

GAMBLING AND CO-MORBID DISORDERS

February 2013



Gambling Research Australia (GRA) is a partnership between the Commonwealth, State and Territory Governments to initiate and manage a national gambling research program structured around the following five research priority areas:

- helping individuals set their limits including access to cash and pre-commitment
- responsible gambling environments
- gaming machine standards – developing better consumer protection
- a preventative and early intervention strategy targeted at those at risk of problem gambling
- development of harm minimisation measures for interactive gambling.

The Secretariat is provided by the Office of Liquor, Gaming and Racing, Department of Justice, Victoria. Further information about the national research program may be obtained from www.gamblingresearch.org.au

GRA commissioned researchers from Southern Cross University to undertake a study into *Gambling and Co-Morbid Disorders* which falls within the research priority of *preventative and early intervention strategy targeted at those at risk of problem gambling*.

The objectives of the research are to:

- Increase the understanding of the role of co-morbid disorders in problem gambling
- Assist in development of effective prevention and intervention measure to avoid problem gambling.

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Acronyms

GRA	Gambling Research Australia
SCU	Southern Cross University
PGSI	Problem Gambling Severity Index
EGM	Electronic Gaming Machines
DSM-IV	Diagnostic & Statistical Manual
DASS	Depression Anxiety Stress Scale
AUDIT	Alcohol Use Disorders Identification Test
FTND	Fagerstrom Test for Nicotine Dependence
DAST-10	Drug Abuse Screening Test
UPPS	Urgency, Premeditation, Perseverance, Sensation seeking
SEM	Structural Equation Modelling
APD	Antisocial Personality Disorder
BPD	Borderline Personality Disorder

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Executive Summary

The issue of ascertaining the temporal relationship between problem gambling and co-occurring disorders is an important one. By understanding the connection between problem gambling and co-morbidities in the general population, as well as within subgroups and treatment samples, better treatment and harm minimisation strategies, as well as useful and appropriate policies, can be developed.

This research was commissioned by Gambling Research Australia (GRA) in response to this lack of evidence. Specifically, GRA asked the authors to examine the following research questions:

1. What is the temporal relationship between problem gambling and other co-occurring disorders?
2. Does the presence of a particular morbid condition or a series of co-morbidities predict the development or presence of problem gambling? If so, provide advice on the best public health strategies for use in the mental health and addiction sectors.

A sequential mixed methods design, comprising six stages, was devised in response to these questions. Stage 1 was a review of the literature. This confirmed that the rates of alcohol dependence, smoking and other drug use appear to be significantly higher in problem gamblers than in the general population. In addition, there was strong evidence to suggest that problem gamblers have increased rates of mental disorders, including depression, suicide ideation and anxiety disorders. However, it remained unclear as to the direction of causality and nature of the association between gambling and DSM-IV recognised mental disorders.

The findings of the literature review were thus explored with a sample of problem gambling counsellors and mental health experts in a series of forums, focus groups and interviews that comprised Stage 2 of the research. These participants (in total, N=101) were asked to describe and discuss the prevalence and likely temporal sequencing of the range of disorders identified in Stage 1 in relation to the development of gambling problems. Identification of additional disorders was also encouraged. A list of eight disorders was identified by this group as those most likely to co-occur with problem gambling. These were: depression, anxiety disorders, alcohol abuse/dependence, drug abuse/dependence, nicotine dependence and personality

disorders. With regard to personality disorders the issue raised was not in relation to the temporal sequencing with problem gambling, as these disorders tend to occur early in a person's life, but was related to their necessary inclusion in any predictive model of problem gambling. In particular, anti-social personality disorder and borderline personality disorder were considered to be two of the more salient personality disorders co-occurring with problem gambling.

Most counsellors and therapists reported that they see men and women, younger and older people with the co-morbid conditions and would not specify any groups based on these demographic variables. While several therapists said that the drug and/or alcohol disorder usually came before the problem gambling, most of these did acknowledge that the temporal sequencing of disorders can, however, go either way. All agreed that drug and alcohol disorders are associated with problem gambling and that there is a tendency for disorders to present together.

Most therapists and counsellors believed that depressive disorders and/or anxiety disorders come before problem gambling. Others noted in their responses that the sequencing was dependent on the condition being treated. Clearly, the results from these interviews were inconclusive. All agreed that there is an association between disorders and acknowledged the need for further research concerning the temporal sequencing and the nature of the relationship between co-morbid disorders.

For that reason the next three stages of the research were quantitative assessments of the temporal sequencing of problem gambling with mental health co-morbidities. The first of these, Stage 3 aimed to provide this information through an online survey of problem gamblers in treatment. This was to obtain a retrospective account of disorders and establish the temporal sequencing through the age of first onset for disorders. To measure the levels for each disorder, the scales chosen needed to have been based on the DSMIV criteria and to have previously shown some relationship with problem gambling. It was also preferred if these scales had shown this relationship with an Australian sample of gamblers and were brief and able to be administered via online questionnaire and via telephone interview. The scales chosen were the Depression Anxiety Stress Scale (DASS: depression and anxiety only), the Alcohol Use Disorders Identification Test (AUDIT), the Fagerstrom Test for Nicotine Dependence (FTND) and the Drug Abuse Screening Test (DAST-10).

For the anti-social and borderline personality disorders there were no scales suitable for research purposes as these disorders tend to require a diagnosis by a qualified therapist. However, a key behavioural characteristic of both disorders is impulsivity and impulsivity has been implicated as a predictor of problem gambling in previous studies. A relatively new multi-faceted impulsivity scale (the UPPS - P) that has shown particularly good construct validity was also included.

The online survey was promoted through problem gambling counselling agencies throughout Australia and achieved a final sample size of 267. Of the five mood and substance abuse disorders tested in this and subsequent stages of the study (depression, anxiety, alcohol abuse, nicotine dependence, drug abuse) there were only 4 of the 267 (1%) respondents who reported never having one of these other disorders with the majority experiencing depression and anxiety. Age of onset of all disorders and problem gambling were compared using a range of tests that revealed consistent differences between men and women in the sample.

Descriptive information revealed that the women in the sample were about eight years older than the men at the time of the survey (48.72 vs. 40.58 years). However, men reported their first onset of problem gambling as occurring around 11 years earlier than women (26.64 vs. 37.84 years). Both men and women indicated that EGMs were the form of gambling associated with their initial gambling related problems however, for men this figure was much lower than for women and for men the number who cited horse and greyhound racing was much higher than for women.

There were few participants who did not report experiencing depression (8%) or anxiety (19%) at some stage in their life. For men who experienced either mood disorders it appeared that the first onset of problem gambling was more likely to occur before the first onset of depression or anxiety and for women it appeared that problem gambling was more likely to occur after the first onset of depression or anxiety. Furthermore, even when the first onset of problem gambling did occur after the first onset of depression or anxiety for either gender, it was occurring at a significantly much later stage for women than for men.

A large proportion of all problem gamblers did not report experiencing alcohol I (64%) and drug abuse (72%) at any time and around half (46%) indicated that they had never been nicotine dependent. This suggests that for many gamblers problem gambling is

unlikely to be related to substance abuse as a large proportion of problem gamblers never experience problems with alcohol, nicotine or other drugs. Of those who did, most reported experiencing the substance abuse before the first onset of problem gambling and for women, the effect was stronger but the mean number of years between onsets greater than for men.

For the impulsivity facets it was found that negative urgency (a tendency to act impulsively under conditions of negative affect) was a significant, positive predictor of problem gambling for both men and women. That is, higher levels of negative urgency were related to higher levels of problem gambling. It was also found that sensation seeking was a significant, negative predictor of problem gambling for women with higher levels of sensation seeking correlating with lower levels of problem gambling.

Overall, the results from Stage 3 revealed clear patterns in the temporal sequencing of the first onset of problem gambling and the first onset of most other mood and substance abuse disorders. This was utilising a sample of treatment seeking gamblers and it remained unknown whether a similar result would be present in the general population. It also remained unknown if the retrospective accounts of first onset would be supported by prospective or longitudinal data testing any relationship or connection between disorders. Thus, Stage 4 of the study sought to replicate the analysis with a national telephone survey of regular gamblers (Time 1) with a 12 month follow-up (Time 2) to determine if problem gambling was a stronger predictor of mood and substance abuse than mood and substance abuse was of problem gambling.

Of the 620 regular gamblers who participated in Time 1, electronic gaming machines were the most frequently played form of gambling among this community sample and attracted the most expenditure (median = \$600 per year). This was followed by betting on horse and greyhound racing. For the other forms of gambling, the majority of participants indicated no involvement in the past 12 months, however, there were some participants who were heavily involved in these forms. About 30 per cent (n=188) of the sample indicated that they had experienced problem gambling at some time in their life, with women most likely to indicate a problem with EGMs (90%) and men EGMs (42%) and racing (46%).

The problem gamblers were assessed in a similar manner to Stage 3 and asked questions about the age of first onset for problem gambling and the other disorders.

