HEALTHY HORIZONS CONSULTING

Performance and Enhancement of the Canadian Problem Gambling Index (CPGI): Report and Recommendations

Prepared for:

Inter-provincial Funding Partners for Research Into Problem Gambling

- Alberta Gaming Research Institute
- Addictions Foundation of Manitoba
- British Columbia Gaming Policy and Enforcement Branch
- Manitoba Gaming Control Commission
- Ministère de la Santé et des Services Sociaux de Québec
- Nova Scotia Gaming Research Foundation
- Ontario Problem Gambling Research Centre

Sponsoring Agency: Canadian Centre on Substance Abuse

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September 20, 2006

ACKNOWLEDGEMENTS

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1   INTRODUCTION

In 2005, the Inter-provincial Funding Partners for Research into Problem Gambling issued a Request for Applications to conduct a review into the experiences of principal investigators with the Canadian Problem Gambling Index (CPGI). The Funding Partners are a consortium of provincially based resources that fund problem gambling research initiatives of common interest. For this initiative, participating partners include funders from Nova Scotia, Quebec, Ontario, Manitoba, Alberta and British Columbia. The Ontario Problem Gambling Research Centre (OPGRC) acted as the administrative partner, and the Canadian Centre on Substance Abuse (CCSA) serves as the project management agency.

1.1   Background

In February 2001, a newly developed instrument was launched to measure the prevalence of gambling and problem gambling in the general population. The Canadian Problem Gambling Index (CPGI), introduced under the aegis of the Canadian Centre on Substance Abuse (CCSA) on behalf of a consortium of provincial funding resources, was developed to provide a more accurate measure than other available instruments. The CPGI was validated with a general population sample, unlike other instruments (e.g. SOGS and DSM-IV) that were constructed using clinical samples of problem gamblers. As a result, the CPGI provides greater distinction among gambling sub-types, and contributes to our understanding of the distribution from low-risk to problem gambling.

Since its launch, the CPGI has been used in all ten Canadian provinces[1] and in Australia (Queensland, Victoria and Tasmania[2]), Norway[3] and Iceland. In addition, it has been included in the national Canadian Community Health Survey – Mental Health and Well-being (Cycle 1.2). Although not the focus of this review, the CPGI has been used for purposes other than population prevalence studies, including as a clinical intake instrument and in a range of research initiatives.

The CPGI prevalence studies are listed in Appendix A, and include 12 Canadian and 6 International Studies.[4]   In the process, several principal investigators have gained substantial

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[1] After the Request for Applications had been written, Newfoundland and Labrador produced a report on their gambling prevalence study using the CPGI and it was included in this review.

[2] During the review, the research team discovered that Tasmania produced a report on their gambling prevalence survey that used the CPGI. The study was not included in the review but it was added to the inventory of CPGI prevalence studies.

[3] The Request for Applications indicated that there had been a CPGI prevalence survey conducted in Denmark. The research team did not find a population survey for Denmark but a CPGI prevalence survey was found for Norway and it was included in this review as a replacement for Denmark.

[4] During the review, it was discovered that a prevalence survey that used the CPGI will be reported by New Mexico and the upcoming New Zealand National Health Survey is expected to use the CPGI.

experience in the use of CPGI. The Funding Partners anticipated that this researcher base would provide valuable feedback on the instrument's performance in meeting its objectives, and would provide a strong basis for refining the instrument.

2. DEVELOPMENT OF THE CPGI

2.1 Development Process

The development of the Canadian Problem Gambling Index (CPGI) was the result of the Canadian Gambling Prevalence Research Project. In 1996, a group of provincial government representatives undertook a collaborative project to develop a new, theory-based instrument to measure problem gambling in general population surveys.

Previous prevalence studies were conducted using the DSM-IV and the South Oaks Gambling Screen (SOGS), both of which were developed using clinical samples of self-selecting problem gamblers in treatment. They did not differentiate between different types of gamblers and "sub-clinical problem gamblers in the general population.

The development of the Canadian Problem Gambling Index (CPGI) was undertaken in two phases: Development and Testing. Phase I addressed the following objectives.

1. To develop a conceptual framework for understanding problem gambling;

2. To develop an operational definition of problem gambling to guide research;

3. To develop measures of problem gambling for use in general population research

The Phase I report, *Measuring Problem Gambling in Canada: Final Report – Phase I* (Ferris, Wynne and Single, 1999), provided the following definition for problem gambling:

> Problem gambling is gambling behavior that creates negative consequences for the gambler, others in his or her social network, or for the community (Ferris et al., 1999).

Phase II involved the fine-tuning of the CPGI and validity and reliability testing, consistent with the objectives:

1. To produce a valid and reliable instrument possible for general population surveys;

2. To produce psychometric data supporting the validity and reliability of the CPGI;

3. To produce a user manual with sufficient detail to guide administration and replication;

4. To provide a means to compare CPGI results with other instruments.

The Phase II report is entitled *The Canadian Problem Gambling Index: Final Report* (Ferris and Wynne, 2001b). The Phase II process began with a pilot test of the instrument, followed by a large general population survey of a national and regional sample of 3,120 Canadian adults, a reliability retest with a sub-sample of 417, and clinical validation interviews with another sub-sample of 148. In reference to the nine-scored items of the Problem Gambling Severity Index

(PGSI), the authors stated they had "demonstrated strong validity and reliability for the scored portion of the CPGI" (Ferris and Wynne, 2001b).

To assist with use of the CPGI, Phase II also produced a *Draft – User Manual* (Ferris and Wynne, 2001a and also see Wynne, 2003), which also outlined the means for comparing CPGI results with those of previous studies using DSM-IV and/or SOGS component items.

2.2 Description of the CPGI

Without demographic questions, the CPGI is comprised of 31 items within three sections: Gambling Involvement, Problem Gambling Assessment, and Problem Gambling Correlates.

Involvement: Twenty-two (22) items provide indicators of gambling involvement: types of gambling activity, frequency of play, duration of play and spending on gambling.

Assessment: The problem gambling assessment section consists of twelve (12) items. Nine (9) of these comprise the Problem Gambling Severity Index (PGSI) and include four (4) behaviours and five (5) consequences. The PGSI can be scored to describe the prevalence rate of problem gambling in a population. The PGSI categorizes survey respondents into five groups: non-gamblers, non-problem gamblers, low risk gamblers, moderate risk gamblers, and problem gamblers.

Correlates: The correlates of problem gambling consist of fifteen (15) items that can be used to develop profiles of different types of gamblers and problem gamblers. The last 11 items are demographic questions that bring the total number of questions to 42.

3. APPROACH AND METHODS

3.1 Research Design

The purpose of this research was: (1) to assess the performance of the CPGI in meeting its objectives and (2) to inform the periodic refinement of the CPGI. The primary research design was a key informant survey, using a semi structured format, examining the experiences of the Original Developers of the CPGI and the Principal Investigators that have conducted CPGI prevalence studies in Canada and other jurisdictions. A limited number of additional Other Investigators and Gambling Prevalence Experts were contacted and interviewed.

3.2 Research Questions

The research questions for this project were:

1. From experience gained by respondents that have used the CPGI to date, to what extent does the instrument meet its stated objectives, and in which ways does it meet these objectives and in which ways does it not?

2. Which aspects of the CPGI, if any, would benefit from re-assessment, modification, or fine-tuning, and what are the suggested modifications and supporting rationales?

3. Which steps might be taken to further enhance the utility and utilization of the CPGI?

3.3 Sample

Twenty Key Informants were interviewed, with one representing two categories:

- Original Developers: 3 (out of 4);
- Canadian, Principal Investigators: 9 (of 11 identified); one of those not interviewed was the Principal Investigator in two provinces;
- Canadian Other Investigators: 2;
- International Principal Investigators: 4;
- Gambling Prevalence Experts: 3.

The full list of key informants is found in Appendix B.

3.4 Data Collection Framework

The research team developed an open-ended questionnaire to examine the efficiency and effectiveness of the CPGI in the following areas:

- achieving original objectives;
- measuring prevalence of gambling and problem gambling;
- identifying gambling activities, frequency, duration and expenditure (wagering);
- measuring problem gambling severity and problem gambling sub-types;
- contributing to understanding progression from low-risk to gambling problems;
- addressing other related variables: socio-demographic, health, mental health, substance abuse;
- fielding items and questions;
- providing reliability and validity;
- comparing data to other studies.

The core questionnaire was reviewed by the oversight committee and pre-tested with two of the original developers before finalization. The final questionnaire is found in Appendix C. A draft report was submitted to the oversight committee for feedback and resulting recommendations were integrated into the final report.

4. FINDINGS

4.1 Section 1: CPGI Objectives

As stated, the original objectives for the CPGI were:

- To develop a measure of gambling involvement;
- To develop a measure for problem gambling assessment, examining:
  - problem gambling behaviours; and
  - problem gambling adverse consequences;
- To develop a measure of problem gambling correlates.

