Phase II Self Administered Problem Gambling Screen
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Executive Summary

The purpose of this report is to assess and modify the SAPGS as tested in Phase II of the SAPGS project. The analysis is based on data collected by Market Solutions of Melbourne Australia. This firm is preparing a separate report primarily based on qualitative data collected at the same time. These data were collected during the screening and in-depth interview phases of the survey. The sample consists of 91 gamblers recruited at establishments that offer machine gambling in Victoria. Respondents had to have been active gamblers but could not have been gambling for more than two years. The focus was on newcomers as the primary purpose of the SAPGS is to help these gamblers avoid becoming problem gamblers.

The analysis generated exciting results that help validate the SAPGS multi-screen, three category design. As well, it suggests changes to the sub screens that should substantially improve its accuracy in identifying no risk, at-risk and problem gamblers. This analysis was able to show that the SAPGS is likely superior to other screens in identifying gamblers who are in the process of becoming problem gamblers but who have not yet felt the negative impacts of their behaviour.

Results

The Sub Screens

> **Beliefs** – This screen proved to be a relatively poor predictor of either problem or at-risk gamblers as defined by the CPGI. However, it was decided that it was best to keep this sub screen in the SAPGS as it is still possible that improving people's knowledge of gambling could help them avoid problem gambling and the inclusion of the screen only marginally reduced the power of the SAPGS.
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> It is recommended that three new statements be substituted for three tested statements. These new statements overcome shortcomings in the tested statements that became more obvious once the responses to the screen were analysed. The sub screen will continue to have five statements and require agreement on three or more statements in order for the screen to indicate that the gambler may be at risk on this dimension.
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> It is interesting to note that many responsible gambling campaigns rely on educating the gambler concerning their misconceptions regarding how the pokies work and debunking the gambler's fallacy, yet the evidence here suggests that correcting these erroneous beliefs may have little impact. It

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may be better for these campaigns to focus on the motives and behaviours of gamblers rather than their beliefs.

Motives – The motivation sub screen as tested had fourteen statements and required agreement on three or more of the statements in order for there to be an indication of risk. The new data allowed for analysis to eliminate ineffective statements and adjust the cut-off level. In the end six statements were dropped leaving the motive sub screen with eight statements and agreement required on two or more statements for an indication of risk. The revised sub screen is superior in predicting the at-risk and problem gamblers identified using the CPGI and now it has the same cut-off as the other screens, except for the beliefs sub screen which remains at 3+.

Gambling Behaviours – This screen also proved to be very predictive of CPGI problem gamblers. The excellent discrimination power was such that the cut-off was reduced from agreement with four or more statements to agreement with two or more statements. One statement was also dropped from the screen without affecting the power of the screen, bringing the number of statements down to six.

Physiological and Emotional Response – This sub screen as tested had six statements and a cut-off of agreement with two or more statements. One statement was dropped from the screen leaving a screen with five statements and a cut-off of two or more agreed to statements.

Torment – Overall this sub screen was correlated well with the CPGI for both samples. However, the wording of one statement was changed in order to reduce the percent of respondents agreeing with it.

Impact – This sub screen was found to be highly predictive and discriminating with regard to the CPGI categories and as a result was left unchanged.

The Self Administered Problem Gambling Screen

The overall predictability of the SAPGS was evaluated after dropping the statements in those screens as recommended above. The overall SAPGS score, based on the number of positive screens was reasonably correlated with the CPGI score (.67). Four of the individual screens showed strong convergent validity with correlations ranging from .66 up to .79 with the CPGI score. The beliefs screen was only correlated at the .21 level but was kept for reasons stated above. The physiological and emotional response screen was only correlated .56, but this screen proved to be effective in helping isolate problem gamblers from at-risk gamblers and since the CPGI does not measure these types of impacts it was reasonable to expect a lower correlation.

The SAPGS has four levels of assessment:
1. No agreement with any statement – non-risk gamblers
2. Agreement to any statement in the screens – the gambler is warned that they may have misconceptions or be playing for the wrong reasons, etc., depending on the nature of the sub screen.

3. If the gamblers tested positive on one or two of the sub screens they are informed that they are at risk and it suggested that they need to change their thinking and play behaviours with regard to pokie play. If they would like help they can call the help line.
4. If they test positive on three or more sub screens there are told they should be concerned, think about changing their gambling habits and to seek assistance from family, friends and the gambling help line.

The screen does not label them as problem gamblers but does provide the appropriate actions given the results of their test. The reason I point out these levels is that the analysis was focused on proving that they are valid.

Underlying this structure of six sub screens is the assumption that erroneous beliefs and motives lead to problematic gambling behaviour which in turn leads to harmful impacts and therefore, a problem gambler. If this is true we would expect that gamblers who are at the pre-problem gambling stage would test positive on the beliefs, motives and behaviours sub screens and not on the three impact sub screens. Finding these results would indicate that the SAPGS is likely effective in identifying those who are on their way to becoming problem gamblers but have not yet created the harm to themselves or family.

The analysis supports the underlying assumption, where 88% of the positive screens for the at-risk gamblers are the three pre-impact (beliefs, motives and behaviour) screens. Conversely, only 4% of the positives on the three impact screens were from the at-risk sample, the remaining 96% were from the problem gamblers, those who tested positive on three or more screens. The SAPGS therefore does two things extremely well, it identifies relatively new gamblers who are likely on their way to becoming problem gamblers and it does so with incredible discriminating power using the 0, 1-2, 3+ cut-off points for the summed positive screens.

Added to this is the fact that the SAPGS design provides these at-risk gamblers with a clear indication of where their problem lays the first step to changing their behaviours.

A final analysis of the SAPGS adjusted the sample for frequency bias which is inherent in any on-site survey. Frequent visitors to the site are much more likely to be recruited, thus frequent gamblers are over sampled. While this bias worked in our favour by allowing us to recruit more at-risk and problem gamblers, the resulting statistics are not necessarily representative of all gamblers, and of those who would over the course of time be using the screen. The sample was therefore weighted in such a way as to compensate for this bias and some revised statistics produced.

What was learned is that the largest segment of those who take the screen are likely to be categorized as no risk gamblers, the smallest segment is likely to be those who are experiencing harmful effects from their gambling (they comprised 51% of the original sample). As well, those at risk make up a substantial proportion, roughly a third of those likely to take the screen.

In summary, the Victoria Department of Justice can be assured that the screen developed is extremely powerful and effective in meeting its goal of identifying at-risk and problem gamblers.

