambling and gambling activity within the Victorian community. The proposed community survey and associated validation study are the first moves in the initiation and continuation of such activities.

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Appendices

Appendix 1

South Oaks Gambling Screen

1. Indicate which of the following types of gambling you have done in your lifetime. For each type, mark one answer: "not at all," "less than once a week," or "once a week or more."
   a. played cards for money
   b. bet on horses, dogs or other animals (in off-track betting, at the track or with a bookie)
   c. bet on sports (parley cards, with a bookie,, or at jai alai)
   d. played dice games (including craps, over and under, or other dice games) for money
   e. went to casino (legal or otherwise)
   f. played the numbers or bet on lotteries
   g. played bingo
   h. played the stock and/or commodities market
   i. played slot machines, poker machines or other gambling machines
   j. bowled, shot pool, played golf or played some other game of skill for money
2. What is the largest amount of money you have ever gambled with any one day?
   ___ never have gambled
   ___ more than $100 up to $1000
   ___ $10 or less
   ___ more than $1000 up to $10,000
   ___ more than $10 up to $100
   ___ more than $10,000
3. Do (did) your parents have a gambling problem?
   ___ both my father and mother gamble (or gambled) too much
   ___ my father gambles (or gambled) too much
   ___ my mother gambles (or gambled) too much
   ___ neither gambles (or gambled) too much
4. When you gamble, how often do you go back another day to win back money you lost?
   ___ never
   ___ some of the time (less than half the time) I lost
   ___ most of the time I lost
   ___ every time I lost
5. Have you ever claimed to be winning money gambling but weren't really? In fact, you lost?
   ___ never (or never gamble)
   ___ yes, less than half the time I lost
   ___ yes, most of the time
6. Do you feel you have ever had a problem with gambling?
   ___ no
   ___ yes, in the past, but not now
   ___ yes
7. Did you ever gamble more than you intended?
8. Have people criticized your gambling?
9. Have you ever felt guilty about the way you gamble or what happens when you gamble?
10. Have you ever felt like you would like to stop gambling but didn't think you could?
11. Have you ever hidden betting slips, lottery tickets, gambling money, or other signs of gambling from your spouse, children, or other important people in you life?
12. Have you ever argued with people you like over how you handle money?
13. (If you answered "yes" to question 12): Have money arguments ever centered on your gambling?
14. Have you ever borrowed from someone and not paid them back as a result of your gambling?
15. Have you ever lost time from work (or school) due to gambling?

16. If you borrowed money to gamble or to pay gambling debts, where did you borrow from?
(Check "yes" or "no" for each)

a. from household money
b. from your spouse
c. from other relatives or in-laws
d. from banks, loan companies or credit unions
e. from credit cards
f. from loan sharks (Shylocks)
g. your cashed in stocks, bonds or other securities
h. you sold personal or family property
i. you borrowed on your checking account (passed bad checks)
j. you have (had) a credit line with a bookie
k. you have (had) a credit line with a casino

Scoring protocol
Scores are determined by adding up the number of questions that show an "at risk" response, indicated as follows.

Questions 1-3 are not counted.
Question 4: most of the time I lost, or every time I lost = 1 point
Question 5: yes, less than half the time I lose, or yes, most of the time = 1 point
Question 6: yes, in the past, but not now, or yes = 1 point
Question 7: yes = 1 point
Question 8: yes = 1 point
Question 9: yes = 1 point
Question 10: yes = 1 point
Question 11: yes = 1 point
Question 12 is not counted
Question 13: yes = 1 point
Question 14: yes = 1 point
Question 15: yes = 1 point
Question 16a: yes = 1 point
Question 16b: yes = 1 point
Question 16c: yes = 1 point
Question 16d: yes = 1 point
Question 16e: yes = 1 point
Question 16f: yes = 1 point
Question 16g: yes = 1 point
Question 16h: yes = 1 point
Question 16i: yes = 1 point
Questions 16j and 16k are not counted
Total = (20 questions are counted)
Score interpretation
0–3 normal range
3 –4 = potential pathological gambler (problem gambler)
5+ = probable pathological gambler

Appendix 2

Canadian Problem Gambling Index Version 1.0 — January 2001

Section 1 — Gambling Involvement

First, we'd like to ask some questions about activities you may participate in.