Q1.1: In your general view, how does the CPGI perform in meeting its original objectives?

Almost all respondents consider the CPGI to have met its original objectives "well" and a few "very well". Most consider the CPGI to be an improvement over previous instruments.

- some respondents are impressed with development process for the CPGI (including testing in advance of launching) and consider the gambling involvement and problem gambling correlates to be inclusive and comprehensive;

- some respondents consider the CPGI to be a new, theory-based instrument that measures gambling and problem gambling accurately (via its sensitivity and specificity properties);

- the use of a four-point scale in the PGSI is considered an important improvement over other earlier instruments.

Overall, the PGSI is considered successful in measuring gambling broadly by including behaviours and adverse consequences and introducing defined categories for non-problem gamblers, low risk gamblers, moderate risk gamblers and problem gamblers. In addition, this categorization schema is viewed as aiding prevention efforts.

In reference to the problem gambling assessment:
- a few respondents consider the CPGI to be like other instruments, "no better, no worse";

- one pointed out that eight of the nine scored items are based on questions borrowed from the DSM and SOGS; accordingly, it was suggested that harm is measured by clinically derived measures of severity (in spite of previous criticisms of the nature of earlier instruments) and comparisons with the results of these earlier instruments are, therefore, not independent;

- at least one respondent laments the absence of a "lifetime gambling" measure

- a few wonder what is really being measured and whether there are too many false positives; these respondents strongly suspect it will be difficult to improve the CPGI until the field has a better understanding of problem and/or pathological gambling.

In reference to the correlates:
- it was noted that they are limited;

- one respondent suggested that the correlates do not include some now known to be relevant;

- others noted the absence of correlates related to relationships with friends, the community, and the environment.

Q1.2: In your view, has the CPGI and its operational definition been successful in describing a new, more meaningful, broader, holistic, theory-based measure of gambling and problem gambling in the general population?

- A large majority of the respondents think the CPGI has been successful in describing a new, more meaningful, broader, holistic, theory-based measure of gambling and problem gambling in the general population.

- Most respondents consider the CPGI to be:

  o a broader, better measure of gambling and problem gambling than previous measures;

  o a thorough eclectic measure, based on multiple models, perspectives, dimensions and correlates;

  o superior to alternatives due to the range of response options (in the PGSI).

- On the more critical side:

  o one respondent notes that although the CPGI is as good as other measures, there is no "gold standard" to measure problem gambling;

  o the CPGI could benefit from more process variables and improved co-morbidity measures (e.g., alcohol, drug and depression problems);

  o one respondent wonders who are the people in the gambling categories;

  o others suggest more work is needed to validate the sub-types and cut-offs;

  o one respondent considers the "low risk" group to be "bogus" and points out that there are substantial differences between "moderate risk" gamblers who score 3, 4, and 5 and those who score 6 and 7;

  o one respondent indicated that the CPGI and the SOGS identify a very large number of problem gamblers who, when assessed in diagnostic clinical interviews, are judged to be false positives.

Once again, the construct of problem gambling was identified as a problem for the CPGI and the field. It was suggested that the current construct does not include a broad concept of harm (as defined, for example, in Australia) and the CPGI correlates do not include family, children, workplace and cultural norms. One respondent suggested that the CPGI is based on psychological theories at the expense of other perspectives such as social psychology and sociology.

Q1.3: In your view, has the CPGI been successful in measuring the prevalence of gambling and problem gambling in the general population?

About two thirds of the respondents consider the CPGI to have been successful in measuring prevalence of gambling and problem gambling in the general population. The supporters note that the CPGI identifies the large group of "low risk" and "moderate risk" gamblers who were

not identified by other survey instruments. The CPGI is considered to have provided a consistent measure of gambling and problem gambling across Canada.

- one respondent suggested that as a "relative" measure of gambling and problem gambling the CPGI does a great job but is not sure if it succeeds as an "absolute" measure;

- another suggested that as a measure of problem gambling the CPGI is state-of-the-art but the state-of-the-art is not very good;

- a couple of other respondents suggested the CPGI underestimates problem gambling (one referred to groups of known "heavy gamblers" who were administered the CPGI but did not score as problem gamblers).

Among the less positive respondents:

- some believe it does a good job of measuring gambling and not such a good job of measuring severity;

- conversely, others suggest it does a good job of measuring problem gambling and not such a good job of measuring gambling;

- it was noted that by using items borrowed from other instruments, based on clinical populations, the CPGI does not include low severity or moderate severity items (examples might include not setting wagering limits and/or not sticking to wager limits).

Q1.4: In your view, has the CPGI been successful in including adequate indicators of the environment and social context?

About half of the respondents consider the CPGI to have been successful in including adequate indicators of the environment and social context. The positive respondents consider the CPGI to do a better job than other instruments, recognizing that other instruments did not try to include indicators of the environment and social context.

- one respondent who only used the Problem Gambling Severity Index indicated that the environment and social context are not covered because the PGSI is based on "clinical" questions;

- one suggested that the environment and social context mean more than just family and household and that the CPGI needs refinement and needs to include friends and workplace;

- in reference to the gambling environment, the CPGI lacks attention to the proximity and density of gambling venues.

4.2 Section 2: CPGI Components

4.2.1 Gambling Involvement

The CPGI has a section on Gambling Involvement, comprised of five items addressed in questions 1 to 4 and typically asks about 20 different types of gambling activity in relation to:

1. Types of activities played in the past 12 months and frequency of play
2. Duration of play in a normal session
3. Money spent in a typical month
4. Largest amount ever spent in the past 12 months

Q2.1: **In your view, how does the CPGI perform in describing gambling and problem <u>Gambling Involvement</u>?**

A large portion of the respondents indicated that the CPGI performs well in describing Gambling Involvement, with some considering this area to be comprehensive and thorough.

- one respondent suggested that the gambling involvement data provide a wealth of information and permit the development of gambling profiles as well as comparisons between and among types of gambling activities and between and among jurisdictions;

- most respondents consider the section too lengthy and detailed, with too many repeated questions and gambling activities ("overkill"); accordingly, there are concerns about false negatives, respondent fatigue, and respondent drop-out, particularly from non-gamblers and low level gamblers.

- there is considerable doubt about subjects' ability to accurately recall and estimate gambling frequency, duration and spending (people "don't know," people "don't count" and people "don't remember") causing a significant number to consider the data unreliable due to under-estimating and under-reporting;

- one respondent suggested the data might be "relatively" but not "absolutely" reliable;

- the value of asking about the highest amount wagered in any one day for every gambling activity was questioned, and eliminating it would shorten the section;

- the universal relevance and value of identifying duration of play for all activities and comparing duration across activities was questioned, observing that:

  o the duration of purchasing lottery tickets varies little among gamblers and is far less relevant to this type of activity (in reference to lottery ticket spending, it was also pointed out that tickets are purchased as gifts and rarely, if every, is a lottery player a problem gambler);

  o in horse racing it is not clear what should be included in duration; it requires little time to place a bet but can involve long periods to prepare bets and watch races;

Whereas many respondents believe the CPGI addresses spending on gambling as well as any instrument, there are concerns about this area. Respondents suggest that the CPGI is not a diary and gamblers have problems remembering the amount spent over any period of time.

- it was suggested that it might be easier for people who play the lottery to remember what they spent than for those who play machines;

- it was suggested that problem gamblers might not want to report accurate money amounts over the telephone when other people in the house can hear the conversation.

Accordingly, some respondents indicated that they suspect under-estimating and under-reporting in the gambling involvement section and particularly on spending.

In the gambling involvement section, the first question asks about the frequency of involvement in the past 12 months with all the relevant types of gambling activities.

- one respondent has already undertaken to split the first question into two: the first asks about involvement and the second about frequency, but only for those activities where there is involvement with an activity;

- another uses a lumping or bundling system as filter for involvement in four larger gambling categories (lotteries, VLTs, games of skill and bingo, sports and internet) before asking more detailed questions:.

There were many suggested improvements for the gambling involvement section. Many respondents suggested bundling like activities into broader categories increase efficiency and reduce subject fatigue. In this way, detailed questions on type, frequency, duration, and spending would be pursued only where relevant to the subject. For frequency of gambling, respondents also suggested reducing the number of response categories to make responding easier and, perhaps, more accurate.