Professionals who will be talking to the gamblers after they have taken the screen, including doctors, counsellors and those on the gambling help line need to be appraised of the power and value of the this screen so that they are confident in basing their assistance on its results. They need to be trained on how to take advantage of it, rather than relying on traditional screens such as the CPGI or DSM IV which are not as useful for identifying at-risk gamblers (the CPGI categorizes anybody as at-risk if the score one to two, or three to seven using all the statements, not just the pre-impact statements, it is therefore less reliable in identifying at-risk gambles in their early stages).

In particular, the at-risk gamblers will not yet be exhibiting the harmful effects found in the traditional problem gambler. Methods need to be developed that deal specifically with a gambler at this stage of problem development. They may be less motivated to change their behaviours as they have yet to experience the harmful effects. Aid to these people may be in the form of educating them as to the long term potential for harm from continued problematic behaviours.

In general, the new screen allows for new solutions and these need to be developed in order for the SAPGS to realize its full potential.

Main Report

The primary purpose of this phase of the research was to examine qualitatively the value of the draft screen and brochure created in phase I of the project.

The Data

These analyses use data collected by Market Solutions of Melbourne Australia in completing a qualitative analysis of the draft brochure from Phase 1 of the study. Ninety-one respondents recruited at gambling venues were invited complete an in-depth interview at an offsite location. During this interview the respondents were exposed to the brochure and asked to fill out the screen contained in it. During the recruiting stage of the study, while in the venue, the respondents were administered the Canadian Problem Gambling Index screen and these data were also analysed for this report.

CPGI Screen

As the CPGI is used as a benchmark in order to assess the convergent validity of the SAPGS it was felt that a brief description and analysis of the CPGI as measured in this survey be presented. The CPGI is composed of nine items listed below.
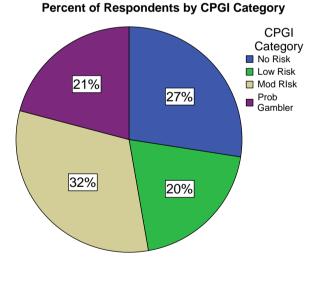
Thinking about the past twelve months………
1. Have you bet more than you really could afford to lose?
2. Have you needed to gamble with larger amounts of money to get the same feeling of excitement?
3. When you gambled, did you go back another day to try and win back the money you lost?
4. Have you borrowed money or sold anything to get money to gamble?
5. Have you felt that you might have a problem with gambling?
6. Have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?
7. Have you ever felt guilty about the way you gamble, or what happens when you gamble?
8. Has gambling caused you any health problems, including stress or anxiety?
9. Has your gambling caused any financial problems for you or your household?

To score the CPGI, the nine items are summed to arrive at a total score ranging from 0 to 27, and interpreted using the following risk continuum:

There are four possible responses to each statement; never (scored as 0), sometimes (scored as 1), most of the time (scored as 2), and almost always (scored as 3). The scores are summed to provide a total score ranging from 0 to 27. Those scoring 0 are non-problem or no risk gamblers, those scoring 1 and 2 are considered low risk gamblers, a score of 3 - 7 designates them as a moderate risk gambler and a score of 8+ designates them as a problem gambler.

Table 1 – Correlations of CPGI Statements with SAPGS Sum of Indications

	% Scoring 1 or more on the CPGI Statement	Correlation with SAPGS Sum Score N = 91
CPGI Sum Score	72%	.67
1. Have you bet more than you really could afford to lose?	56%	.43
2. Have you needed to gamble with larger amounts of money to get the same feeling of excitement?	38%	.52
3. When you gambled, did you go back another day to try and win back the money you lost?	45%	.57
4. Have you borrowed money or sold anything to get money to gamble?	21%	.48
5. Have you felt that you might have a problem with gambling?	35%	.54
6. Have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?	36%	.49
7. Have you ever felt guilty about the way you gamble, or what happens when you gamble?	55%	.55
8. Has gambling caused you any health problems, including stress or anxiety?	24%	.54
9. Has your gambling caused any financial problems for you or your household?	23%	.51

Percent of Respondents by CPGI Category

CPGI Category
- No Risk
- Low Risk
- Mod RIsk
- Prob Gambler

No Risk 27%
Low Risk 20%
Mod RIsk 32%
Prob Gambler 21%

The CPGI screen indicates that over half the sample is comprised of moderate risk or problem gamblers. This may come as a surprise to some that so many gamblers are near or at a problem state. However, this is a common finding based on the sampling procedure which sample people at the venue. The fact is problem gamblers often make up to half the gamblers in front of the machines at any given time (this has been observed in all jurisdictions in which I have conducted research and includes casinos). I purposely had Research Solutions recruit on site as we needed a good mixture of gamblers in the four categories and that is exactly what we achieved. This is an excellent sample then to analyse the effectiveness of the SAPGS in classifying gamblers according to the four CPGI categories.

It should be noted that if a random sample of gamblers were collected outside the venue then the proportion of problem gamblers would be far less as non-problem and low risk gamblers gamble at the establishments far less frequently and were therefore

less likely to be included in our sample and are under-represented. At the end of this report I conduct analysis to examine the profile of gamblers when the sample has been adjusted for this frequency bias.

The CPGI deals almost entirely with the harmful impacts of gambling. Question 1 concerns losing too much money, statement 4 implies financial difficulties, statement 5 asks about problem gambling, and statements 6 through 9 deal with other harmful effects frequently associated with problem gambling. Only question 3 deals with gambling behaviour (chasing) and frankly I'm not sure what question 2 is really assessing and I find it hard to believe a gambler can answer the question accurately. The underlying philosophy of this screen is that gambling must be causing harm at least occasionally before a gambler could be assessed to be at risk. The early warning aspect of this screen is that these impacts only occur sometimes, but if any one or two occur frequently then the gambler is designated as moderate risk or is a problem gambler.

Since this screen is primarily an impact based measure that ignores beliefs, motives and (except for question 3) gambling behaviours. It is based on a different philosophy than is the SAPGS which assumes that people who are at risk can be identified before they are harmed. However, as the CPGI seems to be the standard by which other screens can be compared, I have used it, and its four categories, to compare with the SAPGS in order to assess convergent validity.
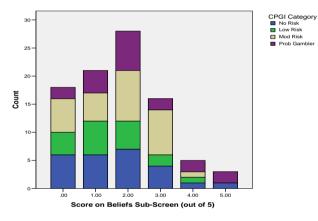
Analysis of the Sub Screens

The Beliefs Sub Screen

There were five belief statements in this sub screen as tested:

What you believe to be true when you gamble.
- Some gamblers are lucky enough to win at pokies over the long run.
- After a string of losses I sometimes believe that my chances of beating the pokies over the next while will improve.
- More skilled pokie players win more often.
- A near miss means the machine may pay out big soon.
- In the long run some people can win at pokie play.