People bet money and gamble on many different things including buying lottery tickets, playing bingo, or card games with their friends. I am going to list some activities that you might have bet money on.

1a. In the past 12 months, how often did you bet or spend money on Lottery tickets like the 649, Super 7, or POGO? Would you say daily, 2 to 6 times a week, about once a week, 2–3 times a month, about once a month, between 6–11 times a year, between 1–5 times a year, or never?

<1> Daily <2> 2 to 6 times/week <3> About once/week <4> 2–3 times/month <5> About once/month <6> Between 6–11 times/year <7> Between 1–5 times/year <8> Never <97> R volunteers "I do not gamble" *[n.b. If this response appears twice, skip to 17*] <98> Don't know <99> Refused

b. In the past 12 months, how often did you buy daily lottery tickets like Pick 3?

(response categories for a. repeated for b. through w.)

c. In the past 12 months, how often did you buy instant win or scratch tickets like break open, pull tab, or Nevada strips?

d. In the past 12 months, how often did you buy raffle or fundraising tickets?

e. In the past 12 months, how often did you bet on horse races (i.e. live at the track and/or off-track)?

f. In the past 12 months, how often did you play bingo?

Screen for casino gambling:
In the past 12 months, have you gambled at any type of casino including illegal or charity casinos?

<1> yes [go to 1g] <5> no [go to 1l] <97> R volunteers "I do not gamble" <98> don't know <99>refused [go to 1m]

g. In the past 12 months, how often did you bet or spend money on coin slot machines or VLT's in a casino?

h. In the past 12 months, how often did you play poker in a casino?

i. In the past 12 months, how often did you play blackjack in a casino?

j. In the past 12 months, how often did you play roulette in a casino?

k. In the past 12 months, how often did you play keno in a casino?

l. In the past 12 months, how often did you play craps in a casino?

m. In the past 12 months, how often did you play video lottery terminals (VLTs)

Other than at casinos *[vlt= coins are not dispensed]***?**

n. In the past 12 months, how often did you play a sports lottery like Sport Select (e.g. Pro Line, Over/Under, Point Spread)?

o. In the past 12 months, how often did you bet or spend money on sports pools?

p. In the past 12 months, how often did you bet on cards, or board games with family or friends?

q. In the past 12 months, how often did you bet or spend money on games of skill such as pool, bowling, or darts?

r. In the past 12 months, how often did you bet on arcade or video games?

s. In the past 12 months, how often did you gamble on the Internet?

t. In the past 12 months, how often did you bet on sports with a bookie?

u. In the past 12 months, how often did you personally invest in stocks, options, or commodities markets?

INTERVIEWER: If asked, this does NOT include mutual funds, RRSPs
CHECK: If never to all gambling, or flagged as "do not gamble" at least twice, send to C section.

2. How many … ? *(response categories for a. repeated for b. through v.)*

a. you buy lottery tickets like the 649, Super 7 or POGO?

INTERVIEWER: Enter EXACT # of MINUTES here please [CONVERT HOURS, AND DO NOT ROUND!]

<1–480> Enter number of MINUTES <481> more than 8 hours <998> Don't know <999> refused

b. Minutes do you normally spend each time you buy daily lottery tickets like Pick 3?

c. Minutes do you normally spend each time you buy instant win or scratch tickets like break open, pull-tab or

Nevada strips?

d. Minutes do you normally spend each time on raffle or fundraising tickets?
e. Hours do you normally spend each time you bet on live horse races at the track and/or off track?
f. Hours or minutes do you normally spend each time you play bingo?
g. Hours or minutes do you normally spend each time you play coin slot machines or VLT's in a casino?
h. Hours or minutes do you normally spend each time you play poker in a casino?
i. Hours or minutes do you normally spend each time you play blackjack in a casino?
j. Hours or minutes do you normally spend each time you play roulette in a casino?
k. Hours or minutes do you normally spend each time you play keno in a casino?
l. Hours or minutes do you normally spend each time you play craps in a casino?
m. Hours or minutes do you normally spend each time you play video lottery terminals (VLTs) OTHER THAN AT CASINOS (VLT = coins are not dispensed)?
n. Minutes do you normally spend each time you play a sports lottery like Sport Select (e.g. Pro Line, Over/Under, Point Spread)?
o. Hours or minutes do you normally spend each time you play sports pools?
p. Hours or minutes do you normally spend each time you play cards or board games with family or friends?
q. Hours or minutes do you normally spend each time you bet on games of skill such as pool, bowling or darts?
r. Hours or minutes do you normally spend each time you bet on arcade or video games for money?
s. Hours or minutes do you normally spend each time you gamble on the internet?
t. Minutes do you normally spend each time you bet on sports with a bookie?
u. Hours or minutes do you normally spend evaluating stocks, options, or commodities each time you invest?