The results tended to mirror that of Stage 3 (treatment seeking problem gambler) although there was less prevalence reported for the other disorders. More than half of 188 participants who had experienced problem gambling reported that they had never experienced depression or anxiety in their lifetime. Of those who had, men were 4.59 times more likely than women to experience problem gambling before depression and 5.86 times more likely than women to experience problem gambling before anxiety. These findings were statistically significant and were further supported by an analysis of the mean number of years between disorders.

The results for the substance abuse disorders followed a similar pattern, but significance testing was hindered by the low prevalence of these disorders amongst the problem gamblers. Again, this is an important result as the low prevalence rate suggests there is no relationship between substance abuse and problem gambling. Nonetheless, it appears that the defining feature of the age of first onset data is the very late onset of problem gambling for women.

The next stage of the research represented Time 2 of the longitudinal component and as such required administering many of the same scales to the same participants from Time 1, approximately 12 months after initial contact. This analysis was designed to augment the retrospective accounts provided by both the 267 treatment seeking gamblers and the 188 self-identified problem gamblers from the community. There were 455 of the original 620 (73%) from Time 1 who completed the follow-up stage.

The 455 participants were a sub-sample of Time 1 and both the full sample (N=620) and the sub-sample (n=455) were generally consistent on each key demographic variable, although the Time 2 sample was slightly older and contained a slightly greater proportion of women. The sample for Time 2 also gambled around 13 times per year less frequently, in total, than the Time 1 sample. In terms of problem gambling, the Time 2 sample comprised a much larger number of non-problem gamblers (43% at Time 1 and 55% at Time 2) and fewer 'at-risk' gamblers (21%, 16%). The number of problem gamblers at Time 1 was 9% and at Time 2 was 6%. This may be explained by the recruitment of participants in Time 2 being limited to around 400 due to budget and time constraint. The effect of this was that the sampling procedure was one of convenience for Time 2, with no call backs, and this biased the sampling toward those participants who were easy to reach by telephone. That is, participants who were more

likely to be at home and not out gambling had a greater chance of participating in Time 2.

The subsequent analyses utilised both Time 1 and Time 2 data and considered the first research question: *What is the temporal relationship between problem gambling and other co-occurring disorders?* Unlike the age of first onset data that examined categories of before and after the first onset of problem gambling, the longitudinal analysis examined the relative changes in the severity of disorders across time. Structural Equation Modelling (SEM) was used to explore the relationship between each mental health disorder and problem gambling across the 12 month period, to obtain standardised regression coefficients. These coefficients could then be compared to assess the relative strengths of the relationships across time (e.g., does depression predict later problem gambling more strongly than problem gambling predicts later depression). The benefit of this is that all participants would have a severity score for all disorders (even if it was zero) and any changes in the severity of any disorders could be analysed in comparison to any changes in their problem gambling score over the 12 months. This was undertaken separately for both genders.

For the co-morbid disorders of nicotine dependence and drug abuse there was no significant temporal relationship found with problem gambling regardless of gender. Also for women no significant temporal relationship was found between problem gambling and depression or alcohol abuse whilst for men there was no temporal relationship found with problem gambling and anxiety. These null findings must all be considered within the context of the 12 month time period.

However, for men the results suggested that the temporal sequence of problem gambling and depression is that problem gambling is more strongly related to later depression, but depression was not related to later problem gambling. Also for men, problem gambling was related to future alcohol abuse scores, but it was a negative relationship with problem gambling predicting lower alcohol abuse. For women, the temporal sequence appears to be problem gambling leading to higher anxiety scores as anxiety levels were not related to future gambling problems.

Two further analyses then attempted to answer the second research question 'Does the presence of a particular morbid condition or series of co-morbidities predict the development or presence of problem gambling?' Unlike the previous SEM analyses all

disorders were entered simultaneously into a model and this model could not be tested for each gender, due to its complexity and need for a large sample size. The results indicated that most co-morbid conditions do not predict problem gambling. These include depression, nicotine dependence, drug abuse and the impulsivity facets of sensation seeking, positive urgency and lack of premeditation. However, it was found that a tendency to act impulsively under conditions of negative affect (negative urgency), and anxiety were positive predictors of problem gambling 12 months later. Either of these conditions alone predicted higher levels of problem gambling and it was not necessary for a gambler to experience both to have higher levels of problem gambling 12 months later. It was also found that alcohol misuse predicted lower levels of problem gambling in 12 months time.

Stage 6 of this research was designed to address the part of the second research objective, regarding the identification of the best public health strategies in light of significance of negative urgency, anxiety and alcohol abuse as predictors of problem gambling. Eighteen mental health and gambling help experts, including mental health service and gambling help service directors, co-ordinators and managers, participated in telephone interviews.

Participants generally agreed that the relationship between negative urgency, anxiety and problem gambling was supported by their field experiences. However, participants' responses about the third key result: regular gamblers with greater alcohol use had lower problem gambling scores 12 months later, were mixed. While the majority expressed surprise and noted that this result did not match their experiences of assisting their clients, others provided some possible explanations. For instance, several participants explained the result as being whether the primary concern was the gambling behaviour or the alcohol abuse. Others explained this result by noting that clients' problems are often cyclical; sometimes they are having problems with gambling and at other times they are having problems with alcohol abuse.

Expert participants were those involved in assisting people with co-occurring mental health concerns. These participants noted that gambling problems are asked about with presenting clients; however, generally this is through broad discussion. Participants said that it is important that gambling is asked about by other health and welfare workers because 'gambling problems tend to go under the radar'. It was

highlighted that it is especially important that General Practitioners ask about gambling problems when patients present with symptoms of depression and anxiety.

Participants were in agreement that it is beneficial for services to work together, and many noted that this is already happening to various degrees. Some noted that the services in which they work have various services 'under one roof', such as financial counselling and relationship counselling.

Collaborative community education and health promotion activities were also considered important in order to alleviate concerns about approaching counselling services, as well as to educate the public about the indicators of problematic gambling behaviour: television was considered the most powerful medium for achieving this.

Training and professional development was thought to be of high quality while others identified gaps in current training practices. Some stressed the importance of taking 'a holistic approach to training', including areas that commonly go hand-in-hand with gambling problems such as co-occurring mental health concerns and relationship issues. Future policy priorities identified included more funding for permanent counselling positions, especially financial counselling; the removal of gambling advertising from television including sports betting and internet gambling, and raising the profile of problem gambling so it is seen as a public health priority, similar to alcohol and other drug abuse.

In conclusion, this project provided both retrospective and prospective data about the relationship between problem gambling and co-morbid disorders including mood disorders, substance misuse and impulsive personality traits. The participants included problem gamblers in treatment and regular gamblers in the community. It found that the nature of the relationship between problem gambling and other disorders is gender specific. From the retrospective data, it was found that, for women, the first onset of problem gambling is much later in life than for men and this tends to result in the first onset of other disorders to occur before problem gambling. For the men, the results were less distinct, with the first onset of problem gambling and the other disorders occurring much closer together (i.e. between 20 and 30 years of age). These effects were consistent across both the treatment and general community sample.

The prospective data also revealed some gender specific information. For women, problem gambling was more strongly related to anxiety 12 months later, than anxiety

was to problem gambling 12 months later. No other temporal relationships were found between problem gambling and mood and substance abuse disorders. For men problem gambling was more strongly related to later depression than depression was to future problem gambling. Problem gambling was also related to future alcohol misuse, but the relationship was negative indicating that problem gambling predicted lower alcohol use disorders in the future.

Building a model of the predictors of problem gambling included the personality variable impulsivity. For the treatment sample, the model comprised of only the impulsivity facets, with no other disorders. Results indicated that negative urgency was the strongest predictor for both genders and sensation seeking was negative related to problem gambling for women. However, for the community sample of regular gambler a more complete model was tested that included the five co-morbid disorders. Due to the size of this model, gender effects could not be tested but it was revealed that the best predictors of problem gambling were the lone impulsivity facet of negative urgency, along with anxiety and alcohol abuse.

Based on these results, it was reasoned, by a panel of experts with diverse specialities, that public health approaches that maximise public awareness of problem gambling and the co-morbidities investigated, along with adequate resourcing of a range of treatment providers and counsellors would prove most beneficial. These resources included further training of counsellors and access to specialists in these disorders.

Chapter 1 Introduction to the Study

1.1 Project aims and objectives

This research was commissioned by Gambling Research Australia (GRA) in response to a lack of evidence as to the role of psychiatric co-morbidities in problem gambling behaviour. Specifically, GRA asked the authors to examine the following research questions:

1. What is the temporal relationship between problem gambling and other co-occurring disorders?
2. Does the presence of a particular morbid condition or a series of co-morbidities predict the development or presence of problem gambling? If so, provide advice on the best public health strategies for use in the mental health and addiction sectors.

The research design and methods used to address each research question are explored in the balance of this Chapter.

1.2 Methodology

A sequential mixed methods design was applied to this research project. This approach is distinguished by an ability to maximise the advantages of both qualitative and quantitative methods while diminishing the disadvantages (Creswell, 2009; Johnson and Onwuegbuzie 2004). Common to both methods is the use of empirical observations to describe, explain and theorise, and attempts to maximise validity and minimise bias (Johnson & Onwuegbuzie, 2004).