Respondents could score from 0 to five on this sub-screen by selecting those statements with which they agreed. The graphs below shows that only eighteen of the ninety-one respondents correctly disagreed with all of the statements while the mode was two statements agreed to. If erroneous beliefs are associated with problem gambling and greater risk then one would expect to see the problem gamblers comprising those who agree to more of these statements. Conversely those who are

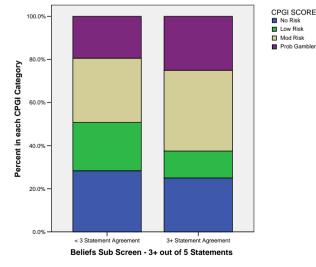not at risk should agree to relatively few of the statements. As can be seen from the graph to the left, and the fact that the two measures (CPGI score and the beliefs sub-screen sum) are barely correlated at .21 (p=.05), erroneous beliefs are not strongly associated with at-risk or problem gamblers.

The graph to the left shows the CPGI category distribution for those who tested positive on this screen and those who did not. The two distributions are almost identical, with only slight shifts toward more problem and moderate risk gamblers found in the positive sample. As will be seen below, the other screens do markedly better in separating the moderate risk and problem gamblers from the other gamblers.

Table 2 – Correlations of Belief Statements with CPGI Score

	% Agreeing to the statement	Correlation with CPGI Sum Score N = 91	Correlation with CPGI Sum Score PG Excluded N = 72
Sum Score of Beliefs Sub Screen		.21	NS
1. Some gamblers are lucky enough to win at pokies over the long run	40%	NS	NS
2. After a string of losses I sometimes believe that my chances of beating the pokies over the next while will improve	43%	NS	NS
3. More skilled pokie players win more often	19%	NS	NS
4. A near miss means the machine may pay out big soon	30%	.25	NS
5. In the long run some people can win at pokie play.	45%	NS	NS

Table 2 present three sets of results. The first column indicates the percent of the ninety-one respondents who agreed with the statement. If this is very low, say 10% or less for this sample than its ability to identify the problem gambles is limited as problem gamblers and moderate risk gamblers make up over 50% of this sample. If it is very high, say 70% of more, than it may be capturing too many none or low risk gamblers who are agreeing to the statement. Also, if too many people are agreeing to a statement that should be incorrect then it will be examined to see if there are elements of truth in it that would negate its appropriateness as an item in this screen.

The second column presents the correlation of the CPGI score which can range from 0 to 27, with the binary variable of agreement with each statement. The primary purpose of this analysis is not to asses the actual strength of association but to find which statements are more strongly associated with the CPGI in order to help asses which statements to keep. I have therefore included in the table correlations that are significant at the $p < .10$ level or better, unless otherwise noted in the table.

The third column is the same as the second except that I removed the nineteen problem gamblers from the sample in order to analyse the relationship between the sub screen and the probability of being a moderate risk gambler. Those remaining have scores ranging from 0 to 7 on the CPGI. I wanted to ensure that statements that had predictive power with the moderate risk gamblers would be retained in the screens. It is interesting to note that in some screens, statements that did not correlate highly for the total sample did for the sample with problem gamblers removed.

Only the belief statement concerning near misses was found to be associated with problem gambling ($r = .25$) and only for the full sample. These results suggest that there may be problems with the statements:

1. The statements should not refer to "people" or "gamblers" as the respondent can probably remember examples or has heard from others of people who have defied the odds and won over the long run. The statements would be improved if they referred to the gambler's own play and experiences. This would suggest statements 1, 3 and 5 need to be modified.

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2. Statements 1 and 5 address the same issue.
3. Other false beliefs may be more closely related to problem gambling.

With 40% and 45% of gamblers agreeing to the first and last statements that suggest that pokie players can win in the long run, these statements need to be revised and or replaced. Research into machine data that tracks gambling behaviour has found that some people can win at the machines over a six month or even a year's time, depending on their frequency of play. In the long run they all lose, but the amount of time they are ahead could last a year or more, and many pokie players may know somebody like this.

I recommend that the statement below be substituted for the first statement.

1. I feel that over time I can come out ahead playing the pokies.

This statement should be superior to the tested one as it deals specifically with the persons' own chances of winning over the long run. A belief about their own chances of winning should be more likely to influence their own behaviour. This should also reduce the number of people agreeing to the statement.

The statement below should be substituted for the third statement in the screen.

3. I feel I can improve my chances of winning at the pokies by using certain strategies or betting systems.

Similar to the statement it is replacing, this statement deals with skill/strategies and systems, but refers to the person's own beliefs and not the experience of other gamblers. In Nova Scotia this statement is now true as I believe the operators have changed their games such that the payout rate is a function of the bet rate. Those who are betting at higher rates on the machine enjoy a higher payout rate. Thus one strategy for winning more often is to play the max bet each spin/game. (Playing max bet has been found to be associated with problem gambling in Nova Scotia, but that does mean that encouraging people to play at that level by reinforcing the behaviour with larger wins will cause people to become problem gamblers.) I am unaware of this practice in Victoria, but if it is occurring there then we might have to reconsider this statement.

The recommended replacement for statement 5 is:

5. If a pokie machine has not paid out the big prize in a long time it is more likely to do so soon.

This statement is another form of the gambler's fallacy already covered in statement 2. This new statement however deals with a different manifestation of the belief that the outcomes of gambling are not independent. In Great Britain this statement would be true as the payout rate for the big prizes of fruit machines in smaller establishments changes based on the frequency of payout. This is done so that the store owners don't get caught having to pay out large amounts of cash over a short time span. Gamblers know this and pick machines where the sound of the coin dropping into the bonus bin

tells them how likely the machine is to pay out the big prize (the less distance the coin falls the more likely the bonus will pay out soon).