3. How much money, not including winnings, do you spend on …

a. Lottery tickets like the 649, Super 7 or POGO in a typical month?

(response categories for a. repeated for b. through w.)
INTERVIEWER: If asked for clarification, we mean spending that is out of pocket, and doesn't include money won and THEN spent.

<1–7777> enter number of dollars <d> don't know <r> refused

b. Daily lottery tickets like Pick 3 in a typical month?
c. Instant win or scratch tickets like break open, pull tab or Nevada strips in a typical month?
d. Raffle or fundraising tickets in a typical month?
e. Live horse races at the track and/or off track in a typical month?
f. Bingo in a typical month?
g. Coin slot machines or VLT's in a typical month?
h. Poker in a casino in a typical month?
i. Blackjack in a casino in a typical month?
j. Roulette in a casino in a typical month?
k. Keno in a casino in a typical month?
l. Craps in a casino in a typical month?
m. Video lottery terminals (VLTs) OTHER THAT AT CASINOS (VLT=coins not dispensed) in a typical month?
n. Sports lotteries like Sport Select (or, Pro Line, Over/Under, Point Spread) in a typical month?
o. Sports pools in a typical month?
p. Cards, or board games with family or friends, in a typical month?
q. Games of skill such as pool, bowling or darts in a typical month?
r. Arcade or video games in a typical month?
s. Gambling on the internet in a typical month?
t. Sports with a bookie in a typical month?
u. How much money, INCLUDING profits from earlier investments, do you spend on stocks, options, or commodities in a typical month?

4. In the past 12 months, what is the largest amount of money you ever spent on…
a. Lottery tickets like the 649, Super 7 or POGO in any one day?

(response categories for a. repeated for b. through w.)

<1–7777> enter number of dollars <d> don't know <r> refused

b. Daily lottery tickets like Pick 3 in any one day?
c. Instant win or scratch tickets like break open, pull tab or Nevada strips in any one day?
d. Raffle or fundraising tickets in any one day?
e. Live Horse races at the track and/or off track in any one day?
f. Bingo in any one day?
g. Coin slot machines or VLT's in any one day?
h. Poker in a casino in any one day?
i. Blackjack in a casino in any one day?

j. Roulette in a casino in any one day?
k. Keno in a casino in any one day?
l. Craps in a casino in any one day?
m. Video lottery terminals (VLTs) OTHER THAN AT CASINOS(VLT = coins are not dispensed) in any one day?
n. Sports lotteries like Sport Select (or Pro Line, Over/Under, Point Spread) in any one day?
o. Sports pools in any one day?
p. Cards or board games with family or friends in any one day?
q. The outcome of games of skill such as pool, bowling or darts in any one day?
r. Arcade or video games in any one day?
s. Gambling on the Internet in any one day?
t. Sports with a bookie in any one day?
u. How much money, INCLUDING profits from earlier investments, do you spend on stocks, options, or commodities in any one day?

CHECK: IF DON'T GAMBLE GO TO 18.

Section 2 — Problem Gambling Assessment
[Items 5 through 13 are scored. Score 1 for each response of "sometimes", 2 for each "most of the time" and 3 for each "almost always".]

Some of the next questions may not apply to you, but please try to be as accurate as possible.

THINKING ABOUT THE LAST 12 MONTHS...