Qualitative data were collected via key informants at the exploratory (Stage 2) and confirmatory (Stage 6) stages of the research. Stage 2, in concert with the literature review, informed the design of the questionnaire administered to both the clinical (Stage 3) and longitudinal community (Stages 4 & 5) samples. The findings of these quantitative stages were finally reviewed in the context of the second research question in Stage 6.

summarises key features of each of these six project stages.

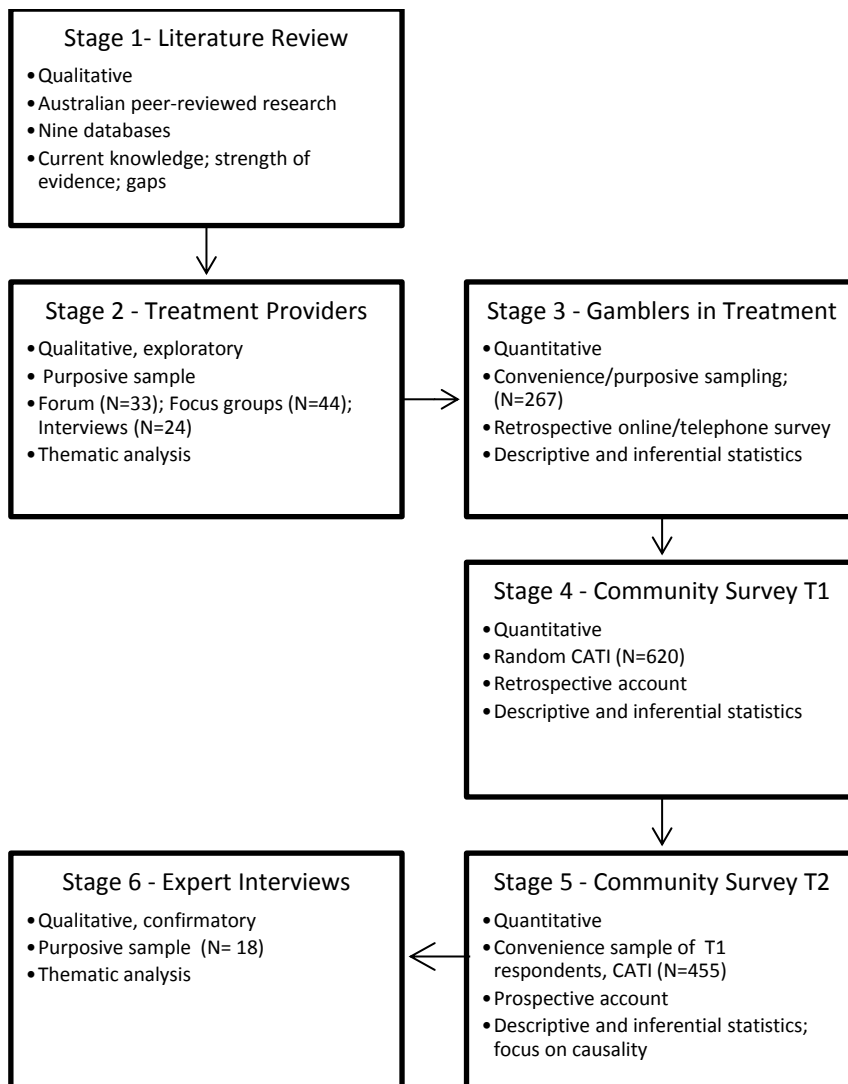


Figure 1-1 - Sequential mixed methods research design

Each of these stages is described in detail below.

1.2.1 Stage 1: Literature review

The purpose of the literature review was to identify the most common disorders associated with problem gambling and gain an understanding of any established temporal relationships. This required a comprehensive review of the problem gambling and co-morbid literature. Before undertaking the literature review some parameters were set around the definition of the term ‘co-morbid disorder’. First, the term is used in this report to refer to any number of disorders associated with problem gambling, even though ‘multi-morbidity’ is the term increasingly used to define co-morbidity with three or more other disorders (van der Akker, Buntinx & Knottnerus, 1996). Second, the current study assessed co-morbid mental health disorders in problem gambling and did

not assess other problems associated with problem gambling such as relationship issues, unemployment, criminal behaviour or co-occurring medical/physical disorders. As such, there was a focus on those disorders represented in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR).

While the literature reviewed had a preference toward Australian studies and studies published from 2000 onwards it also sourced significant and relevant research from other international jurisdictions as appropriate, including Canada, Switzerland the US and New Zealand. This Australian focus was because of the sequential methodology employed where the results were to be discussed in the Stage 2 focus groups with current Australian problem gambling counsellors and needed to be relevant to this group. Primarily, the literature was sourced from computer bibliographic databases, but also conference proceedings, government based websites (e.g., Office of Liquor, Gaming and Racing; Gambling Research Australia) and mental health organisations (e.g., beyond blue, Turning Point Alcohol and Drug centre).

This literature yielded 11 disorders that have been consistently associated with problem gambling. These included depression, bipolar disorder, generalised anxiety disorder, post-traumatic stress disorder, social phobia, agoraphobia, panic disorder, alcohol dependence, nicotine dependence and drug dependence. The literature also revealed that, compared to prevalence studies, there were much fewer studies attempting to establish temporal relationship and these were dominated by retrospective accounts.

1.2.2 Stage 2: Forum, focus groups and interviews

Stage 2 comprised three related procedures designed to augment the findings from the literature review. The list of 11 most prevalent disorders associated with problem gambling formed the basis of a 90 minute forum convened at a national gambling conference in November, 2009. The 33 attendees were predominantly problem gambling counsellors from all states and territories in Australia, with a small number of participants with gambling interests outside of counselling (e.g., policy, research). The forum was digitally recorded and participants were asked to comment on the list of 11 disorders identified from Stage 1 as they related to their experiences with problem gamblers in treatment. The primary interest was in the relative prevalence of these disorders in treatment seeking gamblers. Participants were also asked to identify any disorder that was not on the list that they felt was an important co-morbid condition with problem gambling. Once this was established, participants were then invited to

comment about the temporal sequencing of these disorders with problem gambling (before, same time, after) and also any moderating factors they may be aware of (e.g., gender, culture).

The results from this part of Stage 2 were then presented to three focus groups of problem gambling counsellors attending the NSW problem gambling counsellor's conference in April, 2010. These were much smaller than the original forum (ranging from 6 - 20 participants) and were undertaken to test the forum findings with a smaller group of counsellors.

The third part of Stage 2 involved telephone interviews with 24 individual practitioners who were expert with the co-morbid disorders identified in parts one and two. That is, mental health experts who have experience with gambling, but predominantly help clients with the co-morbid disorder (e.g., depression, alcohol abuse). Purposive sampling was undertaken to generate a national sample of appropriate therapists (Neuman, 2000). These were sourced via professional bodies (e.g. the Australian Psychological Society), relevant government funded organisations (e.g. Alcohol and Drug Information Services) and experts known to the researchers. The 24 interviews were digitally recorded and lasted approximately 25 minutes.

From Stages 1 and 2 the list of co-morbid disorders to be studied was reduced from the original 11 and included the broad categories of depression and anxiety, along with alcohol abuse, nicotine dependence, drug abuse, anti-social personality disorder and borderline personality disorder.

1.2.3 Stage 3: Survey of problem gamblers in treatment

To assess the temporal relationship between problem gambling and other co-occurring disorders a questionnaire was constructed for use online with a final sample of 267 gamblers in treatment. Ethics approval was gained from Southern Cross University's Human Research Ethics Committee, Approval No. 09110.

Participants were recruited via problem gambling help agencies throughout Australia. These included organisations funded through the Responsible Gambling Fund in New South Wales (e.g., Mission Australia, Wesley Mission), the Gambler's Help network in Victoria, the Queensland Government's Gambling Help services, Centrecare Western Australia, Lifeline Canberra and Amity Community Services Northern Territory. These organisations were sent flyers that promoted the study and provided a web link and a telephone number for gamblers in treatment interested in completing the study. The

study was also promoted on the website of Turning Point's 'Gambling Help' web page and to those using the telephone support service.

Interested participants could access the online questionnaire at their leisure or complete it via telephone interview with a Southern Cross University (SCU) researcher. The questionnaire (Appendix A) included an information sheet and a battery of standardised screening tests (detailed below). Participants were reimbursed with a \$20 Caltex Starcard (redeemable for fuel or grocery purchases) for their time and the collection of this data occurred from 26th July, 2010 until 9th September, 2011.

When deciding upon the screening test for each disorder preference was given to those that had been used in prior problem gambling research, that had shown some relationship with DSM criteria and could be administered online and by telephone. Ideally, the scale had also shown good reliability with an Australian sample of adults and was brief with items framed or easily adapted to a 12 month time frame. The scales deemed best to meet these criteria were the nine-item Problem Gambling Severity Index (PGSI: Ferris & Wynne; 2001) the seven-item depression and the seven-item anxiety subscales from the Depression Anxiety Stress Scale (DASS21: Lovibond & Lovibond, 1995). An important point to note with the DASS21 is that the depression subscale aligns closely to the DSM category of mood disorders and the anxiety subscale aligns with the symptom criteria for anxiety disorder in the DSM. Whilst the original list of 11 disorders associated with problem gambling included a range of mood (depression, bipolar) and anxiety disorders (post-traumatic stress disorder, social phobia, agoraphobia, panic disorder, generalised anxiety disorders) the seven-item DASS subscales can only be considered as indicative of these disorders. Furthermore, generalised anxiety disorder is conceptually more similar to the stress subscale of the DASS which was not included in the current study for brevity purposes.