The new beliefs sub screen would therefore be:

What you believe to be true when you gamble.
- I feel that over time I can come out ahead playing the pokies.
- After a string of losses I sometimes believe that my chances of beating the pokies over the next while will improve.
- I feel I can improve my chances of winning at the pokies by using certain strategies or betting systems.
- A near miss means the machine may pay out big soon.
- If a pokie machine has not paid out the big prize in a long time it is more likely to do so soon.
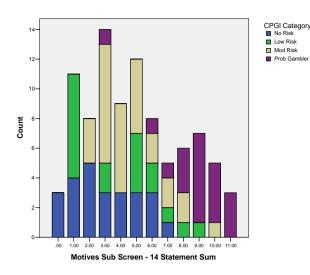
The Motivation Sub Screen

The motivation sub screen tested in Phase II is actually fourteen statements taken from twenty four statements in the full motivation sub screen. It was felt appropriate for purposes of fitting the screens onto a flyer that each sub screen be shortened. Thus there were two or three statements that captured motivations related to a source of big cash, a way to escape the world's problems, a desire to gamble and win, to lose track of time and become engrossed in the games, and finally, to want to gamble on the machines all the time, particularly when exposed to them in a venue. The statements tested are listed below.

Why you play.
- It is worth a try to win at pokies if I need more cash.
- Even if I don't have a lot of money to spend I might as well play the pokies to get big wins.
- I sometimes play pokies with the hope of paying off my debts/bills.
- I play pokies to forget my trouble or worries
- I play pokies just to pass time
- Playing the pokies is a good way to escape.
- I usually feel I'm going to win when I start playing pokies
- I play pokies because I know how to win.
- The only fun part of playing pokies is winning.
- I am a serious pokie gambler.
- Time speeds by when I gamble on pokies
- I lose myself in the pokie games.
- Most times I am in a place that has the pokies I want to play them
- I would like to play pokies almost everyday

Having fourteen statements meant that there were more chances a gambler would agree to several of the statements, and while motives are a reasonably good predictor of problem and risky gambling behaviour, the cut-off had to be set at three or more statements agreed to in order to signal an indication of an at-risk gambler. After examination of the distribution of responses and correlations presented below it was

Motives Sub Screen - 14 Statement Sum

decided to cut the number of statements to eight and set agreements to two statements as an indication of an at-risk gambler.

The graph on the left indicates the relative distribution of positive responses on the screen. Using the cut-off of 3+ statements designated 69 of the 91 gamblers as at-risk, not many more than the 66 identified by the CPGI as at low or medium risk, or to be problem gamblers. However, because the gamblers are being administered several sub screens; it was felt that each sub screen cut-off should be designating fewer gamblers as at-risk than the single CPGI measure. The graph shows that all of the problem gamblers would be classified as at-risk, but more than half (13) of the CPGI no risk segment would also be categorized as at-risk. The potential for false positives was felt to be too high so further analysis was conducted to identify a shorter and more discriminating motives screen.

Table 3 – Correlation Analysis of the Motive Statements with the CPGI Score

	% Agreeing to the statement	Correlation with CPGI Sum Score N = 91	Correlation with CPGI Sum Score PG Excluded N = 72
Sum of 14 Motive Statements		.66	.25
1. It is worth a try to win at pokies if I need more cash.	28%	.44	.28
2. Even if I don't have a lot of money to spend I might as well play the pokies to get big wins	34%	.42	.25
3. I sometimes play pokies with the hope of paying off my debts/bills.	28%	.62	.20
4. I play pokies to forget my trouble or worries	34%	.32	NS
5. I play pokies just to pass time	59%	NS	NS
6. Playing the pokies is a good way to escape.	41%	.18	NS
7. I usually feel I'm going to win when I start playing pokies	42%	.18	NS
8. I play pokies because I know how to win.	4%	.22	.21
9. The only fun part of playing pokies is winning.	50%	NS	NS
10. I am a serious pokie gambler.	10%	.47	NS
11. Time speeds by when I gamble on pokies	54%	.29	.19 (p = .11)
12. I lose myself in the pokie games.	35%	.54	.21
13. Most times I am in a place that has the pokies I want to play them	54%	.43	NS
14. I would like to play pokies almost everyday	13%	.53	NS

Correlation analysis (Table 3) `was conducted to identify those statements most strongly associated with the CPGI score using the full sample and the sample with problem gamblers excluded. Those statements that were not correlated would be candidates for removal. Overall, the summed motivation sub screen is quite highly correlated with the CPGI Score (.66). Responses to all but two of the statements are

correlated with the CPGI score as well, with playing the pokies to pass the time, and "the only fun part of playing pokies is winning" not related to the CPGI score. The correlation levels drop substantially for the CPGI no to moderate risk sample, with the summed motive screen only correlated .25 and eight of the statements not significantly correlated at $p < .11$ or better.

Based on the results in table 3, the 8th statement was dropped because only 4% of the gamblers agreed with the statement. Statements 4 to 7 and 9 were dropped because the correlations for both samples were very low. This eliminated the concept of playing the pokies as a way to pass the time or escape as a motive tested but if these were not found to be associated with problem gambling so in the interest of shortening the screen they were eliminated.
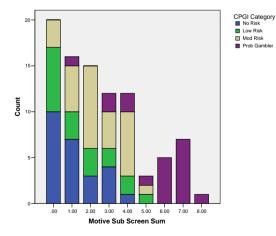
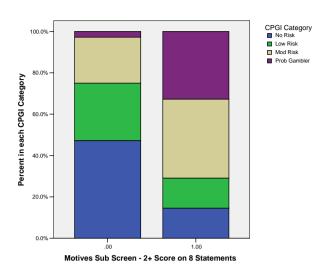The revised motivation sub screen is presented below.

Why you play.
1. It is worth a try to win at pokies if I need more cash.
2. Even if I don't have a lot of money to spend I might as well play the pokies to get big wins.
3. I sometimes play pokies with the hope of paying off my debts/bills.
4. I am a serious pokie gambler.
5. Time speeds by when I gamble on pokies
6. I lose myself in the pokie games.
7. Most times I am in a place that has the pokies I want to play them
8. I would like to play pokies almost everyday

Statements dropped from the motives sub screen are:

1. I play pokies to forget my trouble or worries
2. I play pokies just to pass time
3. Playing the pokies is a good way to escape.
4. I usually feel I'm going to win when I start playing pokies
5. The only fun part of playing pokies is winning.
6. I play pokies because I know how to win.

The revised motives sub screen was tested against the CPGI. The graph on the left shows the new distribution is considerably shifted left. Using 2+ statements as an indication of risk, 55 gamblers are now identified as at-risk, including 18/19 of the CPGI Problem gamblers and including 8/25 of the CPGI no risk gamblers.