In summary, suggested improvements include:

- reconsider the value and usefulness of identifying the highest amount spent in one day;

- encourage the modification of gambling activities to match those in the study jurisdiction;

- add dog racing to the horse racing category;

- develop filters by bundling gambling activities into fewer and larger categories;

- reduce the number of response categories for the frequency of gambling questions;

- eliminate "duration" from activities where it is less relevant (e.g. lotteries);

- add "on average" to gambling involvement questions;

- use "ice breaker" questions before asking about gambling involvement;

- providing subjects with an explanation or strategy for estimating spending;

- anchor and focus the spending question to the most recent gambling session and/or the preferred gambling venue;

- add seasonal variations and reduce time periods;

- seek an open-ended response to spending questions;

- ask about "net" loss or "net" spending on gambling;

- include debt and/or accumulated debt as a result of gambling;

- including lifetime gambling;

- consider other methods for "frequency, duration and spending" (e.g. smart cards, diaries);

- fund additional methodological work to improve measurement of spending on gambling;

- update the user manual to include guidelines for analysis (merging categories) and the means to deal with "outliers" (problem gamblers who report huge expenditures);

4.2.2 Problem Gambling Assessment

The problem gambling assessment section of the CPGI includes the scored, nine-item Problem Gambling Severity Index (PGSI) and three questions that are not scored. The PGSI includes two domains: behaviours, with 5 scored items, and consequences, with 4 scored items.

Gambling Behaviours How often have you:

- bet more than you could really afford?
- needed to gamble with larger amounts of money to get the same feeling of excitement?
- gone back another day to try to win back the money you lost?
- borrowed money or sold anything to get money to gamble?
- felt that you might have a problem with gambling?

Gambling Consequences How often:

- have people criticized your betting or told you have a problem?
- have you felt guilty about the way you gamble or what happens when you gamble?
- has gambling caused you any health problems, including stress and anxiety?
- has your gambling caused you any financial problems for you or your household?

In addition, there are three items that are not scored: How often have you

- bet or spent more money than you wanted to gamble?
- lied to family members or others to hide your gambling?
- felt like you would like to stop betting money or gambling, but didn't think you could?

The assessment section, along with earlier questions on gambling participation, permits the identification of five exhaustive categories:

Non-gambling
Non-problem gambling
Low risk gambling
Moderate risk gambling
Problem gambling

Q2.2: Within the Problem Gambling Assessment section of the CPGI, have you used the three behaviour items that are not scored?

About half of the *investigators* used the non-scored behavioural items. Some apparent overlap was noted: two questions are similar to the SOGS (lying about gambling, loss of control) and the third, "betting more than you could afford" is similar to "betting more than you wanted" in the

scored items. Some like the questions and the comparisons they allow with other instruments. A few combine other instruments with the PGSI and do not need to use the CPGI non-scored items.

- one investigator considers the non-scored items to be as important as the scored items and suggests they be included in the PGSI;

- another finds the non-scored items useful and particularly for examining demographics and game selection;

- yet another finds the items useful, and suggests adding other items to them and conducting another validity study.

In summary, suggested improvements for the non-scored items include:

- integrate the non-scored items into the PGSI;

- add new items (e.g. loss of control, withdrawal, emotional family arguing)

- Consider conducting another validity study.

Q2.3: **In your view, how does the <u>Problem Gambling Severity Index</u> perform in measuring <u>Problem Gambling Severity and Problem Gambling Sub-Types</u>?**

In general, respondents consider the PGSI to do a very good job of measuring problem gambling. In contrast to other instruments, respondents particularly appreciate the multiple response choices in the PGSI (instead of just yes or no answers). A few suggest we cannot accurately measure problem gambling until we understand more about its nature. It was pointed out that the CPGI recently won a comparative review in Australia against the Victorian Gambling Screen and the South Oaks Gambling Screen.

Although respondents appreciate the effort to identify low risk and moderate risk gamblers, there is less confidence in the soundness of the labels, classifications, and cut-points which, at worst, are considered unexplained and arbitrary. One investigator suggests that low risk gamblers endorse the low threshold items and wonders if such people even have a problem. Some respondents suggest adopting fewer sub-type categories and others suggest adopting more.

Some investigators have changed category names (e.g. changing "low risk" to "at-risk", "moderate risk" to "moderate problem gamblers" and "problem gamblers" to "severe problem gamblers"). To increase statistical power, "moderate risk gamblers" are often added to "problem gamblers". One investigator added "low risk" gamblers to the "problem gambler" group. Respondents suggested that more research on the sub-types is needed, and that a guide to the analysis of sub-types would be a useful tool in an updated CPGI user manual.

Other suggestions include: adding items, adding theory-based items, adding items specifically for "low risk" and "moderate risk" categories, and weighting items.

Others yet related to the response choices and the administration of the instrument. In reference to the prompt "thinking about the last 12 months", it was suggested that the response "never" be replaced with "no" (the "never" response choice is not a logical response to the questions nor is it understood by subjects). One respondent wanted to add "how often" to the PGSI items.

Another suggested that, since the PGSI items are somewhat harsh and problem seeking in nature, they be placed last in the instrument, and introduced with a suggestion that "at first thought they might seem silly to you, but your honest participation is likely to be helpful to all gamblers".

Respondents call for more research, particularly efforts to study the labels, definitions, classifications, and cut-points for sub-types. In addition, it was suggested that the existing data sets be pooled and studied, and that longitudinal studies be undertaken.

In summary suggested improvements to the PGSI and its sub-types include:

- reconsider the question on borrowing due to the widespread use of credit cards;

- add items on:
  - loss of control;
  - withdrawal;
  - health;
  - setting betting limits;
  - sticking to betting limits;
  - arguing with family member to the point of emotional harm;
  - dealing with problem gambling consequences;
  - the impact of problem gambling;

- weight the items;

- revisit the sub-types: labels, classifications and cut-points;

- develop more empirical evidence for the definitions, labels, and cut points;

- identify new items to measure for low risk and moderate risk sub-types;

- consider new items to address lower severity;

- replace the response choice "never" with "no";

- add "how often" as a follow up to responses;

- introduce an introductory statement to increase completion of the PGSI;

- place the PGSI at the end of the instrument;

- revisit the construct or nature of problem gambling;

- conduct qualitative studies of sub-types;

- explore intra sub-type differences;

- conducting a meta study of existing data sets;

- conduct longitudinal studies with cohorts;

- conduct another validity study;

- develop a manual for the analysis of CPGI data, including the collapsing of sub-types.

Q2.4: **What do you think of the <u>Gambling Continuum</u> embraced within the <u>Problem Gambling Severity Index</u>: no gambling problems to low risk gambling to moderate risk gambling to problem gambling?**

The majority of respondents think positively of the continuum. There is strong support for the idea of a continuous variable and ordinal sub-types rather than the discreet or dichotomous variable in other instruments. There is less agreement about the empirical basis for the label, categories, and cut-points. In general, more research and validation is suggested.

There were many questions about the labels, categories, and cut-points. Differences between "non-problem" and "low risk" gamblers were questioned as were those between "low risk" and "moderate risk". One investigator questioned use of the label "risk" at all (i.e. does a few problems equal risk?). Another suggested adding another category of "extreme" or "severe" problem gambler. Another yet suggested adding a "moderate problem gambler" category.

Although one investigator did not think the continuum could be improved without better theory, many others support additional work on the continuum and its sub-types. Suggestions include the studying of classifications and definitions, conducting qualitative research, conducting a mega study of existing data, and conducting a full-blown validity study.

A summary of suggested improvements for the gambling continuum includes:

- adopt fewer problem gambling sub-types or categories;

- add more problem gambling sub-types or categories;

- change "sometimes" to "occasionally" or "rarely" as a response option;

- reconsider the concept of risk (i.e., defining risk as experiencing a problem rather than including specific risk behaviours such as not setting or exceeding limits);

- conduct qualitative research on problem gambling development and sub-types;

- conduct research on the definitions and classifications of problem gambling sub-types;

- develop additional items to measure "low risk" and "moderate risk";

- conduct a meta study of all existing data sets; include factor analysis and examine psychometric properties;

- conduct a full-blown validity study.

Q2.5: **How does the <u>Problem Gambling Severity Index</u> contribute to <u>Understanding Progression</u> from non-problem gambling, low risk gambling, moderate risk gambling and problem gambling?**

More than half of the respondents do not believe the PGSI contributes to understanding the progression through the categories. The CPGI as a cross-sectional prevalence instrument is considered to provide a snapshot that cannot address progression. It was suggested that progression could only be determined through longitudinal studies.

Some respondents suggested consideration of other ideas rather than progression.

- one investigator questioned the assumption of a "natural" progression to problem gambling;

- others referred to different pathways to the onset of problem gambling;

- one referred to problem gambling being a "dynamic" process;

- another suggested the consideration of "transition" as a better concept to describe movement among gambling categories.

Several respondents reported that the literature includes suggestions of differing pathways to problem gambling; others noted that the Ontario Problem Gambling Research Centre and the Alberta Gaming Research Centre are currently conducting longitudinal studies.

A summary of suggested improvements includes:

- ask about lifetime gambling;

- ask about increases or decreases in gambling over the past five years;

- test for the progression of gambling problems and transition among sub-types or categories through longitudinal studies;

- test for other pathways and concepts through longitudinal studies.