For the substance related disorders, the ten-item Alcohol Use Disorders Identification Test (AUDIT: Saunders, Aasland, Babor, de le Fuente & Grant, 1993), the six-item Fagerstrom Test for Nicotine Dependence (FTND: Heatherton, Kozlowski, Frecker & Fagerstrom, 1991) and the ten-item Drug Abuse Screening Test (DAST10: Skinner, 1982) were included. These are all heavily cited in the literature and have a strong research and clinical screening history.

To identify the age of onset for each disorder the questionnaire included a definition of the disorder followed by a question regarding the participant's experience with the disorder during their lifetime. The definition for the disorder was created from the DSM-

IV and information from the manuals for the scales and their items. Informal pilot testing and scrutiny by the research team and reviewers on the project led to the final definitions for each disorder. If, based on the definition, a participant indicated that they had never experienced the disorder they were skipped to the next section of the questionnaire. If they had indicated some experience with the disorder they were then asked to identify the age (in years) at which this experience had first occurred. This was then followed by the screening test with the instructions to complete it whilst thinking about that time in their life when they first experienced the disorder. The purpose of this was to gauge the accuracy of the participants understanding of the disorder and also to obtain a measure of the severity of the experience.

Below is an example taken from the mood disorders section of the questionnaire:

A depressive disorder is characterised by persistent low mood, problems functioning with everyday activities and a reluctance to participate in activities that were once enjoyable. Other symptoms of depression may include feeling down or sad for an extended period of time and feelings of worthlessness and hopelessness.

Thinking about this definition, how strongly would you agree that you have experienced a depressive disorder during your lifetime?

- Not at all
- Somewhat Agree
- Strongly Agree

If a participant indicated not at all they were skipped to the next disorder. If a participant indicated one of the other two categories they were asked:

At what age were you (in years) when you first experienced a depressive disorder?

Followed by:

Thinking about that time in your life when you first experienced a depressive disorder, please indicate how much each statement below applied to you at that time.

The seven-item depression scale from the DASS21 was then presented.

The final section of the questionnaire contained measures of impulsivity which have shown some relationship with problem gambling, antisocial personality disorder (APD) and borderline personality disorder (BPD) (Lawrence, Luty, Bogden et al., 2009;

Whiteside & Lynam, 2001). With regard to APD and BPD there was a lack of 'pencil and paper' type screening tests for these disorders in prior research and measurement has tended to be undertaken via structured clinical interviews. This presents a problem for an online or telephone based questionnaire in terms of cost and efficiency. A review of the literature on APD and BPD revealed that core symptoms of both are impulsive behaviours and the impulsivity trait has also shown a relationship with gambling behaviour (Blaszczynski, Steel & McConaghy, 1997; Haw, 2009; Steel & Blaszczynski, 1998). In fact, the DSM-IV has 18 separate disorders that include criteria related to impulsivity. However, this ubiquitousness has seen the conceptualisation of impulsivity lose specificity and a variety of scales have been constructed in the past 35 years designed to measure it (Whiteside & Lynam, 2001).

To address this Whiteside and Lynam (2001) created the four factor UPPS scale from analysis of nine separate impulsivity scales. These included the very popular scales of impulsivity such as the Eysenck Impulsiveness Scale, the Barrett Impulsivity Scale and the impulsiveness sub-domain from the NEO - FFI. The four facets of impulsivity that make up the UPPS are Urgency (strong impulses particularly under conditions of negative affect), a lack of Premeditation (low tendency to think and reflect on consequences), lack of Perseverance (inability to remain focussed on some tasks) and sensation seeking (openness to exciting experiences). Whiteside et al. (2005) examined these four facets in relation to problem gambling (measured by the South Oaks Gambling Screen: SOGS), APD and BPD (participants diagnosed and receiving treatment). Significant positive relationships were found between problem gambling, APD and BPD. Furthermore, a series of analyses indicated that the Urgency and (lack of) Premeditation facets were significantly related to APD, BPD and problem gambling and the Sensation seeking facets was significantly related to APD. Hence, these three impulsivity facets, Urgency (12 items), Premeditation (11 items) and Sensation seeking (12 items) were included in the final questionnaire.

The UPPS was later expanded to include another facet of impulsivity called Positive urgency (UPPS-P). This represents strong impulses under conditions of positive affect and during its validation it was shown to positively correlate with problem gambling (Cyders, et al., 2007). The current study also utilised this 14 item scale although its relationship to APD and BPD is largely theoretical (Cyders & Smith, 2008).

Impulsivity is considered a trait that develops early in a person's life and is relatively stable across the lifespan. For this reason, the age of onset question was not asked for

each impulsivity facet, but rather the four scales were administered without a time frame and participants were asked to think in general how strongly each item applied to them (as per the UPPS-P instructions). In any model of problem gambling, the impulsivity facets would be assumed as predictors of problem gambling rather than being predicted by problem gambling.

The treatment sample data were organised using both descriptive and multivariate statistics. Tables explaining the frequency and severity of the age of onset for each disorder were presented for participants who 'somewhat agreed' or 'strongly agreed' that they had experienced the subject disorder. Chi-square statistics were then calculated to compare the age of onset (before/same year/after) of the disorder with gender. The major dependent variable was the frequency or counts of participants who fell into each group. The chi-square statistic was augmented with a Cramer's V coefficient as a measure of the strength of the association between gender and temporal sequencing and adjusted standardised residuals reported to identify cells with significant differences between the observed and expected frequencies. Following this, ANOVA was used to analyse the mean number of years between the first onset of problem gambling and the first onset of the other disorder. In some cases the limitations of the data required that independent samples t-tests be used. Regression modelling showed how the impulsivity facets can predict problem gambling.

1.2.4 Stage 4: Time 1 of the National Telephone Survey

Stages 4 and 5 comprised national telephone surveys of regular gamblers at two points in time 12 months apart (Time 1 and Time 2 respectively). The aim was to obtain longitudinal data from 620 regular gamblers at Time 1, assessing changes in levels of problem gambling and other mental health issues. The sample size was estimated based on a 37.5% drop-out between Time 1 and Time 2. This would allow for a final sample size of 388 which is large enough to statistically test a model of the temporal relationships between problem gambling and the other disorders.

The questionnaire for Stage 4 (Appendix B) was almost identical to that used in Stage 3. However, recruitment was via random digit telephone dialling and administered by a market research company with experience in problem gambling surveys. Participants were required to be over 18 years of age and were initially asked if they would like to answer some questions about popular gambling activities. If agreeing to participate they were then asked their frequency of gambling in the past 12 months across seven forms of gambling associated with problem gambling (EGM's, horse and greyhound

racing, Keno, Sports betting, casino games in venues or on the internet, private gambling such as cards). These were tallied electronically and if the frequency of gambling across the seven forms totalled less than 52 times per year the participant was thanked for their time and the interview terminated. This was in keeping with the study's definition of regular gamblers being people who played these forms of gambling on average once per week.

If the frequency of gambling per year was greater than or equal to 52 times per year, participants were provided with more information about the study and in particular the longitudinal component. They were informed that they would be offered a \$30 Caltex voucher for completion of the current telephone survey and approval to call them again in 12 months time for the second phase. At the completion of the second phase they would be offered a further \$20 voucher. All participants who agreed to the initial gambling activity questionnaire agreed to continue with the study (however, there were 10 who declined to provide their postal address for the vouchers).

Data for this stage was analysed using a combination of descriptive and multivariate statistical tests.

Stage 4 was budgeted for a total sample size of 620 regular gamblers and was based on an estimated response rate of 10% for the 25 minutes questionnaire. With a slight reduction in response rate (9%) and an increase in questionnaire length (just over 30 minutes) concerns were raised by the market research company that the budget would be met after the recruitment of 450 - 500 regular gamblers. To minimise the extra cost associated with achieving a total of 620 the decision was made to call back those who had agreed to participate in the study but had a total frequency of gambling less than 52 times per year. This was undertaken in descending order of frequency to try and include a greater proportion of the higher frequency gamblers. The result of this strategy had two effects. First, there was just under 25% of the sample (N=153) who did not fit the original definition of regular gambler and their frequency of gambling ranged from 50 times per year to 26 times per year across the seven forms of gambling. Second, the sampling strategy had changed before gender and location quotas were implemented and this had the effect of varying the distributions of these variables from the population (e.g., there were 57% men in the final sample rather than 50%). Chapter 6 describes the sample in greater detail.