The distribution of CPGI categories is substantially different for those for whom risk is indicated by the revised screen. Over 70% of these gamblers were categorized as at moderate risk or problem gamblers by the CPGI. Conversely, over 70% those for whom risk is not indicated by the motive sub screen are in the no risk or low risk CPGI categories. The correlation with the CPGI score is .74, .39 for the sample of no to moderate risk gamblers.

Gambling Behaviours Sub Screen

The Gambling Behaviour sub screen is comprised of seven representative statements drawn from twenty-six behaviour statements found to be associated with problem gambling. These are presented below:

How you play
- I sometimes spend more time playing the pokies than I intend to.
- After losing money playing the pokies, I go back later that day or on another day in order to win my money back.
- The largest amount I have ever lost at one time playing the pokies keeps getting larger.
- I have more trouble quitting when I am ahead than I used to.
- I have started to use my bank or cash (EFTPOS) card to get more money to continue playing the same day.
- I now spend most of the time while at the location playing the machines.
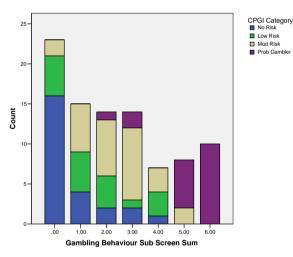- I increasingly spend more than intended.

Table 4 presents the percent of gamblers agreeing to the statements, as well as the correlations with the CPGI score, first with the total sample, second with the problem gamblers removed. The correlation with the CPGI is very high at .77 which shows strong convergent validity.

A large percent (68%) agreed to the statement that they sometimes spend more time playing the pokies than they intended to. Having such a high scoring statement dramatically increases the chances gamblers will be indicated as having risky behaviour by this screen. However, the correlation of agreement with this statement with the CPGI score for the total sample is reasonably high (.47), but more importantly it is the highest (.43) for the sample with problem gamblers excluded. It was therefore decided not to amend the statement in order to reduce the percent of people agreeing to it.

Table 4 – Correlation Analysis of the Gambling Behaviour Statements with the CPGI Score

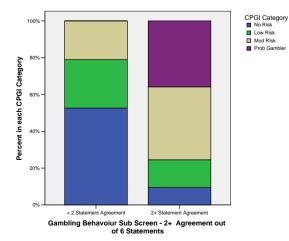|	% Agreeing to the statement	Correlation with CPGI Sum Score N = 91	Correlation with CPGI Sum Score PG Excluded N = 72
Sum of 7 Gambling Behaviour Statements		.77	.51
1. I sometimes spend more time playing the pokies than I intend to.	**68%**	**.47**	**.43**
2. After losing money playing the pokies, I go back later that day or on another day in order to win my money back.	**27%**	**.66**	**.34**
3. The largest amount I have ever lost at one time playing the pokies keeps getting larger.	**14%**	**.29**	**NS**
4. I have more trouble quitting when I am ahead than I used to.	**41%**	**.47**	**.30**
5. I have started to use my bank or cash (EFTPOS) card to get more money to continue playing the same day.	**31%**	**.64**	**.28**
6. I now spend most of the time while at the location playing the machines.	**32%**	**.54**	**.38**
7. I increasingly spend more than intended.	**34%**	**.52**	**NS**

Only 14% agreed to the statement concerning their largest loss increasing so it is likely that the statements predictive power is limited. The correlation is low (.29) for the total sample, and not significant for the problem gambler excluded sample. It is possible that gamblers have some difficulty estimating their largest loss and in particular whether it is increasing or not. For these reasons this statement was dropped from the screen. Dropping this statement did not change either sample's correlation with the CPGI.

The graph to the left shows the CPGI category by the gambling behaviour sub screen sum which ranges from zero to six. In phase one of the study it was recommended that a score of four or greater was required in order to indicate a risk of problem gambling. However, taking into account all the categories of the CPGI it can be seen that a cutoff of two is more suitable with only 5/25 of the CPGI no risk gamblers being indicated as at-risk by this screen. Having the cut-off at 2+ has the added advantage of leaving only the beliefs sub screen with a different cutoff.

The graph on the left illustrates how approximately 80% those indicated to be at-risk are CPGI moderate risk

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or problem gamblers while roughly 80% of those not indicated as at-risk are no or low risk gamblers and there are no problem gamblers.

Physiological and Emotional Response Sub Screen

These cues have the advantage of being reminders during the gambling session and therefore may be timely in helping the gambler control their problematic gambling behaviours. There were six responses tested in the screen as listed below.

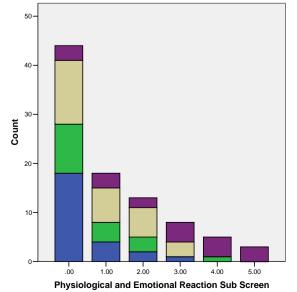**What you frequently experience when playing**.
- Butterflies in your stomach
- Heart racing/pounding
- Nausea/feeling sick to your stomach
- Headaches
- Angry/frustrated
- Sad/depressed

Table 5 shows that in general the percent of gamblers agreeing that they frequently have these responses while playing the pokies is relatively low, with only the last two over 30%. When the problem gamblers are excluded there are four significantly correlated statements.

Table 5 – Correlation Analysis of the Physiological and Emotional Response Statements with the CPGI Score

	% Agreeing to the statement	Correlation with CPGI Sum Score N = 91	Correlation with CPGI Sum Score PG Excluded N = 72
Sum of 6 Physiological and Emotional Response Statements		**.56**	**.32**
1. Butterflies in your stomach	**21%**	**.32**	**.19**
2. Heart racing/pounding	**23%**	**.29**	**NS**
3. Nausea/feeling sick to your stomach	**14%**	**.51**	**NS**
4. Headaches	**18%**	**.30**	**.31**
5. Angry/frustrated	**43%**	**.17(p=.06)**	**.25**
6. Sad/depressed	**37%**	**.46**	**.26**

It was decided that statement 5, angry/frustrated would be dropped from the screen as a relatively large number of CPGI designated 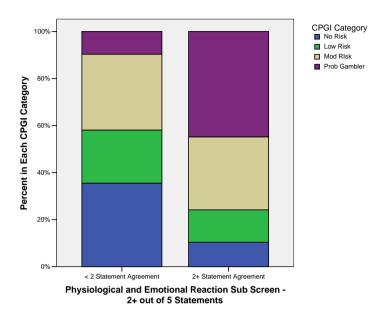no risk gamblers had agreed with this statement, greatly reducing the screen's ability to discriminate no risk gamblers from those in the other categories.