4.2.3 Problem Gambling Correlates

The CPGI contains a section on Problem Gambling Correlates that includes 15 questions, covering the following 9 variables:

- faulty cognitions: due for win after losses, having a winning system;

- first experiences: remember big win, remember big loss;

- family problems: had family gambling problem, family alcohol or drug problem;

- co-morbidity: gambled when using alcohol or drugs, gambled when high;

- problem recognition: felt you had an alcohol or drug problem;

- relieve pain: self-medicated by gambling, using alcohol, using drugs;

- stress: treated by a doctor for stress;

- depression: felt seriously depressed;

- suicide: thought seriously about suicide, attempted suicide

Q2.6: In your view, how does the CPGI perform in identifying <u>Problem Gambling Correlates</u>?

Many investigators used the CPGI Problem Gambling Correlates, some modified them, others used alternatives, and some used none. Of those who used the CPGI correlates, more than half considered them to have performed well.

The Original Developers indicated that the correlates were drawn from the literature, discussed by the key informants, and selected on the basis of these discussions. One suggested that some of the correlates are strongly related to the PGSI. Another respondent stated that the correlates represent extra information not provided by other instruments, but suggested that some have low correlations with problem gambling.

In general, respondents think that the right topics are covered but they provide only limited data. Some suggested that fewer correlates, covered in greater depth, would be better, while others suggested the addition of new correlates (e.g., dissociative status, emotion-seeking, social and environmental correlates, and harm to family, friends, and social function). A few suggested the removal some specific correlates (e.g. big wins and big losses). One suggested that the relative importance of each correlate should be considered.

Even though respondents consider the correlates to have performed well, it was generally recognized that there are only a few questions, many of which are examined as a one-item scale (one question) and produce very limited data. At the same time, most recognize that balance is required between retaining subjects and the number of questions that can be asked.

Some respondents suggested that items are questionable ("lost their usefulness") and need to be validated by evidence. One could not find the anticipated variability or patterns in these items, and could not develop the desired profiles for each sub-type. Another commented that responses are based on self-attribution.

Several respondents referred to weakness in the measurement of faulty cognitions. For example, using a system or strategy for games of skill does not necessarily indicate faulty cognition. A system might improve performance on games such as poker, Black Jack and, perhaps, sports betting. A few respondents suggested adding to the faulty cognition area. One offered the following items: I am more likely to win than lose, I have earned more than I have lost, I can often anticipate when I should play, and the more I gamble the better chance I have.

Other observations include:

- questions on family problems, alcohol/drugs, stress, depression and suicide are "generic";

- questions on personal alcohol and drug problems, depression and suicide (questions 25, 30 and 31) would benefit from adding the wording, "have you ever";

- questions on family gambling and alcohol or drug problems do not identify who in the family had problems;

- combining alcohol and drug problems into one item was questioned;

- questions on drug use do not specify which drugs;

- the stress question does not deal with gambling stress that is not treated by a doctor;

- the depression question has no temporal frame (i.e. duration, whether it occurred before or after gambling problems) and does not allow for meaningful comparisons;

- the suicide question would be better as two items: suicide ideation and suicide attempt;

- the sensitive nature of asking questions about suicide raises possibility that the interviewer might need to make a referral to assistance.

A summary of suggestions for the problem gambling correlates includes:

- examine fewer correlates, but in greater depth;

- remove the items on big wins and big losses;

- add items on dissociative status, emotion-seeking, social and environmental correlates, and harm to family, friends, and social function;

- develop better correlates for the progression of problem gambling;

- through further research, improve the correlates for problem gambling sub-types, particularly "moderate risk" and "problem gamblers";

- reconsider the self-attribution emphasis;

- add the wording "have you ever" to questions on personal alcohol and drug problems, depression, and suicide (25, 30 and 31);

- identify which family member have gambling or alcohol/drug problems;

- separate personal alcohol or drug problem into two questions;

- identify which drugs are involved in drug problems;

- add "stress problems that are not treated by a doctor";

- add temporal framing to the question on depression;

- split the item on suicide into ones addressing ideation and attempt;

- add the requirement to refer suicidal respondents for assistance.

Q2.7: Have any of the CPGI <u>Problem Gambling Correlates</u>, the variables or indicators, caused you any difficulty or concerns?

About half of the respondents indicated that the CPGI Problem Gambling Correlates caused them some difficulty or concern. Some believe the correlates insufficient and simplistic (e.g., alcohol and depression). Whereas some suggested that other correlates should be included, others thought it would be better to examine fewer correlates more thoroughly. Any changes to correlates should be informed by research and balanced with a number of questions.

Over and above responses to the previous question, there were comments about some specific areas of concern. One investigator suggested using the CAGE (a four-question screening instrument) to identify the presence of personal alcohol problems. It was recommended that

depression be defined in temporal terms (i.e., duration and/or onset in relation to gambling problems). One investigator suggested that depression be described as "lasting at least two weeks." Finally, another suggested that suicide be considered in relation to four categories: contemplating suicide, thinking of suicide, planning suicide and attempting suicide.

A summary of suggestions for difficulties and concerns regarding correlates includes:

- ensure correlates are informed by current research;
- balance correlate information with a number of questions;
- add new correlates;
- adding an item on impulse control;
- reduce the number of correlates and measure them more thoroughly;
- reconsider the faulty cognitions item that asks about the use of a system or strategy;
- use the CAGE to identify alcohol problems;
- use an established stress scale;
- define depression as lasting at least two weeks;
- expand the suicide question to include: contemplating, thinking, planning and attempting.

4.2.4 Demographics

The CPGI provides some questions on Demographics. These include 11 items that are covered in questions 32 to 42.

Q2.8: Did you use or would you use the CPGI <u>Demographics</u>?

About one third of the investigators, primarily those from Canada, used the CPGI Demographics. In introducing the Demographics Section of the CPGI, the User Manual states the following.

> Every researcher or survey research firm has their own way of asking these questions. These items are included more for reference purposes than because we expect them to be exactly replicated.

Clearly, most respondents selected to use their own demographic questions. In many cases, other questions were used in order to match other studies. Of those who used the CPGI demographics, there were very few problems reported. One respondent referred to the length of the questions on ethnicity and another suggested including a question on accumulated debt.

The implied and suggested improvements are listed below.

- Revisit the ethnicity questions to see if they can be shortened
- Consider including a question on accumulated debt
- Continue to permit researchers to use their own demographic items

4.3 Section 3: Reliability and Validity

As part of its development, the CPGI underwent testing for reliability and validity, and the review sought to gain current views on these properties. Reliability and validity are not independent, and some respondents did not always restrict their comments to one or the other.

4.3.1 Reliability

Q3.1: Five years since its introduction, what do you now think of the <u>Overall Reliability</u> of the CPGI in measuring gambling and problem gambling prevalence?

More than half the respondents are positive about the Overall Reliability of the CPGI in measuring gambling and problem gambling. The remainder either did not know or did not respond to the question. Most respondents have used the CPGI only once, and some have only used the PGSI. One had not conducted any independent analysis of reliability and could offer no opinion.

One of the strongest supporters stated that all tests and retests demonstrate good reliability and good alpha coefficients when used in conjunction with cohorts. One investigator indicated that findings are consistent across Canada, thereby indicating reliability. Another found good reliability between a pilot test and a prevalence survey, and in a test-retest with a special population of students. Finally, one indicated the CPGI has good internal reliability but test-retest scores show regression to the mean.

In reference to reliability, one respondent asked what it is we are measuring or capturing. Two others suggested that reliability is meaningless until the construct under study is better understood. In reference to the dynamic nature of problem gambling status, one respondent asked how you can you measure reliably when something is constantly changing: "there is nothing stable." There was general support for additional research into the reliability of the CPGI.

- Conduct more research on the reliability of the CPGI, including test retest and internal consistency studies

As mentioned above, there was a reliability and validity probe that was used repeatedly in Section 2: CPGI Components of the Core Questionnaire (see Questions Q2.1, Q2.3 through Q2.6). Whereas validity received more attention than reliability (see below), reliability concerns were addressed in some of the responses to other questions. There was considerable doubt about people being able to recall and estimate their gambling frequency, duration, and in particular, their spending or wagering. It was repeatedly suggested that people "don't know" "don't count" and "don't remember". A significant number of respondents consider the gambling involvement data to be unreliable and strongly suspect under-reporting and under-estimating. One suggested that the gambling involvement data might be "relatively" reliable but not "absolutely" reliable.

4.3.2 Validity

Q3.2:   Five years since its introduction, what do you now think of the <u>Overall Validity</u> of the CPGI in measuring gambling and problem gambling prevalence?