Compared to the online version of the questionnaire, the scales used were identical but there were a number of structural changes made. These were made primarily due to

the different analysis to be undertaken with the scales and the longitudinal component. All 620 in the national telephone sample were given the individual scale first, using a 12 month time frame. This is because Time 2 was a 12 month follow-up of all participants and changes in the disorders could be temporally assessed (not required for Stage 3). After this, participants were then asked if they had experienced the disorder at any time during their lifetime. They were not provided with a definition of the disorder, as they had just completed the scale and it was believed that this would provide them with enough information to satisfy as a definition of the disorder. For example, participants completed the seven-item depression scale using a 12 month time frame. They were then asked:

The next statement is more general and applies to you at any time during your lifetime, not just the past 12 months... At any time over your lifetime, have you ever felt you might have a serious problem with depression? (If necessary: by serious I mean considered seeking treatment for your depression).

Participants were allowed to generate their own response but if necessary were prompted with:

Would that be 'No, not at all' or 'Yes, at some time'?

If the response indicated no agreement, the participant was skipped to the next disorder. If the response indicated some agreement then the participant was asked at what age they were when they first felt this.

At the end of the questionnaire participant contact details were recorded for distribution of the voucher and for Time 2. Recruitment took place from the last week in October, 2010 until the first week of December, 2010.

Descriptive information was initially used to explore the data obtained from the community sample, including explorations of severity and age of onset of each disorder by gender. As with the treatment sample it was then intended to use several 2 x 3 chi-square and MANOVA or factorial ANOVA tests to explore the temporal relationship between age of onset of each disorder with problem gambling. However, with a smaller sample size of problem gamblers the assumptions of these tests were not met for many of the mental health variables. Where appropriate, descriptive statistics were instead performed and interpreted. Regression models were able to be produced for the impulsivity facets and problem gambling status according to gender.

1.2.5 Stage 5: Time 2 of the National Telephone Survey

Stage 5 required re-contacting the 620 participants from Stage 4 by the market research company administering the questionnaire. This occurred across the month of November, 2011. The questionnaire was a much briefer version of the Stage 4 questionnaire as it did not need to include questions regarding demographics, lifetime experiences with disorders or the impulsivity facets. It commenced with the same questions regarding frequency of gambling, then the PGSI, the depression and anxiety scales, alcohol abuse, nicotine dependence and drug abuse. This saw the questionnaire time reduced to an average of around 12 minutes and participants received a \$20 voucher upon completion. Given the reduced questionnaire length from an anticipated 15 minutes, a greater number of participants were recruited within the budget. Originally, it was expected that the final sample would contain 388 participants, but this was increased to 455 whilst remaining within budget.

The 455 participants who were included in Time 2 were generally representative of the original 620. In relation to gender, age and location they were similar however they did tend to be less frequent gamblers and to have lower levels of problem gambling. This was perhaps due to the sampling procedure which saw the more easily contactable (i.e. probably less frequent) gambler included in the follow up stage at the expense of those who may actually have been out gambling and who were difficult to make contact with. Each participant's responses were given a unique identifier which was matched with Time 1 to create the longitudinal data set.

The analyses for this chapter commenced with a comparison of key descriptive variables, including PGSI status and disorder severity, between the Time 1 and Time 2 community samples. An analysis of each temporal sequence model was then performed with structural equation modelling (SEM). This approach considered issues such as error variance, collinearity, and the discriminant and concurrent validity of the measures whilst providing standardised coefficients that could be directly compared. The SEM allowed testing of the hypothesis that:

Problem gambling at Time 1 has a significantly different relationship with each co-morbid disorder at Time 2 than depression at Time 1 has with problem gambling at Time 2.

Standardised co-efficients were presented that compared these Time 1 and Time 2 relationships according to gender.

1.2.6 Stage 6: Expert interviews on public health strategies

For Stage 6 advice was sought from a range of experts on the best public health strategies for use in the mental health and addiction sectors. While senior mental health and gambling experts from all states and territories were invited to participate in Stage 6 of the study, there were no responses from key experts in the ACT or the Northern Territory. Positions held by respondents included mental health director, co-ordinator or manager, community education and health promotion manager.

Each key contact was provided with a brief overview of the study's results, followed by a semi-structured telephone interview of 30-60 minute duration. The interviews were structured around the following key issues related to relevant public health strategies:

- Prevention and early intervention of problem gambling and co-morbid mental health disorders;
- Community education and health promotion around problem gambling and co-morbid mental health disorders;
- Education and training of service providers;
- Individual, family and community awareness of co-morbid issues and appropriate services;
- Co-morbid research and the evaluation of treatment services;
- Collaboration between mental health services (e.g., GP's, specialist services and government departments); and
- Funding priorities.

These interviews were analysed thematically in order to identify the strategies mental health experts consider to be the best for public health use in the mental health and addiction sectors.

1.3 Summary of the approach to this project

This research was commissioned by Gambling Research Australia in order that key co-morbidities complicit in the development and maintenance of problem gambling could be explored and appropriate public health strategies considered. A sequential, mixed methods research design was applied in order to effectively address these research questions. Using both qualitative and quantitative techniques a range of participants including: counsellors and therapists from gambling and mental health services;

gamblers in counselling; regular gamblers in the community were surveyed and public health experts interviewed.

Qualitative data were analysed thematically and the results retested on increasingly specialised samples of clinical practitioners and experts. These findings informed the design of the CATI questionnaire administered to gamblers in treatment (N=267) and the Time 1 regular gamblers (N=620) in the community. A key feature of the community survey was a second (Time 2), longitudinal stage of data collection (N=455) that occurred approximately 12 months after the Time 1 survey.

While the researchers were able to survey a greater number of participants at Time 2 than originally intended, there were some limitations in terms of the under-representation of problem gamblers in this second round of data collection. Nonetheless, a large and robust sample of respondents was obtained and the results of the quantitative analyses were able to be discussed with the public health experts (N=18) interviewed in Stage 6 of the project. The results of each of these Stages are presented in the following Chapters.

Chapter 2 Literature Review

2.1 Introduction

It has been estimated that between 90,000 and 170,000 Australian adults experience significant harm from their gambling (Productivity Commission, 2010). This is based on a conservative estimate of the prevalence of problem gambling being 0.5 per cent to 1.0 per cent of the adult population. The Productivity Commission (2010) also noted that many more gamblers experience difficulty controlling their gambling without satisfying the full criteria for problem gambling and that prevalence estimates can be problematic for a number of reasons.

One issue with estimating the prevalence of problem gambling is the time frame used, with some studies using point prevalence (the number of cases at a specified point in time or past 12 months) as opposed to life-time prevalence (the number of cases that have had the condition over their life-time) (Thomas & Jackson, 2008). These differences subsequently result in a variation of the number of people thought to be problem gamblers within a population. Abbott (2001) noted that earlier Australian studies have not included the lifetime scale and Battersby et al. (2006) questioned the validity of point prevalence findings. Furthermore, the way a study is administered and described (Williams & Volberg, 2009) along with other sampling and measurement issues (Lesieur, 1994; Petry & Weinstock, 2007; Raylu & Oei, 2002; Thomas & Yamine, 2000) have been raised as factors that may lead to the underestimation of problem gambling in the community.

What is known from the gambling research literature is that problem gamblers have high rates of co-morbidities that include alcohol and drug use, depression, anxiety disorders and other mental health problems (Cunningham-Williams et al., 2000; Lorains, Cowlshaw & Thomas, 2011; Momper, Delva, Grogan-Kaylor, Sanchez & Volberg, 2012; Productivity Commission, 2010; Thomas & Jackson, 2008). In New South Wales (NSW), for example, of people seeking help for gambling problems, 43 per cent reported having at some stage been diagnosed with an anxiety disorder, 55 per cent with depression, 29 per cent with alcohol problems and 19 per cent reported problems with other drugs (Productivity Commission, 2010). Indeed, according to Delfabbro (2008:3) present estimates suggest that between 60 per cent and 80 per cent of problem gamblers experience significant depression, anxiety disorders and suicide ideation. In addition, approximately 15 per cent to 20 per cent of problem

gamblers are estimated to be affected by substance abuse (Delfabbro, 2008). The existence of co-morbidity may be an influencing factor in the severity of disordered gambling, along with identifying the best treatment protocol and reducing the possibility of relapse (Ibanez et al., 2001).

2.2 Scope of the review

The aim of this review is to examine the gambling literature pertaining to problem gambling and co-morbid disorders. Preference for inclusion has been given to Australian and recent studies (i.e. from 2000). However, international literature and older studies are also included where relevant.

The primary methods used to obtain relevant literature for this review included searches conducted on health and social research literature databases as well as searches by name of published gambling and co-morbid researchers. A variety of search strategies were utilised in order to capture various terms used for problem gambling in the literature including gambling, pathological gambling and compulsive gambling. Databases searched included:

- PsycInfo
- Medline
- CINAHL
- Current Contents
- Australian Family and Society
- Google Scholar
- Emerald
- ProQuest 5000
- Embase

Web-based searches were also conducted to identify other material not available through peer reviewed journals including the grey literature concerning co-morbidity and problem gambling. Websites searched included Australian government websites as well as relevant international government websites and conference proceedings papers. These included the:

- Department of Health and Ageing
- Mental Health Council of Australia
- Australasian Gaming Council
- Gambling Research Australia
- Victorian Commission for Gaming Regulation
- Queensland (QLD) Office of Liquor, Gaming and Racing
- NSW Office of Liquor, Gaming and Racing

- Independent Gambling Authority of South Australia

Thus, this review is essentially concerned with various prevalence studies of co-morbid mental disorders with problem gambling as well as the temporal relationship between problem gambling and other co-occurring disorders. Literature concerning the presence of a particular morbid condition, or a series of co-morbidities that may predict the development of problem gambling, is also emphasised.