The graph on the left presents the distribution of CPGI categories by the number of agreed to statements in the revised screen. It is apparent that gamblers

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are less likely to agree to these statements than to those in other screens. In particular only a small percent of those who according to the CPGI are no risk gamblers say they frequently exhibit these reactions while gambling on the machines.

**Physiological and Emotional Reaction Sub Screen -
2+ out of 5 Statements**

Of those testing positive on this screen, approximately 80% are problem or moderate risk gamblers according to the CPGI. While the confidence level for this screen is high it does not as effectively identify all of those who are moderate or problem gamblers with over 40% of those not testing positive being in these CPGI categories.

This sub screen is quite distinct from other screens in that they do not measure physiological and emotions reactions during play that are associated with problem gambling. These reactions appear to occur in a relatively low number of gamblers, but when they do occur they are relatively powerful in identifying the gambler as a moderate risk or problem gambler.

The Torment Sub Screen

There were five statements in the Torment Sub-Screen.

How playing makes you feel.
- I spend time thinking about the pokies when I'm not playing.
- I sometimes feel anxious, restless or irritable because I can't play the pokies when I want to
- I sometimes have trouble sleeping thinking about playing the pokies.
- Sometimes I am depressed that I play the pokies.
- I sometimes feel guilty about the amount of money I spend on the pokies.

The overall correlation with the CPGI sum score is respectable at .66, .37 with the problem gamblers removed (Table 6). All of the individual statements have significant correlations with the CPGI sum score for the total sample while three of the statements are correlated when the problem gamblers are removed. These results suggest that higher risk gamblers can feel guilty or depressed about their gambling but only the problem gamblers are more likely to feel anxious or restless or to spend time thinking about pokies when they are not playing. This sub screen could therefore be effective in distinguishing between these two types of gamblers.

Table 6 – Correlation Analysis of the Torment Sub Screen Statements with the CPGI Score

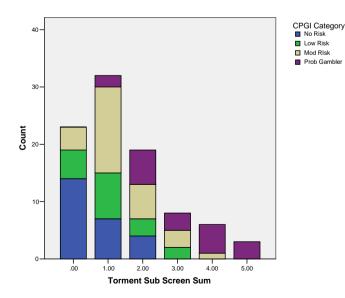|	% Agreeing to the statement	Correlation with CPGI Sum Score N = 91	Correlation with CPGI Sum Score PG Excluded N = 72
Sum of 5 Torment Statements		.66	.37
1. I spend time thinking about the pokies when I'm not playing.	**22%**	**.30**	**NS**
2. I sometimes feel anxious, restless or irritable because I can't play the pokies when I want to	**15%**	**.56**	**NS**
3. I sometimes have trouble sleeping thinking about playing the pokies.	**7%**	**.44**	**.20**
4. Sometimes I am depressed that I play the pokies.	**33%**	**.55**	**.36**
5. I sometimes feel guilty about the amount of money I spend on the pokies.	**69%**	**.38**	**.33**

The fifth statement has 69% agreement which is probably too high. Most of those who would be testing positive on this screen would be agreeing to this statement and then to one or more others. I am recommending that we reduce the potential for agreement with this statement in order to make it more discriminating by changing the word "sometimes" to "often". The revised statement then becomes:
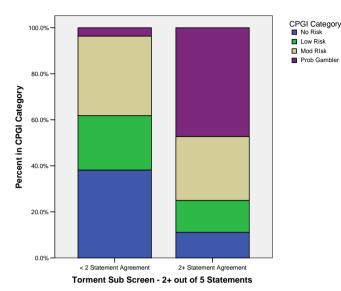
I often feel guilty about the amount of money I spend on the pokies.

A few gamblers did test positive on this screen even though they fell into the SAPGS at-risk category and this statement was the major contributor to their testing positive. If it is made more difficult to agree to this statement I believe the screen's discrimination power will be improved.

The third statement was only agreed to by 7% (6/91) of the respondents which means that it has limited ability to help identify problem or moderate risk gamblers. However, it is still significantly correlated for both samples and I cannot come up with a more suitable statement to replace it. I believe each sub screen should have a minimum of five statements, and there is obviously some benefit and no harm in keeping the statement in the screen.

The graphs to the left shows distribution of CPGI categories by the torment sub screen sum score. The 2+ cut-off works well for discriminating between problem gamblers and those in the other CPGI categories. As well, only four of the twenty-five no risk gamblers test positive with a 2+ cut-off.

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Torment Sub Screen - 2+ out of 5 Statements

Almost 80% of those who test positive on this screen are either problem gamblers or moderate risk gamblers according to the CPGI. Only about 10% of the no risk category test positive giving the screen a reasonably high confidence rate when indicating a risk in gambling.

The Impact Sub Screen

The impact sub screen is composed of five statements listed below:
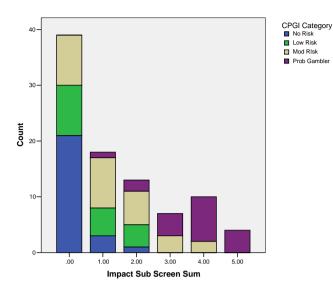
How playing the machines impacts your life.
- I sometimes borrow money in order to continue gambling.
- I continue to gamble despite the negative consequences.
- I have neglected family, friends or work in order to gamble.
- I juggle funds to pay debts due to gambling.
- I have friends or family who worry or complain about me playing the pokies

Many of the CPGI statements deal with the consequences of problem gambling behaviour and therefore, as expected, the correlation between the impact sub screen and the CPGI score is very high at .79, .57 for the sample with problem gamblers excluded.
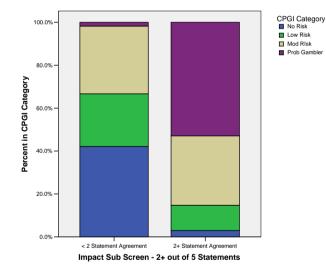
Table 7 – Correlation Analysis of the Impact Sub Screen Statements with the CPGI Score

	% Agreeing to the statement	Correlation with CPGI Sum Score N = 91	Correlation with CPGI Sum Score PG Excluded N = 72
Sum of 5 Impact Statements		**.79**	**.57**
1. I sometimes borrow money in order to continue gambling.	**18%**	**.60**	**.40**
2. I continue to gamble despite the negative consequences.	**48%**	**.62**	**.46**
3. I have neglected family, friends or work in order to gamble.	**14%**	**.40**	**.29**
4. I juggle funds to pay debts due to gambling.	**23%**	**.62**	**NS**
5. I have friends or family who worry or complain about me playing the pokies	**34%**	**.64**	**.37**

This screen correlates highest with the CPGI score for both samples and is obviously good at predicting both problem and moderate risk gamblers. Statement three has a low percent agreeing but this is within the acceptable range. There is no reason based on these results to drop or change any of these statements.