Over half the respondents are positive about the Overall Validity of the CPGI in measuring gambling and problem gambling. Most others either indicated they did not know or did not respond. Some respondents expressed "some concern" and two were clearly more negative than positive. As mentioned, most respondents have used the CPGI only once and some have used only the PGSI.

On the most positive side, respondents referred to the "face validity" of the instrument, the validity from the original testing, the comparative scores to related instruments, and the comparative review of instruments in Victoria, Australia mentioned earlier. One investigator reported good results from "exploratory" factor analysis conducted as part of a pilot test and subsequent prevalence survey data.

In relation to concerns, the CPGI was criticized for not being up-to-date with the "best understanding of gambling today" and the multiple pathways to problem gambling. One respondent described the validity properties as "confusing" because of the many estimation errors in the form of false positives and false negatives. This respondent referred to groups of known "heavy gamblers" who, when administered the CPGI, did not score as problem gamblers.

Additional doubts were expressed about the validity of the sub-types and cut-points. One respondent described the validity as "mixed" and suggest that some items might need to be weighted and the at-risk and moderate risk gambling groups need more work. A reasonably "confident" respondent on validity stated that the CPGI is state-of-the-art but problem gambling is a moving target and measurement instruments need to change with the changing knowledge. Another respondent indicated it is too early to test or expect validity because the field needs to understand the problem gambling construct first. There were a number of respondents who suggested the need for more research on the validity of the CPGI.

- Conduct research on the validity of the CPGI
- Conduct qualitative studies of all problem gambling sub-types: low risk gamblers, moderate risk gamblers and problem gamblers
- Conduct a meta study of all existing prevalence data
- Conduct more psychometric testing
- Conduct longitudinal studies

As mentioned above, there was a reliability and validity probe that was used repeatedly in Section 2: CPGI Components of the Core Questionnaire (see Questions Q2.1, Q2.3 through Q2.6). The validity issue received considerable attention in some of the responses to other questions. In response to other questions, the responses included the following observations. A few respondents wonder what is really being measured by the CPGI. These respondents wonder if the CPGI can be improved until the field has a better understanding of problem gambling and they consider the current construct of problem gambling to be a problem for the CPGI and a

problem for the field. Some respondents suggested the current construct, and the one underpinning the CPGI, does not adequately include the broad concept of harm as defined in Australia and does not include the family, friends, social context, workplace, environment, gambling environment (proximity and density of venues) and cultural norms. One respondent suggested that the current construct of problem gambling is based on psychological theories at the expense of social psychological and sociological perspectives.

A few respondents wonder if there are too many false positives and a couple of respondents suggested there are too many false negatives. In reference to false positives and, thereby, validity, it was noted that one published report indicates a large portion of problem gamblers identified in a prevalence study that used both the CPGI and the SOGS was not confirmed as problem gamblers or pathological gamblers through follow-up clinical assessments.

There were numerous concerns about the validity and empirical basis for all of the CPGI problem gambling sub-types: low risk gamblers, moderate risk gamblers and problem gamblers. Although the respondents appreciate the effort to identify low risk and moderate risk gamblers, there are serious questions about the soundness and empirical basis for the labels, categories and cut-points, which to some respondents seem unexplained and arbitrary. One respondent asked, who are the people the people in the problem gambling categories or problem gambling sub-types?

The validity of the differences and the cut-points between groups of gamblers was questioned (e.g., the differences between non-problem gamblers and low risk gamblers and the differences between low risk gamblers and moderate risk gamblers) One investigator suggested that low risk gamblers endorse low threshold items and he or she wonders if low risk gamblers have a problem. One respondent believes the low risk problem gambling group to be "bogus" and pointed out that there are important differences between lower scoring moderate risk gamblers and higher scoring moderate risk gamblers.

One respondent questioned the concept of risk being derived from the measurement of a few clinically gambling problems (i.e., does the endorsement of a clinical problem actually mean or equal a risk?). Given the common use of credit cards these days, the validity of the PGSI "problem" item on borrowing money was questioned. It was pointed out that the PGSI does not include any items that specifically address low or moderate severity. Some respondents suggested the inclusion of lower severity items and/or weighting items. Some respondents believe there might be fewer sub-types and others believe that there might be more (e.g., "extreme" or "severe" problem gambler). The validity of collapsing categories was questioned (e.g., for statistical power purposes, the moderate risk gamblers are frequently added to the problem gamblers).

It was pointed out that the PGSI includes borrowed items from other clinically derived instruments (DSM and SOGS), eight of the nine scored items are based on questions borrowed from the DSM and SOGS according to one respondent. It was suggested that within the PGSI gambling problems are measured by the same clinically derived measures of severity that it was expected to replace. It was further suggested that because of the borrowed items, the comparisons between the PGSI and the DSM and SOGS are not independent.

A few respondents consider the CPGI to be like other instruments, "no better, no worse." One respondent considers the CPGI to be "as good as" other instruments but hastened on to say that there is no "no gold standard" to measure problem gambling. The situation was eloquently summarized by one respondent who indicated that as an instrument to measure problem gambling, "The CPGI is state-of-the-art but the state-of-the-art is not very good."

4.4 Section 4: Administration Issues

Q4.1: Overall, what do you think of the efficiency and effectiveness of the <u>Administration</u> of the items and questions within the CPGI (<u>fielding</u> the questions and compiling responses)?

Almost all respondents think positively about the efficiency and effectiveness of the Administration of the items and questions within the CPGI. A few have been very close to the data collection and believe the instrument works very well, and does so in different formats: telephone interviews, face-to-face interviews and written responses (although the single postal survey had a very low return rate). A few respondents worry about the length of the gambling involvement section and large number of gambling activities covered. Suggestions for improvement include:

- shorten the gambling activities section;

- simplify the frequency, duration, and spending responses;

- improve the questions on spending;

- include questions on past gambling problems.

Q4.2: Are the questions easily understood?

More than two thirds of the respondents consider the CPGI questions to be easily understood. A few did not respond to the question but there were no negative responses. One pointed out that before its launch, the CPGI had been reviewed and set at a grade six reading level.

Q4.3: Are the responses easily acquired and compiled?

More than half of the respondents report that responses are easily acquired and compiled. The others either did not comment or respond to the question. It was generally agreed that the CPGI permitted easy coding and transfer for analysis.

4.5 Section 5: Comparison to Other Instruments

More than two thirds of the respondents have used comparable gambling measures. The most commonly used comparable instruments were the DSM and SOGS.

Q5.2: Have you attempted or made <u>Comparisons</u> of CPGI findings to those of other gambling and problem gambling measurements?

About two thirds of respondents report having made comparisons between CPGI findings and those of other gambling and problem measures. Through methods with varying degrees of sophistication, respondents report that the CPGI findings compare quite well to the DSM and SOGS findings. As mentioned, a comparison in Australia found the CPGI preferable to the Victorian Gambling Screen and the South Oaks Gambling Screen (SOGS).

4.6 Section 6: Additional Comments

Only seven respondents provided additional comments for improvement of the CPGI. These have been integrated into the appropriate sections of this report.

Q6.4: Do you know of any other CPGI prevalence studies in yours or other jurisdictions?

Respondents reported three new studies: Tasmania, Australia had recently posted a report on its population survey (see Inventory), New Mexico used the CPGI but the report has not yet been posted, and the forthcoming National Health Survey in New Zealand is expected to use the CPGI (New Zealand is also undertaking a cohort study that uses the CPGI).

A number of respondents identified and provided references of articles, presentations and reports that address issues related to the nature of problem gambling, the performance of gambling prevalence instruments and the performance of the CPGI. These references are available in Appendix D.

4.7 Conclusions

The Original Developers, Investigators, and Experts interviewed generally have a high regard for the CPGI. Overall, it is a well-used and well-regarded instrument, not only as the instrument of choice in Canada but also being used voluntarily in other countries.

The main conclusion drawn here is that as the first to be developed as a population prevalence instrument, the CPGI is sound and has performed well. It has matched or surpassed the performance of other instruments in measuring problem gambling, and is the first instrument to successfully describe categories or sub-types of gamblers and problem gamblers and to systematically measure the correlates of problem gambling. The CPGI has met its original objectives, performed well and it deserves continued use, even in its present form. Most respondents were of the view that the CPGI was the best available instrument and believed there were no superior alternatives.

Despite an overall positive view, respondents expressed some ambivalence about the CPGI. Most were critical of the absence of strong, on-going validation work, and many questioned whether the original validation still holds today. Moreover, most were of the view that much has been learned about the CPGI since its inception, and recognized it is time to introduce improvements.

Some respondents expressed the view that our understanding of gambling problems is so underdeveloped that *no* gambling instrument, including the CPGI, can be considered valid. They ask how we can measure something we don't understand. However, even the most critical researchers seem willing to continue to use the CPGI. In summary, the ambivalence is partly based on a knowledge-practice conflict best expressed by a respondent who noted, "The CPGI is state of the art, but the state of the art is not very good."