2.3 Structure of the review

The review begins with definitions and discussion of the term 'co-morbidity'. Definitions and discussion of the term 'problem gambling' and an explanation about various ways of determining the prevalence of problem gambling within a set population follows. Prevalence studies of co-morbid mental disorders with problem gambling are then discussed, with studies divided into community and treatment sampling. Studies concerning co-morbid disorders and problem gambling are included for each disorder and for each sampling type under the following headings:

- Depression and problem gambling
- Depression, suicide and problem gambling
- Anxiety disorders and problem gambling
- Alcohol dependence and problem gambling
- Nicotine dependence and problem gambling
- Other substance dependence and problem gambling
- Other disorders and problem gambling including personality disorders and schizophrenia.

Following these sections, confounding variables are then discussed. This includes gender, culture and ethnicity, and age. Finally, studies that have explored the temporal sequencing (predictors) of problem gambling and co-morbidity are addressed.

2.4 Co-morbidity

For the current project, co-morbid disorders was defined as any number of Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) of the American Psychiatric Association (2000) recognised mental disorders that co-occur with problem or pathological gambling in the same individual. Hence, co-occurring behaviours that are

sometimes reported in the literature as co-morbidities (i.e. crime, domestic violence etc.) were not included.

There has been considerable debate about the appropriate terminology and definitions for the co-existence of mental disorders and gambling problems. Westphal and Johnson (2007:75) noted that 'there is no universally accepted definition of co-occurring disorders and no comprehensive and coherent theoretical framework for studying co-occurring disorders in mental health'. This lack of consistent definition for co-morbidity is in no way trivial (Teesson & Byrnes, 2001) and the terms commonly used to describe the co-occurrence of one or more diseases or disorders in an individual include co-morbidity, multi-morbidity and dual diagnosis.

Co-morbidity is defined by Britt et al. (2008:72) as 'the existence or occurrence of any distinct additional disease entity in a patient who has the index disease under study'. More recent interest is in the mix of morbidities (multi-morbidity), defined by Britt et al. (2008:72) as the 'co-occurrence of two or more diseases within one person without defining an index-disease'. The term 'dual diagnosis', however, refers solely to people who are affected by both mental illness and substance use (Mental Illness Fellowship of Australia, 2005; SANE Australia, 2009). According to the NSW Department of Health (2008:4) co-morbidity 'delineates the co-occurrence of symptoms or disorders while dual diagnosis is appropriately used to identify a closer relationship between two conditions, perhaps including cause or effect'. The Department of Health (2008) prefers the term dual diagnosis, as co-morbidity does not necessarily imply a causal relationship between conditions. In Australia, the favoured term for gambling research concerning mental disorders that co-occur with problem gambling is 'co-morbidity' (Gordon, 2008).

2.5 Problem gambling

Australia is the only country to have a commissioned national definition for problem gambling. This was defined by Neal, Delfabbro and O'Neil (2005:125) as 'difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community'. To elaborate, Thomas and Jackson (2008:4) point out that 'it is when the financial resources are insufficient to meet the requirements of the gambling activities that the major identifiable problems and consequences become apparent'. Shaffer and Korn (2002) argued that gambling exists on a behavioural continuum ranging from no gambling to a great deal of gambling. As Thomas and Jackson (2008) pointed out, the continuum concept highlights the arbitrary

nature of status categories such as 'at-risk gambling', 'problem gambling' and so forth. Rather, its usefulness exists when considering treatment strategies and interventions for problem gamblers including, for example, the range of brief or intensive treatments and measures for harm reduction and relapse (Shaffer & Korn, 2002).

Various terms have been used in the international literature to describe people who have developed gambling problems. For example, the American Psychiatric Association [APA] (2000) uses the term 'pathological gambling' rather than the preferred Australian term of 'problem gambling'. The APA currently considers problem gambling to be an impulse-control disorder with the essential features being 'persistent and recurrent maladaptive gambling behaviour...that disrupts personal, family or vocational pursuits' (2000:673). However, Millar and Holden (2010) note that the revised version of the DSM (DSM-V) is proposing that pathological gambling be considered a 'behavioural addiction'. 'Compulsive gambling' is another term that has been used for problems related to gambling however as with the term 'pathological gambling' it has been argued to be 'potentially misleading when applied in the Australian context' (Delfabbro, 2008:58). For example, obsessive-compulsive disorders differ from addictions and are generally based on negative reinforcement while gambling is usually motivated by the wish for positive reinforcement or outcomes (winning money). The term 'pathological gambling' has been argued as problematic in Australia because it takes the view that gambling is a medically based disorder (the disease model) which has similarly not been consistently found to be the case in Australian research (Delfabbro, 2008).¹

The Productivity Commission (2010) noted that there are issues in categorically defining problem gambling and that this is a common difficulty for many other public health issues. However, Westphal and Johnson (2007:73) point out that this approach is needed as the relevance of co-morbid disorders and their evaluation to a public health model of gambling 'will derive from their contribution to the development of a comprehensive model of how gambling progresses to a behaviour that causes harm...'

¹ Given that the term used to describe problems with gambling varies in the international literature (e.g. 'pathological gambling' used by the American Psychiatric Association), the term used in the source document will, in general, influence the term used in this review.

In addition, thresholds on a continuum can be useful for identifying people who ought to moderate their gambling behaviour, or for identifying subpopulations that may be at risk of more severe problems, so that harm minimisation strategies can be instigated (Productivity Commission, 2010).

From a public health perspective, harm minimisation strategies usually aim to reduce the prevalence, and negative consequences, of problem gambling. They do this by promoting informed choice through the dissemination of information which discourages excessive gambling (Lepper & Creigh-Tyte, 2006). An effective strategy informs at-risk community members about the harm caused by excessive gambling, while ensuring that the enjoyment of recreational gamblers is not affected. Derevensky and Gupta (2007:454) stated that the 'harm reduction/minimisation approach includes strategies, policies or programs that have been designed to promote temperance and responsible gambling without requiring abstinence'. Abbott et al. (2004:20) noted that the 'overall goal of harm reduction is the prevention of harm rather than the prevention of use or involvement *per se*'. Similarly, Shaffer and Korn (2002) argued that harm minimisation is an appropriate public health response to relatively serious gambling problems. They claim that the effectiveness of harm minimisation starts where straightforward health promotions stop being effective. Thus, harm reduction is potentially a helpful approach when dealing with moderate gambling problems and assists treatment when dealing with severe problems.

Current public health promotion research highlights the need for a holistic approach to prevention and harm minimisation strategies (Sheedy, 2006). Such public health strategies include primary, secondary and tertiary interventions (Derevensky & Gupta, 2007). Primary interventions are those designed to prevent the development of gambling problems and include community education campaigns, changes to gambling advertising, the provision of safe-gambling messages, or the removal of gambling inducements. Secondary interventions assist gamblers once they are exposed to gambling (e.g., in venues) and include restricting the accessibility of gambling, strategies to encourage greater awareness of gambling expenditure, social policies, modifications to gaming machines, and interventions involving assistance from staff at gambling venues. Tertiary interventions involve treating problem gamblers once people have been affected, such as counselling services that usually include a combination of financial counselling, relationships counselling, legal advice and various therapeutic interventions (Delfabbro & LeCouteur, (2003).

Abbott and Clarke (2007) highlighted that there are various models that have been put forward in the contemporary gambling literature to explain the various factors for how an individual becomes a problem gambler. These include physiological, biological and/or psychological predispositions and attributes, stressful experiences and negative emotional states, and behavioural factors. For instance, within the public health model emphasis is placed on a range of social and environmental factors while a clinical model focuses more on internal biological, emotional, cognitive and behavioural factors (Abbott & Clarke, 2007). Blaszczynski and Nower (2001) argued that traditional models of pathological gambling, such as those concerning addictions, psychodynamic, psychobiological, behavioural and cognitive approaches, share common elements. For instance, they all acknowledge the 'interaction of key biopsychosocial variables in the aetiological process' (Blaszczynski & Nower, 2001:489). However, each model places importance on a different operative factor to account for the progress from initial participation in gambling to a problem with gambling, which Blaszczynski and Nower (2001) argued is too restrictive as gamblers are not a homogenous group. Rather, the 'Pathways model', developed by Blaszczynski, incorporates the 'complex array of biological, personality, developmental, cognitive, learning theory and ecological determinants of problem and pathological gambling' (Blaszczynski & Nower, 2001:487).

Gambling researchers tend to identify problem gamblers by drawing on a range of psychometric measures. Indeed, Abbott and Volberg (2006) noted that there are over 20 problem gambling screens. These include the DSM-IV diagnostic criteria for pathological gambling, the South Oaks Gambling Screen (SOGS), the Victorian Gambling Screen (VGS) and the Problem Gambling Severity Index (PGSI) contained within the Canadian Problem Gambling Index (CPGI). Certain measures are used in particular types of studies. For example, the PGSI was developed for use in community prevalence studies and presents a continuum of risk scores that range from problem gambling, moderate risk gambling, low risk to no risk. In the PGSI, questions used to measure problem gambling concern behaviours or experiences at different frequencies, ranging from never, sometimes, most of the time to almost always.