5. Have you bet more than you could really afford to lose?
Would you say never, sometimes, most of the time, or almost always?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

6. Still thinking about the last 12 months, have you needed to gamble with larger amounts of money to get the same feeling of excitement?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

7. When you gambled, did you go back another day to try to win back the money you lost?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

8. Have you borrowed money or sold anything to get money to gamble?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

9. Have you felt that you might have a problem with gambling?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

10. Has gambling caused you any health problems, including stress or anxiety?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

11. Have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

12. Has your gambling caused any financial problems for you or your household?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

13. Have you felt guilty about the way you gamble or what happens when you gamble?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

14. Have you lied to family members or others to hide your gambling?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

15. Have you bet or spent more money than you wanted to on gambling?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

16. Have you wanted to stop betting money or gambling, but didn't think you could?
<1> Never <3> Sometimes <5> Most of the time <7> Almost always <8> Don't know <9> Refused

Section 3 — Correlates

Next, we explore some of your beliefs about gambling, as well as any early experiences you have had with gambling or betting money.

For each of the following, please tell me if you strongly agree, agree, disagree, or strongly disagree?

17. After losing many times in a row, you are more likely to win. Do you strongly agree, agree, disagree, or strongly disagree?

<1> Strongly agree <3> Agree <5> Disagree <7> Strongly disagree <8> Don't know <9> Refused

18. You could win more if you used a certain system or strategy.

<1> Strongly agree <3> Agree <5> Disagree <7> Strongly disagree <8> Don't know <9> Refused

19. Do you remember a big win when you first started gambling?

<1> yes<5> no<8> Don't know <9> Refused

20. Do you remember a big LOSS when you first started gambling?

<1> yes<5> no<8> Don't know <9> Refused

21. Has anyone in your family EVER had a gambling problem?

<1> yes<5> no<8> Don't know <9> Refused

22. Has anyone in your family EVER had an alcohol or drug problem?

<1> yes<5> no<8> Don't know <9> Refused

CHECK: IF DON'T GAMBLE, SKIP TO 25 HERE.

23. IN THE LAST 12 MONTHS, have you used alcohol or drugs while gambling?

<1> yes<5> no<8> Don't know <9> Refused

24. In the last 12 months, have you gambled while drunk, or high?

<1> yes <5> no <8> Don't know <9> Refused

25. Have you felt you might have an alcohol or drug problem?

<1> yes <5> no <8> Don't know <9> Refused

CHECK: IF DON'T GAMBLE SKIP TO 27

26. In the last 12 months, if something painful happened in your life, did you have the urge to gamble?

<1> yes (includes doing as well as having the urge) <5> no <8> Don't know <9> Refused

27. In the last 12 months, if something painful happened in your life, did you have the urge to have a drink?

<1> yes (includes doing as well as having the urge) <5> no <8> Don't know <9> Refused

28. In the last 12 months, if something painful happened in your life did you have the urge to use drugs? or medication?

<1> yes (includes doing as well as having the urge) <5> no <8> Don't know <9> Refused

29. Still thinking about the last 12 months, have you been under a doctor's care because of physical or emotional problems brought on by stress?

<1> yes <5> no <8> Don't know <9> Refused

30. Have you felt seriously depressed?

<1> yes <5> no <8> Don't know <9> Refused

CHECK: IF NON-GAMBLER SKIP TO INTRO TO DEMOGRAPHICS.

31. Have you seriously thought about or attempted suicide as a result of your gambling?

<1> yes <5> no <8> Don't know <9> Refused

Section 4 — Demographics

Finally, we would like to ask you some basic background questions. Like all your other answers, this information will be kept strictly confidential.

32. In what year were you born?

<1890–1981> Enter year <9997> After 1981 <9998> don't know <9999> Refused

33. Currently are you married, living with a partner, widowed, divorced, separated, or have you never been married?

<1> Married <2> Living with a partner <3> Widowed <4> Divorced <5> Separated <6> Never married <8> Don't know <9> Refused

34.a. To what ethnic or cultural group did you or your ancestors belong on first coming to this country?

INTERVIEWER: If R is not clear, say "Are you Scottish, Chinese, Greek, or something else?"

<1> Australian <14> French <26> Jewish <8> Serbia <2> Austrian <10> Finnish <27> Korean <35> Sikh <3> Bahamian <15> German<28> Lebanese<36> Somalian <4> Bangladeshi <16> Greek<8> Macedonian <9> Slovakian <5> BLACK/African<17> Guyanese <1> New Zealand<37> Spanish <6> British <18> Haitian<11> Netherlands<38> Sri Lanka <7> Chinese<11> Holland <29> Nigerian <10> Swedish <8> Croatian <19> Hungarian<10> Norwegian<38> Tamil <9> Czech<20> Irish<30> Pakistani<39> Trinidadian <10> Danish<21> Italian <31> Philipino<40> Ukrainian <11> Dutch<22> Indian<32> Polish <41> Vietnamese <6> ENGLISH<23> Israeli<33> Portuguese <8> Yugoslavian <12> El Salvador <24> Jamaican<34> Russian<6> Welsh <13> Ethiopian <25> Japanese<6> SCOTTISH <0>Other (specify)[specify] <95> Native Indian, Inuit <96>Canadian [go to 34c] <98>Don't know [go to 36] <99> Refused [go to 36] [go to 34b]