5. RECOMMENDATIONS

5.1 General Recommendations

1.   A rigorous program of psychometric research needs to assess: (i) the validity of the PGSI cut-off values and (ii) the potential benefits of weighting the PGSI items.

Virtually all respondents noted that the great strength of the PGSI, the most commonly used domain, was the ordinal problem typology generated by the scores. However, most also questioned the validity of the sub-types and cut-offs and recommended that (i) much more validation work needs to be done to confidently establish the PGSI cut-off values and, (ii) given the public health emphasis of the PGSI, more careful development should be undertaken to ensure that low risk, moderate risk and problem gambling groups are accurately captured. Indeed, some respondents had noted that in their work some PGSI items did not discriminate groups and that the items did not fit an interval scale. Moreover, there were variant views on whether the PGSI is over-estimating or under-estimating gambling problems. Some researchers have suggested that a sizeable percentage of gamblers scoring positive on the PGSI do not meet clinical diagnosis. More validation work is a critical need to the future development of the PGSI. A majority of respondents also suggested that more careful studies should evaluate whether weighting of PGSI items would improve its psychometric properties and the resulting sub-types.

2.   A formal review of the substantive appropriateness of the CPGI items and the PGSI sub-type labels should be undertaken.

Several respondents made important suggestions (e.g., revising the faulty cognition items, removing items on big wins and big losses, adding or deleting the non-scored problem gambling assessment items, including a measure of accumulated debt, etc.) that require more formal review by experts. In addition, some respondents have modified the PGSI sub-type labels in their work. Although such changes are likely a natural development of the field, they may also pose difficulties in understanding the results.

3a.   All CPGI items should be re-assessed for revisions that reduce respondent burden and difficulty.

Several respondents, including two prominent survey institutions – Statistics Canada and the Institute for Social Research – were of the view that many CPGI items could be improved by:

(i)   simplifying the gambling involvement items,
(ii)   reducing the number of response categories,
(iii)   ensuring that question stems are meaningfully related to response categories (e.g., insert "how often" when a frequency is being requested),
(iv)   ensuring that response categories are meaningful for the given item (e.g., many respondents noted awkward response scales to some items – "go-back" "always").

Although it is psychometrically preferable to have more than fewer response categories, the CPGI was designed for general population surveys in which the telephone would be the method most commonly employed, and one in which fewer response options (typically about 4) is preferable. In this regard, consideration should be given to revise items to move toward a "unimode" construction, items that provide similar distributions across different modes (Dillman, 2000).

3b. Standard screening strategies for involvement of gambling frequency and the PGSI should be evaluated, and a user recommendation should be developed.

A key issue related to telephone administration is the burden and difficulty in attempting to retain all gamblers through gambling involvement and PGSI items. There are no standard protocols, nor are recommendations provided by CPGI documentation. Filters used to eliminate unnecessary questioning have included: having spent at least $50, having gambled in past 12 months, or indicating "not gambled" responses during the PGSI administration. Strategies to reduce respondent burden, for example, identifying a small number of key or clustered gambling behaviours, could benefit the CPGI interview.

Recommendations 3a and 3b could be addressed by a well-designed split-ballot study that would (i) evaluate and test revisions to items, (ii) ensure that potential revisions do not negatively affect the psychometric properties of the domains, and (iii) ensure that screening filters do not negatively affect the performance of prevalence estimates.

4. Cognitive interview studies should be conducted to better understand the processes respondents' use in answering CPGI items.

Although pilot studies and actual data collection often identify problematic items, more qualitative cognitive interview studies could improve and, perhaps, reduce the number of CPGI items. Not surprisingly, items regarding duration and expenditures were frequently cited as problematic. This is not a reflection of the CPGI, but is a more general problem for collecting such complex data. In addition, several respondents questioned whether we truly understand respondent answers to some of the involvement and correlate items.

5. Longitudinal studies should be commissioned in order to better understand the progression of gambling problems and the stability of the PGSI typology.

Virtually all respondents indicated that longitudinal studies are critical to better understanding problem gambling. Most were of the view that little is known about the progression of gambling problems: what trajectories shift people into the different sub-types, and to what extent is sub-type membership a stable phenomenon? A few respondents wondered whether an emphasis on past year gambling has resulted in a weakened understanding of gambling and gambling problems over the life course.

6.   Strategies to increase CPGI methodological research and reporting in peer-reviewed publications should be implemented.

The majority of respondents believe that the CPGI is a state-of-the-art instrument, but many believe it is time for renewed and vigorous psychometric examination if it is to maintain this stature. Although the psychometric testing of the CPGI was state-of-the art in its time, newer methods – such as Latent Class Analysis, Mplus software, Item Response Theory -- have become more widely adopted and might further our understanding of the CPGI and its utility. Indeed, some respondents suggested that these newer methods could also be employed on the original data used to develop the CPGI. In addition, many respondents were of the view that too few studies have been published regarding the factor structure and the extent to which this structure might vary by sex, age group, and other demographics such as youth, ethnic background, Aboriginal status, etc.

One means of encouraging and supporting such secondary analysis could be to create an archive, perhaps housed at the Ontario Problem Gambling Research Centre, in which datasets employing the CPGI could be made available to respondents. Indeed, the OPGRC might consider encouraging data sharing of OPGRC-funded research as is now done by some major funding agencies. For example, the National Institutes of Health (NIH) notes the following:

> In NIH's view, all data should be considered for data sharing. Data should be made as widely and freely available as possible while safeguarding the privacy of participants, and protecting confidential and proprietary data. To facilitate data sharing, investigators submitting a research application requesting $500,000 or more of direct costs in any single year to NIH on or after October 1, 2003 are expected to include a plan for sharing final research data for research purposes, or state why data sharing is not possible.

7.   Consideration should be given that the CPGI enhance and develop items that could better assess population harm.

There was a view from several respondents that "harmful" gambling was being underestimated, given that few CPGI questions assess harm at the family, community, and other environmental levels. If the CPGI is to retain high public health utility it should fully captures harm that occurs beyond the individual gambler.

8.   For the CPGI to remain a state-of-the-art instrument, a Steering Committee should be developed to oversee the CPGI and its access to researchers; to review the instrument on a regular basis; and, to ensure the dissemination of revisions and standard protocols.

Many respondents noted that the activity of reviewing the CPGI was important and was one that should continue on a regular basis, as occurs with other instruments such as the DSM. As well, some researchers suggested that the CPGI User Manual be updated to reflect any revisions that are made to the CPGI and to describe any standard protocols that are developed for data

collection and data analysis. Most researchers do not use the CPGI demographics and they do not appear to be a necessary part of a prevalence instrument.

5.2 Final Comments

In addition to the above recommendations, the Research Team suggests that those considering them will benefit from a careful review the specific responses and suggestions included in the findings of this report. Likewise, it would be useful to review the additional references identified by the respondents and listed in Appendix D. With respect to periodic reviews and improvements of the CPGI, the Research Team suggests that the five-year interval between the initial launch and this review sets a good precedent for future reviews and improvements.

REFERENCES

Cox, Brian J., Yu, Nancy, Afifi, Tracy O. & Ladouceur, Robert (2005). A national survey of gambling problems in Canada. *Canadian Journal of Psychiatry.* 50(4), 213-217.

Dillman, D. A. (2000). *Mail and Internet Surveys: The Tailored Design Method* (2nd ed.). New York: Wiley.

Doiron, Jason & Nicki, Richard (1999). *The prevalence of problem gambling in Prince Edward Island*. Fredericton: University of New Brunswick.

Ferris, J. & Wynne, H. (2001a). *Draft – User manual*. Ottawa: Canadian Centre on Substance Abuse.

Ferris, J. & Wynne, H. (2001b). *The Canadian problem gambling index: Final report*. Ottawa: Canadian Centre on Substance Abuse.

Ferris, J., Wynne, H. & Single, E. (1999). *Measuring problem gambling in Canada: Final report – Phase I*. Ottawa: Canadian Centre on Substance Abuse.

Focal Research Consultants Ltd. (2001). *2001 Survey of gambling and problem gambling in New Brunswick*. Prepared for the New Brunswick Department of Health and Wellness. Fredericton: Government of New Brunswick.

Ipsos-Reid & Gemini Research (2003). *British Columbia problem gambling prevalence study: final report*. Prepared for the Ministry of Public Safety and Solicitor General. Victoria: Government of British Columbia.

Kavli, Hakon & Berntsen, Wenche (2005). *Gambling habits and gambling problems in the population*. Prepared for Norsk Tipping, the government gambling operator. Oslo: MMI Research.

Ladouceur, Robert, Jacques, Christian, Chevalier, Serge, Sevigny, Serge & Hamel, Denis (2005). Prevalence of pathological gambling in Quebec in 2002. *Canadian Journal of Psychiatry.* 50:(8), 451-456.