2.6 Prevalence studies of co-morbid disorders with problem gambling

2.6.1 Community and treatment sampling

There are two populations that are commonly sampled in studies assessing the prevalence of co-morbid disorders with problem gambling. These are the community and treatment populations. It is important to recognise that this distinction is inclined to elicit different results and tend to be used for different purposes. For instance, the Productivity Commission (1999) stated that, while community studies are likely to provide fairly accurate estimates of substance use (e.g. smoking and alcohol use) in regular gamblers, they might not reveal the full range of the issue being investigated. One reason for this is that problem gamblers are less likely to respond to telephone surveys. Community studies usually select a random sample of the community for brief surveys, generally telephone based (Westphal & Johnson, 2007), and they are expensive to carry out. Treatment samples, by comparison, use a non-random sample of participants receiving treatment. Lorains et al. (2011) noted that studies concerning problem gambling and co-morbidity rely heavily on evidence from treatment seeking samples.

Evans and Delfabbro (2002) argued that findings from community samples are likely to include less severe cases of problem gambling, while treatment samples are likely to include more severe cases; problem gamblers often do not seek help until they have reached a crisis point. Community studies may therefore understate the full extent of problem gambling within a population. Conversely, treatment samples are likely to include a high percentage of serious cases. However, Westphal and Johnson (2007) argue that community studies and treatment samples can be complementary, as community samples provide representative evidence for associations of problem gambling and other mental disorders, while treatment samples provide evidence for associations at defined levels of severity. Furthermore, both sampling types of studies are needed to obtain causal interpretations.

Discussed in the sections below are various dependence disorders (i.e. alcohol and other drug dependence, including nicotine dependence) as well as various mental disorders including depression and anxiety disorders. The prevalence of co-morbid disorders with problem gambling involving community sampling studies are reviewed first, followed by studies that have involved treatment samples.

2.6.2 Co-morbidity in community samples

Petry, Stinson and Grant (2005) conducted a study in the U.S. concerning the co-morbidity of pathological gambling and other psychiatric disorders. Pathological gambling was assessed using DSM-IV criteria. They looked at results from the National Epidemiological Survey on Alcohol and Related Conditions which is a U.S. based national community study of 43,093 adults. The diagnostic tool used was the National Institute on Alcohol Abuse and Alcoholism Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV. The Schedule covered a range of mental disorders, as well as behavioural disorders, with the lifetime prevalence rate of pathological gambling found to be 0.42 per cent. Other results included: 73.2 per cent of pathological gamblers had an alcohol use disorder; 38.1 per cent had a drug use disorder; 60.4 per cent had nicotine dependence; 49.6 per cent had a mood disorder; 41.3 per cent had an anxiety disorder; and 60.8 per cent had a personality disorder. It was noted that these findings were representative across all major demographic groups (Petry et al., 2005). Petry et al. (2005:574) concluded that pathological gambling is 'highly co-morbid with substance use, mood, anxiety and personality disorders'. However, the study did not address the temporal sequencing in relation to the age of onset of problem gambling and its symptoms and co-morbid disorders.

Kessler, Hwang, LaBrie, Petukhova, Sampson, Winters and Shaffer's (2008) research reported on the temporal sequencing between age of onset (AOO) of pathological gambling and its symptoms of co-morbid disorders. They used data collected in the U.S. National Co-morbidity Survey Replication (NCS-R) which included 9,282 adults. This survey assessed the lifetime prevalence of pathological gambling as well as a range of other mental disorders and substance use disorders. It utilised retrospective age of onset information for each disorder. This analysis suggested that 'other disorders typically predate the onset of pathological gambling and predict the subsequent onset and persistence of pathological gambling' (Kessler et al., 2008:1358). They noted that these associations are particularly significant for mood and anxiety disorders, while associations with substance abuse disorders are primarily due to pathological gambling predicting subsequent substance use disorders.

In Canada, Brooker, Clara and Cox (2009) conducted a prevalence study with a subsample of 742 participants chosen from the Canadian Community Health Survey. The study examined the severity of gambling behaviour in the general population using the CPGI and subsequently looked at associations with past-year co-morbidity. The

subsample of participants (n=742) showed moderate to high risk gambling behaviour and a risk of co-morbid mental health disorders. Essentially, the study found that people with problem gambling behaviour in the general population had various associated mental disorders, particularly suicide ideation, social phobia, mania, depression and alcohol problems.

In Australia, Hayatbakhsh, Najman, Aird, Bor, O'Callaghan, Williams, Shuttlewood, Alati and Heron (2006) undertook a study on the early life course determinants of young adults' gambling behaviour using data from a longitudinal study of maternal and child health that was first collected in 1981-1983 at the Mater Hospital, Brisbane. Hayatbakhsh et al. (2006) aimed to describe the prevalence of gambling behaviour and problem gambling in adolescents and young adults and explore the correlates and consequences of this behaviour. At the 6th follow up (2002-2003) the children were young adults of approximately 21 years old.

The authors highlighted the inter-relatedness of many of the social, environmental and psychological factors studied, and as such attempted to establish the independent risk of each (Hayatbakhsh et al., 2006). For example, they found a significant association between substance use, early exposure to alcohol and problem gambling behaviour, although there was no significant association between anxiety/depression and gambling prevalence at 14 years or 21 years. Overall, problem gambling prevalence rates among participants at the 21-year follow-up were similar to those in the general population (Hayatbakhsh et al., 2006). Where relevant, these will be discussed further within the following sections addressing specific disorders.

Depression and problem gambling

Depression is categorised in the DSM-IV (2000) as a mood disorder along with dysthymia and bipolar disorder. In the emerging research literature about links between problem gambling and mental disorders, in particular depression, Blaszczynski and Farrell (1998) found that depression was the most prevalent co-morbid disorder among problem gamblers. In more recent years, Thomas and Jackson (2008) added that subsequent national and international studies have reported similar relationships between problem gambling and depression. For instance, the Queensland Household Gambling Survey (QHGS) (2003 - 2004), which is based on data provided by more than 30,000 people from all areas of Queensland, found that 47 per cent of problem gamblers reported having felt seriously depressed in the previous year, with nearly as many having been under a doctor's care for stress related issues. In the Productivity

Commission Report (1999) it was noted that 22 per cent of problem gamblers reported either 'often' or 'always' having experienced depression that was associated with gambling. The South Australian Department of Human Services (2001), using the Kessler-10 (K10) screen for non-specific psychological distress, found that 59 per cent of problem gamblers scored in the clinical range for depression.

A project conducted by Thomas and Jackson (2008) concerned risk and protective factors about depression and co-morbidities in problem gambling. It looked at factors for problem gambling at the individual level, the family level, the community level, as well as policy and practice levels. Emphasis was on the role of depression and related psychological and behavioural problems in relation to problem gambling. In addition, the study was concerned with investigating other co-morbidities that are often associated with problem gambling including alcohol and drug use. A random digit dialling survey methodology was used to survey 2012 Victorian residents and various tools were used including: the Canadian Problem Gambling Index (CPGI); Kessler-10 (K10) for general mental health; 2 item depression screen tool; and WHO-AUDIT alcohol use tool. The study found a clear association between people with gambling problems and a series of psychological and behavioural co-morbidities. Problem gamblers were found to have a relative risk of 18.8 for a 'severe mental disorder' - as defined by their K10 scores (ie. almost 19 times the average risk for the population). Using the 2 item depression screen, a risk of having a severe mental health disorder of 2.4 was found. In absolute terms, the study found that 35.7 per cent of problem gamblers have a 'severe mental disorder'. The rate of being 'at risk of depression' in the problem gambling group was 71.4 per cent (Thomas & Jackson, 2008). They noted that, by identifying risk and protective factors, high-risk groups can be targeted for early intervention. However, and significantly relevant to this current study, Thomas and Jackson (2008:ix) point out that it is not possible to establish a causal nexus between problem gambling and the above co-morbidities - it is unknown 'whether one set of conditions precedes the other nor whether they are causally linked'. This supports Kim, Grant, Eckert, Faris and Hartman's (2006) findings from their study about pathological gambling and mood disorders. Kim et al. (2006) claim there are inconsistent findings that relate to the primary or secondary nature of the relationship between problem gambling and depression.

While there have been community studies that have focused on depression, McIntyre et al. (2007) note that there are relatively few studies that have reported on the prevalence, and associated characteristics, of problem gambling with bipolar disorder.

To fill this gap, McIntyre, McElroy, Konarski, Soczynska, Wilkins and Kennedy (2007) used data from the Canadian Community Health Survey on Mental Health and Well-being, conducted by Statistics Canada, to explore the prevalence of problem gambling amongst people with bipolar disorder. The sample consisted of 36,984 Canadians. The study found that, compared to people without bipolar disorder, the odds of problem gambling for people with bipolar disorder were over twice as high (OR = 2.3; 95% CI 1.4 - 3.7).