34.b. *INTERVIEWER: Enter SECOND mention only here.*

<97> NO SECOND MENTION

<1> Australian <14> French <26> Jewish <8> Serbia<2> Austrian <10> Finnish <27> Korean <35> Sikh<3> Bahamian <15> German<28> Lebanese<36> Somalian<4> Bangladeshi <16> Greek<8> Macedonian <9> Slovakian<5> BLACK/African<17> Guyanese<1> New Zealand<37> Spanish<6> British <18> Haitian<11> Netherlands<38> Sri Lanka<7> Chinese<11> Holland <29> Nigerian <10> Swedish<8> Croatian <19> Hungarian<10> Norwegian<38> Tamil<9> Czech<20> Irish<30> Pakistani<39> Trinidadian<10> Danish<21> Italian <31> Philipino<40> Ukrainian<11> Dutch<22> Indian<32> Polish <41> Vietnamese<6> ENGLISH<23> Israeli<33> Portuguese <8> Yugoslavian<12> El Salvador <24> Jamaican<34> Russian<6> Welsh<13> Ethiopian <25> Japanese<6> SCOTTISH<0> Other (specify)[specify]<95> Native Indian, Inuit<96> Canadian [go to 34c]<98> Don't know <99> Refused [go to 35]

34c. In addition to being Canadian to what ethnic or cultural group did you or your ancestors belong on first coming to this continent?

<1> Australian <14> French <26> Jewish <8> Serbia<2> Austrian <10> Finnish <27> Korean <35> Sikh<3> Bahamian <15> German<28> Lebanese<36> Somalian<4> Bangladeshi <16> Greek<8> Macedonian <9> Slovakian<5> BLACK/African<17> Guyanese <1> New Zealand<37> Spanish<6> British <18> Haitian<11> Netherlands<38> Sri Lanka<7> Chinese<11> Holland <29> Nigerian <10> Swedish<8> Croatian <19> Hungarian<10> Norwegian<38> Tamil<9> Czech<20> Irish<30> Pakistani<39> Trinidadian<10> Danish<21> Italian <31> Philipino<40> Ukrainian<11> Dutch<22> Indian<32> Polish <41> Vietnamese<6> ENGLISH<23> Israeli<33> Portuguese <8> Yugoslavian<12> El Salvador <24> Jamaican<34> Russian<6> Welsh<13> Ethiopian <25> Japanese<6> SCOTTISH<0> Other (specify)[specify]<95> Native Indian, Inuit<96> Canadian<98> Don't know <99> Refuse

35. What is the highest level of education you have completed?

<1> No schooling<2> Some elementary school<3> Completed elementary school<4> Some high school/junior high<5> Completed high school<6> Some community college<7> Some technical school (College Classique, CEGEP)<8> Completed community college<9> Completed technical school (College Classique, CEGEP)<10> Some University<11> Completed Bachelor's Degree (Arts, Science, Engineering, etc.)<12> Completed Master's degree: MA, MSc, MLS, MSW, etc.<13> Completed Doctoral Degree: PhD, "doctorate"<14> Professional Degree (Law, Medicine, Dentistry)<98>Don't know <99> Refused

36. What is your present job status? Are you employed full-time, employed part-time, unemployed, a student, retired or a homemaker?

INTERVIEWER: If respondent gives more than one answer, record the one that appears first on the list.

<1> Employed full-time (30 or more hrs/week) [go to 37] <2> Employed part-time (less than 30hrs/week) [go to 37] <3> Unemployed (out of work but looking for work) [go to 37] <4> Student — -employed part-time or full-time [go to 37] <5> Student — not employed [go to 38a] <6> Retired [go to 38a] <7> Homemaker [go to 38a] <0> Other (Specify)[specify][go to 38a] <98> Don't know [go to 38a] <99> Refused [go to 38a]

37. What type of work do you currently do (or, do you do when you are employed)?

INTERVIEWER: If necessary, say "what is your job title?"