Relatively few of the respondents tested positive on this screen. The cut-off of 1+ could be used to indicate a positive test, but for consistency sake I recommend we leave it at 2+.

Well over 80% of those who test positive are moderate risk or problem gamblers according to the CPGI. The confidence level that the gamblers are at least low risk gamblers if they test positive on this screen is very high, more than 90%.
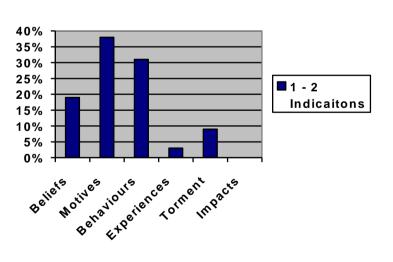
SAPGS Whole Screen Analysis

The SAPGS with the revised sub screens (recommended statements removed) was used to test the validity of the SAPGS and its ability to identify at-risk gamblers. There are three analyses described, the first examines the distribution of the sub screens for which those in the three proposed SAPGS categories tested positive. This will examine the appropriateness of the proposed cut-offs for the SPAGS screen.

The second analysis examines the convergent validity of the SAPGS and its sub screens with the CPGI. The final analysis produced the distribution of categories for the SAPGS and CPGI corrected for the frequency bias inherent in the sampling technique used to recruit gamblers so that the proportion of gamblers in each of these categories who might be administering the screen to themselves could be estimated.

SAPGS Category Analysis

One of the mandates in developing this screen was that it be useful for targeting people who are in the process of developing problematic behaviours. To this end, six sub screens were developed based on a hierarchy of effects model that presumes that some people develop beliefs or have motives that will lead to problematic behaviours. This will result in negative experiences at the machines, torment and harmful impacts on their lives. If this model is working then we would expect to see those who trip on just one or two of the sub screens, that is, one or two indications they are at risk, would do so on the first three sub screens, beliefs, motives and gambling behaviours.

Since the focus was to be on those developing problematic levels of gambling, the Phase II sample was restricted to those who had started gambling on the pokies within the last two years. This increases the chances that a hierarchy of effects will be found if it exists.

The graph to the left shows the distribution of indications of risk for the 27 respondents who tested positive on one or two sub screens. It can be seen that almost all the positive tests (88%) occur in the first three sub screens which confirms the existence of a hierarchy of effects. More detailed figures are presented in table 8. These results have critical implications for the confirming the validity of the screen, the value of the way this screen had been designed, and provides a criterion for setting the cut-offs defining the at-risk category.

Table 8 – Distribution of Positive Screens by Sum of Positive Screens

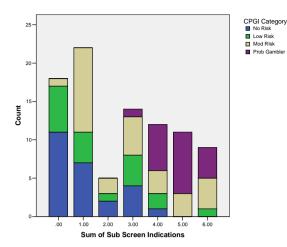| Sum Positive Screens	SAPGS Sub Screens						Total
	Beliefs	Motives	Behaviour	Experiences	Torment	Impacts	
1	14%	41%	36%	0%	9%	0%	100%
2	30%	30%	20%	10%	10%	0%	100%
3	10%	29%	26%	7%	14%	14%	100%
4	4%	23%	25%	15%	15%	19%	100%
5	5%	20%	20%	16%	20%	18%	100%
6	17%	17%	17%	17%	17%	17%	100%
Cumulative							
1 – 2	19%	38%	31%	3%	9%	0%	100%
1 – 3	14%	32%	28%	5%	12%	8%	100%

From the results in table 8 it is clear that those who have a score 1 or 2 on the SAPGS are lower on the hierarchy and are at the early stages of problematic gambling behaviour. Of all the positive tests on the three impact sub screens, only 4% were accounted for by those who scored 1 or 2 on the SAPGS, the remaining 96% were those who scored 3+. Based on these results it was felt appropriate to maintain the three categories of gambling effects for the SAPGS with a score of 0 indicating no risk, scores of 1 and 2 indicating gamblers "at-risk" as their beliefs, motives and gambling behaviours are likely to lead to harmful effects, and then those with a score of three or more designated as problem gamblers and warned to change their ways and seek help.

Convergent Validity with the CPGI

Table 9 summarizes the overall correlations of the sub screens with the CPGI score. For the total sample the overall correlation between the SAPGS score and the CPGI score is .67. Similarly good correlations are obtained for four of the screens, ranging from .66 to .79. The beliefs sub screen has a very low correlation but was retained because of its traditional connection to problem gambling and the possibility that it may help potential problem gamblers to avoid harmful impacts. The low correlation of .56 with the physiological and emotional response screen is due to the fact that the CPGI does not deal with any of these problem gambling impacts.
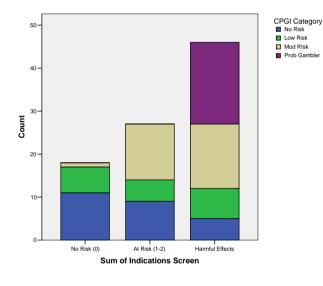
Table 9 – Correlation Analysis of the SAPGS Screens with the CPGI Score

	% Testing Positive on the Screen	Correlation with CPGI Sum Score N = 91	Correlation with CPGI Sum Score PG Excluded N = 72
SAPGS Score		**.67**	**.47**
Beliefs	**24%**	**.21**	**NS**
Motives	**55%**	**.74**	**.39**
Gambling Behaviour	**53%**	**.77**	**.51**
Physiological and Emotional Response	**29%**	**.56**	**.32**
Torment	**36%**	**.66**	**.37**
Impacts	**34%**	**.79**	**.57**

The graph on the left shows the CPGI category distribution broken out by the SAPGS score. Those who score 3+ on the SAPGS are composed of problem gamblers and those at moderate risk according to the CPGI. Those who scored 1 on the SAPGS are comprised primarily of those who are in the no or low risk CPGI categories. The CPGI moderate risk gamblers comprise gamblers across the spectrum of scores SAPGS. However, I believe the SAPGS is superior to the CPGI in breaking out at-risk and problem gamblers and these CPGI moderate risk gamblers are comprised of both of these types of gamblers.