Ladouceur, Robert, Jacques, Christian, Chevalier, Serge, Sevigny, Serge, Hamel, Denis & Allard, Denis (2004). *Prevalence des habitudes de jeu et du jeu pathologique au Quebec en 2002*. Quebec et Montreal: Universite Laval et Institut national de sante publique du Quebec.

Market Quest Research Group Inc. (2005). *Newfoundland and Labrador gambling prevalence study*. St. John's: Department of Health and Community Services.

Marshall, Katherine & Wynne, Harold (2003). Fighting the odds. *Perspectives on Labour and Income*. (Statistics Canada, Catalogue No. 75-001-XIE) 4(12): December 5-13.

McMillen, Jan, Marshall, David, Ahmed, Eliza & Wenzel, Michael (2004). *2003 Victorian longitudinal community attitudes survey*. Canberra: The Centre for Gambling Research, Australian National University.

Olason, Daniel Thor, Barudottir, Sigridur Karen & Gretarsson, Sigurdur J. (2005). *Prevalence of gambling participation and pathological gambling among adults in Iceland: Results from a national survey*. Reykjavik: Department of Psychology, Faculty of Social Science, University of Iceland.

Patton, David, Brown, David, Dhaliwal, Jaste, Pankratz, Curt & Broszeit, Brian (2002). *Gambling involvement and problem gambling in Manitoba*. Winnipeg: Addictions Foundation of Manitoba.

Queensland Treasury (2001). *Queensland household gambling survey 2001*. Brisbane: Queensland Government.

Queensland Treasury (2005). *Queensland household gambling survey 2003-04*. Brisbane: Queensland Government.

Roy Morgan Research (2006). *The fourth study into the extent and impact of gambling in Tasmania with particular reference to problem gambling: Follow-up to the studies conducted in 1994, 1996 and 2000*. Hobart, Tasmania: Gambling Support Bureau, Human Services and Housing Division, Department of Health and Human Services.

Schrans, Tracy, Schellinck, Tony & Focal Research Consultants (2004). *2003 Nova Scotia gambling prevalence study*. Prepared for the Office of Health Promotion, Addictions Services. Halifax: Nova Scotia Health Promotion.

Smith, Garry J., & Wynne, Harold J. (2002*). Measuring gambling and problem gambling in Alberta using the Canadian Problem Gambling Index (CPGI): Final report*. Edmonton: Alberta Gaming Research Institute.

Stinchfield, Randy (2000). "Gambling and Correlates of Gambling among Minnesota Public School Students." *Journal of Gambling Studies*. 16 (2/3): 153-173.

Wiebe, Jamie, Cox, Brian & Falkowski-Ham, Agata (2003*). Psychological and social factors associated with problem gambling in Ontario: A one year follow-up study*. Toronto: Responsible Gambling Council.

Wiebe, Jamie, Single, Eric & Falkowski-Ham, Agata (2001). *Measuring gambling and problem gambling in Ontario*. Toronto: Canadian Centre on Substance Abuse and Responsible Gambling Council.

Wynne, Harold J. (2002). *Gambling and problem gambling in Saskatchewan: Final report.* Ottawa: Canadian Centre on Substance Abuse.

Wynne, Harold J. (2003). *Introducing the Canadian problem gambling index.* Edmonton: Wynne Resources.

APPENDIX A

Inventory of CPGI Studies

Canadian Prevalence Studies

National:

Marshall, Katherine & Wynne, Harold (2003). Fighting the odds. Ottawa: Statistics Canada, Catalogue 75-001-XIE. *Perspectives on Labour and Income,* 4:(12), 5-13.

Cox, Brian J., Yu, Nancy, Afifi, Tracy O. & Ladouceur, Robert (2005). A national survey of gambling problems in Canada. *Canadian Journal of Psychiatry*, 50:(4), 213-217.

Provincial:

British Columbia

Ipsos-Reid & Gemini Research (2003). British Columbia problem gambling prevalence study: Final report. Prepared for the Ministry of Public Safety and Solicitor General. Victoria: Government of British Columbia.

Alberta

Smith, G.J., & Wynne, H.J. (2002). *Measuring gambling and problem gambling in Alberta using the Canadian Problem Gambling Index (CPGI): Final report.* Edmonton: Alberta Gaming Research Institute.

Saskatchewan

Wynne, H.J. (2002). *Gambling and problem gambling in Saskatchewan: Final report.* Ottawa: Canadian Centre on Substance Abuse.

Manitoba

Patton, David; Brown, David; Dhaliwal, Jaste; Pankratz, Curt & Broszeit, Brian (2002). *Gambling involvement and problem gambling in Manitoba.* Winnipeg: Addictions Foundation of Manitoba.

Ontario

Wiebe, Jamie; Single, Eric; & Falkowski-Ham, Agata (2001). *Measuring gambling and problem gambling in Ontario.* Toronto: Canadian Centre on Substance Abuse and Responsible Gambling Council (Ontario).

Quebec

Ladouceur, Robert; Jacques, Christian; Chevalier, Serge; Sevigny, Serge; & Hamel, Denis (2005). Prevalence of pathological gambling in Quebec in 2002. *Canadian Journal of Psychiatry,* 50:(8), 451-456.

Ladouceur, Robert; Jacques, Christian; Chevalier, Serge; Sevigny, Serge; Hamel, Denis & Allard, Denis (2004). *Prevalence des habitudes de jeu et du jeu pathologique au Quebec en 2002*. Quebec et Montreal: Universite Laval et Institut national de sante publique du Quebec.

New Brunswick

Focal Research Consultants Ltd. (2001). *2001 Survey of gambling and problem gambling in New Brunswick*. Prepared for the New Brunswick Department of Health and Wellness. Fredericton: Government of New Brunswick.

Prince Edward Island

Doiron, Jason & Nicki, Richard (1999). *The prevalence of problem gambling in Prince Edward Island*. Fredericton: University of New Brunswick.

Nova Scotia

Schrans, Tracy; Schellinck, Tony; & Focal Research Consultants (2004). *2003 Nova Scotia gambling prevalence study*. Prepared for the Office of Health Promotion, Addictions Services. Halifax: Nova Scotia Health Promotion.

Newfoundland and Labrador

Market Quest Research Group Inc. (2005). *Newfoundland and Labrador gambling prevalence study*. Prepared for the Department of Health and Community Services. St. John's: Government of Newfoundland and Labrador.

International Prevalence Studies

Iceland

Olason, Daniel Thor; Barudottir, Sigridur Karen; & Gretarsson, Sigurdur J. (2005). *Prevalence of gambling participation and pathological gambling among adults in Iceland: Results from a national survey*. Reykjavik: Department of Psychology, Faculty of Social Science, University of Iceland.

Norway (discovered during scan, replaced Denmark)

Kavli, Hakon & Berntsen, Wenche (2005). *Gambling habits and gambling problems in the population*. Prepared for Norsk Tipping, the government gambling operator. Oslo: MMI Research.

Queensland, Australia

Queensland Treasury (2005). *Queensland household gambling survey 2003-04*. Brisbane: Queensland Government.

Queensland Treasury (2001). *Queensland household gambling survey 2001*. Brisbane: Queensland Government.

Victoria, Australia

McMillen, Jan; Marshall, David; Ahmed, Eliza; & Wenzel, Michael (2004). *2003 Victorian longitudinal community attitudes survey*. Canberra: The Centre for Gambling Research, Australian National University.

Tasmania, Australia (discovered during review, not included in review)

Roy Morgan Research (2006). *The fourth study into the extent and impact of gambling in Tasmania with particular reference to problem gambling: Follow-up to the studies conducted in 1994, 1996 and 2000*. Hobart, Tasmania: Gambling Support Bureau, Human Services and Housing Division, Department of Health and Human Services.

APPENDIX B

KEY INFORMANTS AND PREVALENCE STUDIES

There were 20 Key Informant interviews and 21 of 24 Key Informants were interviewed (one person was interviewed for two categories): 3 of 4 Original Developers, 9 of 11 Canadian Principal Investigators (one person that was not interviewed was the Principal Investigator for two provinces), 2 Other Investigators, 4 international Principal Investigators and 3 Gambling Prevalence Experts.

ORIGINAL DEVELOPERS

Jackie Ferris (principal author on all three reports)

Harold Wynne (author on all three reports and was interviewed as an Original Developer and a Principal Investigator for the Saskatchewan study)

Nigel Turner (consultant on the Phase II report)

Robert Ladouceur (consultant on Phase II report but interviewed as a Principal Investigator for Quebec survey)

Randy Stinchfield (consultant on Phase II report but interviewed as a Gambling Prevalence Expert)

PRINCIPAL INVESTIGATORS AND OTHER INVESTIGATORS

15 of 17 Key Informants were interviewed as Principal Investigators and Other Investigators: 9 of 11 Principal Investigators of Canadian studies, 2 Other Investigators of Canadian studies and 4 Principal Investigators of international studies were interviewed:

CANADIAN PREVALENCE STUDIES

NATIONAL

Principal Investigator: Katherine Marshall (replaced by Ronald Gravel)

Marshall, Katherine & Wynne, Harold (2003). Fighting the odds. Ottawa: Statistics Canada, Catalogue 75-001-XIE. *Perspectives on Labour and Income,* 4:(12), 5-13.