<1> enter text, end with ///[specify]<98> Don't know <99> Refused

38.a. Could you please tell me how much income you and other members of your household received in the year ending December 31st 1998, before taxes? Please include income FROM ALL SOURCES such as savings, pensions, rent, and unemployment insurance as well as wages. TO THE NEAREST THOUSAND DOLLARS, what was your TOTAL HOUSEHOLD INCOME before taxes and other deductions were made?

<1–997> Enter actual income [go to 39] <998> Don't know <999> Refused

38.b. We don't need the exact amount; could you tell me which of these broad categories it falls into...

<1> less than $20,000 <2> between $20,000 and $30,000 ($29,999.99) <3> between $30,000 and $40,000 <4> between $40,000 and $50,000 <5> between $50,000 and $60,000 <6> between $60,000 and $70,000 <7> between $70,000 and $80,000 <8> between $80,000 and $90,000 <9> between $90,000 and $100,000 <10> between $100,000 and $120,000 <11> between $120,000 and $150,000, <12> or more than $150,000? <98> Don't know <99> Refused

39. How many people under 18 years-of-age live with you?

<0> None <1–6> enter number of people <7> seven or more <8> don't know <99> refused

40. What is your religion?

<1> Protestant <2> Catholic <3> Jewish <4> Muslim <5> Eastern beliefs (Buddhism, Hinduism) <0> Other (Specify) [specify] <7> No religion [go to 42] <8> Don't know <9> Refused

41. How important is religion in your life? Would you say very important, somewhat important, not very important, or not important at all?

<1> Very important <3> Somewhat important <5> Not very important <7> Not important at all <8> Don't know <9> Refused

42. We hope to speak to some people again. May we call you for a short follow up?

<1> Yes <5> No/Refused

Thank you for helping us with this survey. Your responses are very important to us, and we do appreciate the time it has taken to answer our questions. As a courtesy, we offer all participants a telephone number, in case they wish to speak to someone who knows more about gambling or gambling problems. I have a phone number available for your area, would you like that number?

Thanks again for helping us out.

Appendix 3

The Victorian Gambling Screen

Please answer using the scale: (Read out) "Never, rarely, sometimes, often, always".

"Your answers will be for the last 12 months."

"So in the last 12 months…"

Interviewer note: DO NOT PROMPT FOR CAN'T SAY OR NOT APPLICABLE.

For all scale questions, if respondent answers no code as never = 0.

		Never	Rarely	Sometimes	Often	Always	Can't say	N/A
Q1	Has gambling been a good hobby for you? 0 1 2 3 4 8 9	0	1	2	3	4	5	6
Q2	Nowadays, when you gamble, is it fun?	0	1	2	3	4	5	6
Q3	Have you gambled with skill?	0	1	2	3	4	5	6
Q4	Nowadays, when you gamble, do you feel as if you are on a slippery slope and can't get back up again?	0	1	2	3	4	5	6
Q5	Has your need to gamble been too strong to control?	0	1	2	3	4	5	6
Q6	Has gambling been more important than anything else you might do?	0	1	2	3	4	5	6
Q7	Have you felt that after losing you must return as soon as possible to win back any losses?	0	1	2	3	4	5	6
Q8	Has the thought of gambling been constantly in your mind	0	1	2	3	4	5	6
Q9	Have you lied to yourself about your gambling?	0	1	2	3	4	5	6
Q10	Have you gambled in order to escape from worry or trouble?	0	1	2	3	4	5	6
Q11	Have you felt bad or guilty about your gambling?	0	1	2	3	4	5	6
Q12	Have you thought you shouldn't gamble or should gamble less?	0	1	2	3	4	5	6
Q13	How often has anyone close to you complained about your gambling?	0	1	2	3	4	5	6
Q14	How often have you lied to others to conceal the extent of your involvement in gambling?	0	1	2	3	4	5	6
Q15	How often have you hidden betting slips, Lotto tickets, gambling money or other signs of gambling from your spouse, partner, children or other important people in your life?	0	1	2	3	4	5	6

Again thinking about the past 12 months……. (Read out questions), Record response as Yes or No.