As can be seen in the graph to the left, half of the sample is designated as problem gamblers by the SAPGS. The problem gambler label is used because almost all of these people tested positive on one of the three impacts sub screens and testing positive on three or more of the sub screens should be a strong indication that something is wrong. The moderate risk gamblers are split between the SAPGS at-risk and problem gambling categories, though as I concluded above, I believe these gamblers to be better categorized by the SAPGS than the CPGI.

The fact that half of the sample is designated as problem gamblers is a function of the sampling technique used in the sample. This distribution would be expected to be found at any given time at the venue, but over an extended period of time the distribution of those taking the screen would be expected to shift toward the no risk gambling segment as discussed below.
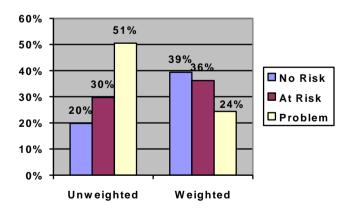
Analysis Adjusted for Frequency Bias

The sample for this research is representative of those who would be found at a gambling venue in a given week. Those who visit the venue regularly would be far more likely to be recruited into the study than someone who only visits the venue once every month. However, the materials would be available to all gamblers who might visit a venue, so in order to examine the profile of those who would likely be exposed to the screen we need to adjust the sample so that it is more representative of the whole population of gamblers. That is, we need to include more people who infrequently visit the venue as they are under-represented in our existing sample.

This can be accomplished in a rough manner by weighting the responses inversely to the frequency with which they are at the gambling site. I used the frequency of gambling as a surrogate measure under the assumption that the gamblers are most likely to examine the material if they are in fact gambling and thus in the part of the establishment that has the pokies. Also, there were only four levels used to categorize the frequency of gambling which introduces more error in the estimate. However, I feel that it is useful to examine the distributions produced with the weighted data in order to better gage the characteristics of those taking the screen.

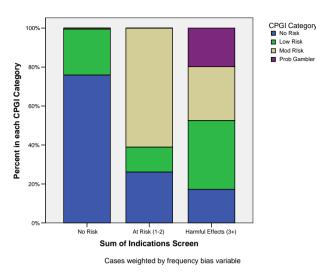The weights are shown below and represent the inverse of the frequency with which the gambler gambled.

How often do you play the pokies?

	Weight
Once a week or more	1
Once a fortnight or more	3
Once a month	6
At least once every 2 to 6 months	26

Analysis with the weighted data produces a substantially different distribution. When frequency bias of the sample is taken into account, the percentage of those who would be classified as no risk doubles to approximately 39%, those at risk rises slightly to approximately 36%, and those who are experiencing harmful effects declines from half to a quarter of those filling out the screen.

What needs to be learned from this chart is that the largest segment of those who take the screen are likely to be categorized as no risk gamblers, the smallest segment is likely to be those who are experiencing harmful effects from their gambling. As well, those at risk make up a substantial proportion, roughly a third of those taking the screen and it these people who may benefit the most it.

Sum of Indications Screen

Cases weighted by frequency bias variable

The graph on the left indicates that virtually all of those who are designated as no risk by the SAPGS would be categorized as no or low risk by the CPGI. As well, all of those categorized by the CPGI as problem gamblers would be designated as problem gamblers by the SAPGS. Conversely, roughly half of those designated as problem gamblers by the SAPGS would be classified as problem or moderate risk gamblers by the CPGI. Only 17% of the SAPGS problem gamblers would have been categorized as no risk by the CPGI.

Final Configuration of the Victoria Self Administered Problem Gambling Screen

The screen is designed specifically to measure at-risk and problem gambling associated with gambling on egms (pokies).

The screen has six sub screens dealing with beliefs, motives, gambling behaviour, physiological and emotional responses while gambling, feelings of torment, and harmful impacts due to gambling on the pokies.

If a person answers in the affirmative to three of the beliefs statements, or on two or more of the statements in the other five sub screens, they have tested positive on that sub screen. The person then sums the number of sub screens on which they have tested positive to arrive at an overall SAPGS score. If they have a 0 they are designated no risk. A score of 1 or 2 means they are at risk and they are warned that they may be headed for problems because of their gambling and that they should change their behaviours.

If they score 3 or more they have likely reached the problem gambling stage, though they are not told this. Instead they are told that they should be concerned about their gambling and that they should seek assistance from their friends, family or call the help line.

The six revised screens are listed below.

What you believe to be true when you gamble.
- I feel that over time I can come out ahead playing the pokies.
- After a string of losses I sometimes believe that my chances of beating the pokies over the next while will improve.
- I feel I can improve my chances of winning at the pokies by using certain strategies or betting systems...
- A near miss means the machine may pay out big soon.
- If a pokie machine has not paid out the big prize in a long time it is more likely to do so soon.

Why you play.
- It is worth a try to win at pokies if I need more cash.
- Even if I don't have a lot of money to spend I might as well play the pokies to get big wins.
- I sometimes play pokies with the hope of paying off my debts/bills.
- I am a serious pokie gambler.
- Time speeds by when I gamble on pokies
- I lose myself in the pokie games.
- Most times I am in a place that has the pokies I want to play them
- I would like to play pokies almost everyday

How you play
- I sometimes spend more time playing the pokies than I intend to.
- After losing money playing the pokies, I go back later that day or on another day in order to win my money back.
- I have more trouble quitting when I am ahead than I used to.
- I have started to use my bank or cash (EFTPOS) card to get more money to continue playing the same day.
- I now spend most of the time while at the location playing the machines.
- I increasingly spend more than intended.

What you frequently experience when playing.
- Butterflies in your stomach
- Heart racing/pounding
- Nausea/feeling sick to your stomach
- Headaches
- Sad/depressed

How playing makes you feel.
- I spend time thinking about the pokies when I'm not playing.
- I sometimes feel anxious, restless or irritable because I can't play the pokies when I want to
- I sometimes have trouble sleeping thinking about playing the pokies.
- Sometimes I am depressed that I play the pokies.
- I often feel guilty about the amount of money I spend on the pokies.

How playing the machines impacts your life.
- I sometimes borrow money in order to continue gambling.
- I continue to gamble despite the negative consequences.
- I have neglected family, friends or work in order to gamble.
- I juggle funds to pay debts due to gambling.
- I have friends or family who worry or complain about me playing the pokies

Summary and Conclusions

This section is included in the executive summary at the beginning of this report.