PROVINCIAL

British Columbia

Principal Investigator: Rachel A. Volberg

Ipsos-Reid & Gemini Research (2003). *British Columbia problem gambling prevalence study: final report*. Prepared for the Ministry of Public Safety and Solicitor General. Victoria: Government of British Columbia.

Alberta

Principal Investigator: Garry J. Smith

Smith, G.J. & Wynne, H.J. (2002). *Measuring gambling and problem gambling in Alberta using the Canadian Problem Gambling Index (CPGI): Final report*. Edmonton: Alberta Gaming Research Institute.

Saskatchewan

Principal Investigator: Harold J. Wynne (interviewed as an Original Developer)

Wynne, H.J. (2002). *Gambling and problem gambling in Saskatchewan: Final report*. Ottawa: Canadian Centre on Substance Abuse.

Manitoba

Principal Investigator: David Patton

Patton, David, Brown, David, Dhaliwal, Jaste, Pankratz, Curt & Broszeit, Brian (2002). *Gambling involvement and problem gambling in Manitoba*. Winnipeg: Addictions Foundation of Manitoba.

Ontario

Principal Investigator: Jamie Wiebe

Wiebe, Jamie, Single, Eric & Falkowski-Ham, Agata (2001*). Measuring gambling and problem gambling in Ontario*. Toronto: Canadian Centre on Substance Abuse and Responsible Gambling Council (Ontario).

Quebec

Principal Investigator: Robert Ladouceur

Second Investigator: Christian Jacques

Third Investigator: Serge Chevalier

Ladouceur, Robert, Jacques, Christian, Chevalier, Serge, Sevigny, Serge & Hamel, Denis (2005). Prevalence of pathological gambling in Quebec in 2002. *Canadian Journal of Psychiatry,* 50:(8), 451-456.

Prince Edward Island

Principal Investigator: Jason Doiron

Doiron, Jason & Nicki, Richard (1999). *The prevalence of problem gambling in Prince Edward Island.* Fredericton: University of New Brunswick.

Newfoundland and Labrador

Principal Investigator: Carolyn O'Keefe (and Heather Legg)

Market Quest Research Group Inc. (2005). *Newfoundland and Labrador gambling prevalence study.* Prepared for the Department of Health and Community Services. St. John's: Government of Newfoundland and Labrador.

INTERNATIONAL PREVALENCE STUDIES

Iceland

Principal Investigator: Daniel Thor Olason

Olason, Daniel Thor, Barudottir, Sigridur Karen & Gretarsson, Sigurdur J. (2005). *Prevalence of gambling participation and pathological gambling among adults in Iceland: Results from a national survey.* Reykjavik: Department of Psychology, Faculty of Social Science, University of Iceland.

Norway (replaced Denmark)

Principal Investigator: Hakon Kavli

Kavli, Hakon & Berntsen, Wenche (2005). *Gambling habits and gambling problems in the population.* Prepared for Norsk Tipping, the government gambling operator. Oslo: MMI Research

Queensland, Australia

Principal Investigators: David Marshall (and Anneke Schmider)

Queensland Treasury (2005). *Queensland household gambling survey 2003-04.* Brisbane: Queensland Government.

Victoria, Australia

Principal Investigator: Jan McMillen

McMillen, Jan, Marshall, David, Ahmed, Eliza & Wenzel, Michael (2004). *2003 Victorian longitudinal community attitudes survey.* Canberra: The Centre for Gambling Research, Australian National University.

GAMBLING PREVALENCE EXPERTS

Three (3) Key Informants were interviewed as Gambling Prevalence Experts:

Henry Lesieur

Randy Stinchfield

John Pollard*

Jan McMillen (expert and Principal Investigator: Victoria, Australia)

Rachel Volberg (expert and Principal Investigator: British Columbia)

* John Pollard of the Institute for Social Research at York University has used the CPGI for two surveys and was interviewed as an Expert on the administering the CPGI and conducting telephone surveys using prevalence instruments and questionnaires.

APPENDIX C
Additional References suggested by Respondents

Blaszczynski, A., Dumlao, V. and Lange, M. (1997). "How much do you spend gambling?" Ambiguities in survey questionnaire items. *Journal of Gambling Studies*, 13(3), 237-252.

Blaszczynski, Alex & Nower, Lia (2002). A pathways model of problem and pathological gambling. *Addiction*, 97(5), 487.

Chevalier, Serge (2004). *Depenses et problemes de jeu au Quebec: Note de recherché.* Direction de sante publique de Montreal.

Chevalier, Serge, Allard, Denis and Kimpton, Marie-Anne (unpublished). *Negative public health impacts related to electronic gambling machines*. Institute national de sante publique Quebec.

Chevalier, S., Montpetit, C., Biron, J.F., Dupont, M.A. et Caux, C. (2006). *Avis sur la modification de l'offre de jeu a Montreal: La construction d'un casino au bassin Peel.* An advice paper. Direction de sante publique de Montreal.

Currie, S. R., Hodgins, D. C., Wang, J., el-Guebaly, N., Wynne, H. & Chen, S. (2006). Risk of harm among gamblers in the general population as a function of level of participation in gambling activities. *Addiction,* 101(4), 570-580.

Gambino, B. (1999). An epidemiologic note on verification bias: Implications for estimation of rates. *Journal of Gambling Studies*, 15(3), 223-232.

Ladouceur, Robert, Jacques, Christian, Chevalier, Serge, Sévigny, Serge & Hamel, Denis (2005). Prevalence of pathological gambling in Quebec in 2002. *Canadian Journal of Psychiatry, 50*, 451-456.

Lesieur, Henry R. (1994). Epidemiological surveys of pathological gambling: Critique and suggestions for modification. *Journal of Gambling Studies*, 10(4), 385-398.

Maitland, Scott B. & Adams, Gerald R. (2006). *Assessing the factor structure of the Canadian Problem Gambling Index: Does qualitative stability allow quantitative comparison?* A report prepared for the Ontario Problem Gambling Research Centre. Guelph: University of Guelph.

McMillen, Jan & Wenzel, Michael (2004). *Evaluating Three Problem Gambling Screens: SOGS, VGS and CPGI.* Presented to the National Association for Gambling Studies (NAGS) 14th Conference, Striking a Balance. Gold Coast, 11-13th November 2004.

McMillen, Jan & Wenzel, Michael (in print). Measuring problem gambling: Assessment of three prevalence screens. *International Gambling Studies*, 6(2).

Neal, Penny, Delfabbro, Paul & O'Neil, Michael (2005). *Problem gambling and harm: Towards a national definition*. Melbourne, Victoria, Australia: Office of Gaming and Racing, Victorian Government Department of Justice.

Ólason, Daníel Þór, Finnbogadóttir, Herdís, Hauksdóttir, Margrét Aðalheiður og Bárudóttir, Sigríður Karen (2003). *An Icelandic version of the Problem Gambling Severity Index: A psychometric evaluation*. A paper presented in the 27th Nordic Psychiatric Congress, Reykjavik, Iceland.

Olason, D.T., Barudottir, S.K. & Gretarsson, S.J. (2006). *Prevalence of gambling participation and problem gambling among adults in Iceland: Results from a national survey*. A paper presented at the13th International Conference on Gambling and Risk Taking, 22-26 May, Harrah's Lake Tahoe.

Stinchfield, Randy, Govoni, Richard & Frisch, G. Ron (2001). *An evaluation of diagnostic criteria for pathological gambling: An assessment of the reliability, validity and classification accuracy of DSM-IV criteria and the development of the new signs and symptoms of pathological gambling*. A report prepared for the Ontario Substance Abuse Bureau. Windsor: Problem Gambling Research Group, University of Windsor.

Strong, D. R., Lesieur, H. R., Breen, R. B., Stinchfield, R. & Lejuez, C. W. (2004). Using a Rasch model to examine the utility of the South Oaks Gambling Screen across clinical and community samples. *Addictive Behaviors*, 29, 465-481.

Toce-Gerstein, Marianna, Gerstein, Dean R. & Volberg, Rachel A. (2003). A hierarchy of gambling disorders in the community. *Addiction,* 98, 1661-1672.

Volberg, R.A., Gerstein, D.R., Christiansen, E.M. & Baldridge, J. (2001). Assessing self-reported expenditures on gambling. *Managerial and Decision Economics*, 22(1-3), 77-96.