For YES response ask second question Q (b), otherwise continue to next Q (a)

These questions are only applicable if respondent has a partner.

If no partner or significant other code N/A and continue with Q19.

			Yes	No	N/A
Q16a	Have you and your partner put off doing things together?		1	2	9
Q16b	If yes, was this made worse by your gambling?	Yes 1	Partly 2	No 3	N/A 9
			Yes	No	N/A
Q17a	Have you and your partner criticised one another?		1	2	9
Q17b	If yes, was this made worse by your gambling?	Yes 1	Partly 2	No 3	N/A 9
			Yes	No	N/A
Q18a	Has your partner had difficulties trusting you?		1	2	9
Q18b	If yes, was this made worse by your gambling?	Yes 1	Partly 2	No 3	N/A 9

Please use the scale as before to answer the next questions.

"Never, rarely, sometimes, often, always".

In the past 12 months …….

		Never	Rarely	Sometimes	Often	Always	Can't say	N/A
Q19	How often have you spent more money on gambling than you can afford?	0	1	2	3	4	5	6
Q20	How often is your gambling made it harder to make money last from one pay day to the next?	0	1	2	3	4	5	6
Q21	How often have you had to borrow money to gamble with?	0	1	2	3	4	5	6

Appendix 4

The GA 20

1. Has gambling ever made your home life unhappy?
2. Did gambling affect your reputation?
3. Have you ever felt remorse after gambling?
4. Did gambling cause a decrease in your ambition or energy?
5. Did you ever gamble to get money to pay debts or solve some financial difficulty?
6. Did you ever lose time from work due to gambling?
7. After losing, did you feel you must return as soon as possible and win back your losses?
8. After a win, did you have a strong urge to return and win more?
9. Did you ever gamble until your last dollar was gone?
10. Did you ever borrow to finance your gambling?
11. Have you ever sold anything to finance your gambling?
12. Were you ever reluctant to use "gambling money" for normal expenditures?
13. Did gambling make you careless about the welfare of yourself and your family?
14. Have you ever gambled to escape worry or trouble?
15. Did you ever gamble longer than you had planned?
16. Have you ever committed or considered committing an illegal act to finance your gambling?
17. Has gambling ever caused you to have difficulty sleeping?
18. Do arguments, disappointments, or frustration create the uncontrollable urge to gamble?
19. Did you ever have an urge to celebrate good fortune by a few hours of gambling?
20. Have you ever considered self-destruction as a result of gambling?

Gamblers Anonymous (1984). (3rd Edition). Los Angeles: Gamblers Anonymous Publishing.

Appendix 5

DSM–IV Pathological Gambling

A. Persistent and recurrent maladaptive gambling behaviour as indicated by five (or more) of the following.

(1) is preoccupied with gambling (e.g. preoccupied with reliving past gambling experiences, handicapping or planning the venture, or thinking of ways to get money with which to gamble)

(2) needs to gamble with increasing amounts of money in order to achieve the desired excitement

(3) has repeated unsuccessful efforts to control, cut back, or stop gambling

(4) is restless or irritable when attempting to cut down or stop gambling

(5) gambles as a way of escaping from problems or relieving a dysphoric mood (e.g., feeling of hopelessness or guilt, anxiety, depression)

(6) after losing money gambling often returns another day to get even ("Chasing one's losses)

(7) lies to family members, therapist, or others to conceal the extent of involvement with gambling

(8) has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling

(9) has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling

(10) relies on others to provide money to relieve a desperate financial situation caused by gambling

B. The gambling behaviour is not better accounted for by a Manic Episode.

Appendix 6

Life Areas Measure

A. During the last 12 months, was there a time when you felt your gambling had a harmful effect on your friendships or social life?

B. During the last 12 months, was there a time when you felt your gambling had a harmful effect on your physical health?

C. During the last 12 months, was there a time when you felt your gambling had a harmful effect on your home life or marriage?

D. During the last 12 months, was there a time when you felt your gambling had a harmful effect on your work, studies, or employment opportunities?

E. During the last 12 months, was there a time when you felt your gambling had a harmful effect on your financial position?

Smart, R. and Ferris, J. (1996). Alcohol, drugs and gambling in the Ontario adult population, 1994. *Canadian Journal of Psychiatry*, 4(1), 36-45.