Depression, suicide and problem gambling

Feigelman et al. (2006) claim it is well documented that all manifestations of suicidality are far more common among severely depressed people. In addition, studies have found evidence of higher risks of suicide and suicidal ideation among those meeting the criteria for problem gambling (Kausch, 2003a; Maccallum et al., 1999; Petry & Kiluk, 2002). Hoogland and Pieterse (2000:online) stated that 'problem gambling, with its potentially devastating impacts on the finances, personal lives and relationships of the affected gamblers, is related to heightened anxiety, depression, and in extreme cases, to suicide'. Of the significant adverse consequences of problem gambling, suicidal behaviour is undoubtedly the most serious. While the exact rate of gambling related suicides is hard to determine, it was estimated by the Productivity Commission (1999) that 1.7 per cent of suicides in 1997 were gambling related. Clearly, mental disorders, especially depression, are major risk factors for suicidal behaviour (Battersby, Tolchard, Scurrah & Thomas, 2006). Battersby et al., (2006:234) further state that 'pathological gambling is inextricably linked to co-morbid mental illness, both as a cause and an effect, and would be expected to raise the risk of suicide, whatever the direction of causality'. However, Feigelman et al. (2006) make the point that most research in relation to suicide and problem gambling has been conducted among treatment populations. Importantly, they point out that it remains unknown if respondents in the community who are less troubled by gambling problems will show the same patterns of suicidality as found among treatment samples.

In their Australian study of 1,601 people - ranging in age from 21 years to 79 years - applying for self-exclusion, Nower and Blaszczynski (2008) found that almost 14 per cent of older adults surveyed indicated they had sought assistance from a mental health professional due to a desire to prevent suicide. Older adults were found to be nearly three to four times as likely to identify the potential for suicide as a reason for seeking help than younger people (Nower & Blaszczynski, 2008). Nower and

Blaszczynski (2008) note that factors such as gambling to combat loneliness, feelings of social isolation, and other psychiatric problems are particularly relevant to the risk of suicide in older adult gamblers.

Anxiety disorders and problem gambling

According to the DSM-IV (2000) there are various disorders that fit into the category of anxiety disorders. These include: Generalised Anxiety Disorder (GAD); Panic Disorder; Panic Disorder without Agoraphobia; Panic Disorder with Agoraphobia; Social Phobia; Obsessive Compulsive Disorder (OCD); and Post Traumatic Stress Disorder (PTSD).

Studies conducted using community samples to explore anxiety disorders among problem gamblers have generally found higher levels of anxiety among problem gamblers compared to the general population (Kessler et al., 2008; Lorains et al., 2011; Petry et al., 2005). Kessler et al. (2008:1358), for example, found clear associations between problem gambling and mental disorders, particularly significant for mood and anxiety disorders. Canadian studies concerned with problem gambling and mood disorders, including a wide range of anxiety disorders, have found similar results (Cox et al., 2005; Ladouceur et al., 2005; Petry et al.'s (2005). Findings from a U.S. based national study of 43,093 adults, indicated that 41.3 per cent had an anxiety disorder. In addition, they found statistically significant positive associations between pathological gambling and various anxiety disorders with panic disorder (with or without agoraphobia) being especially strongly linked. In an earlier study Bland, Newman, Orn and Stebelsky (1993) found a higher rate of agoraphobia amongst pathological gamblers compared to non gamblers.

Alcohol dependence and problem gambling

Several Australian studies have found a link between gambling and different forms of substance dependence; in each of these studies, alcohol abuse was identified in about 20 per cent of problem gamblers (Dickerson et al., 1996; Maccallum & Blaszczynski, 2002). Using the WHO-AUDIT tool, Thomas and Jackson (2008) concluded that the 'likely hazardous alcohol use' amongst problem gamblers was 50 per cent.

Hayatbakhsh et al. (2006) have noted that alcohol abuse is the best documented co-morbid diagnosis in the gambling literature. The link between gambling and alcohol use was explored in their Mater Hospital - University of Queensland longitudinal study. Those who reported drinking at less than 14 years of age were more likely to be gamblers at the age of 21 years (47 per cent vs. 15 per cent). Differences also

emerged when young people were classified according to the CPGI. Those who did not drink alcohol were more likely to score more than zero on the CPGI than those that did drink, but CPGI scores were higher in those who reported mild to severe use of alcohol (Hayatbakhsh, et al. 2006).

Similarly, in the international literature alcohol has been found to be the most commonly abused substance by problem gamblers (Abbott, 2001; Petry et al., 2005; Shaffer & Korn, 2002). As part of their study conducted in the U.S., Petry et al. (2005) found that 73.2 per cent of pathological gamblers had an alcohol use disorder. One of the earliest community studies was the gaming survey 'Gambling and Problem Gambling in New Zealand' (Abbott & Volberg, 1991). It found high rates of non-psychotic mental disorders and hazardous drinking in self-reported problem gamblers. Furthermore, studies have found that people report having a stronger urge to gamble while using alcohol, as well as finding it more difficult to stop gambling (Baron & Dickerson, 1999; Productivity Commission, 2010; Westphal & Johnson, 2007).

Nicotine dependence and problem gambling

Nicotine dependence is included in the DSM-IV (2000) under the general definition of substance dependence. The DSM-IV definition of nicotine dependence has the following criteria: tolerance; withdrawal; used in larger amounts over longer periods; unsuccessful attempts to cut down/cease; considerable time spent obtaining, using, recovering from effects; important social, occupational, recreational activities are stopped; and nicotine use continues despite the person realising that it is contributing to a psychological or physical problem (American Psychiatric Association, 2000).

As with alcohol use, community studies have found a high rate of increased tobacco use among problem gamblers. For instance, the South Australian Department of Human Services (2001) prevalence survey found that, while around 20 per cent of people in the community are regular smokers (daily), around 33 per cent of people who gamble regularly, and 60 per cent of problem gamblers are regular smokers. Similarly, Thomas and Jackson (2008) note that smoking daily was found to have a risk 3.8 times higher for problem gambling vs. non-problem gambling. The rate of being a daily smoker in the problem gambling group was 57.1 per cent (Thomas & Jackson, 2008). Thus, each of these studies found a clear association between smoking tobacco and problem gambling. However, these studies have predominantly looked at the association between smoking and problem gambling generally, rather than the DSM-IV defined nicotine dependence.

McGrath and Barrett (2009) similarly note there is evidence from community based studies and large epidemiological surveys to indicate that nicotine use and problem gambling often co-occur. Furthermore, McGrath and Barrett (2009) make the point that it may be feasible that psychological factors, such as conditioned effects, play a role in relation to the co-morbidity of smoking and problem gambling. Although there is no direct evidence that the exposure to a cue associated with either tobacco or gambling can increase the desire for another co-morbid addiction, McGrath and Barrett (2009) argue that it is possible that presenting cues that are associated with one form of dependence may act as a trigger for another. However, they identify the need for further research to examine the impact of co-morbidity on nicotine dependence and problem gambling to determine the dynamics of this relationship.

While not specifically addressing nicotine dependence, the longitudinal data analysed by Hayatbakhsh et al. (2006) which differentiated between smoking and 'heavy' smoking, included questions about whether the 3,700 participants gambled and smoked (at age 21). As with other studies, they found that participants who gambled are also more likely to smoke. Of participants who smoked 10 or more cigarettes per day, 52.8 per cent were gamblers in contrast to 35.9 per cent of those that did not smoke. When the same comparisons were made using CPGI scores, it was found that 37.5 per cent of heavy smokers scored > 0 on the CPGI as compared with only 7.5 per cent of non-smokers; if a person was a smoker, he or she was around five times more likely to gamble at the age of 21 years (Hayatbakhsh et al., 2006).

Petry et al. (2005) found that nicotine dependence - rather than smoking *per se* - is a commonly reported addiction (60.4 per cent) among problem gamblers. In addition, after consideration of the odds ratio for individual disorders, people with tobacco dependence were found to be 7 times more likely to be problem gamblers than non-smokers. Furthermore, tobacco dependence among problem gamblers was found to be associated with an increase in the severity of psychosocial problems such as anxiety disorders, along with additional substance abuse disorders.

Other substance dependence and problem gambling

Several community sample studies have attempted to explore the link between problem gambling and the use of other substances. As noted earlier, Petry et al. (2005) reported that 38.1 per cent of participants in their study were found to have a drug use disorder.

In a study of 2,700 Year 8 high school students in Melbourne, Jackson (1999) found that students who were more involved in gambling were also more likely to engage in behaviours such as alcohol use, smoking and other drug use. As part of the Mater Hospital and the University of Queensland longitudinal study, Hayatbakhsh et al. (2006) asked the 21 year old participants a series of questions relating to their use of substances other than alcohol or cigarettes. They found that substance use in young adulthood strongly predicted gambling expenditure. In addition, frequent use of cannabis and other illicit substances were found to be associated with greater gambling expenditure. Of participants who reported having smoked cannabis, 16.3 per cent were considered to be at risk gamblers which contrasted with 6.3 per cent of participants who were non-users. For frequent cannabis users, 25.6 per cent of participants were considered to be at risk gamblers which compared to 6.3 per cent for participants that did not use cannabis (Hayatbakhsh et al., 2006). Of participants who reported using other illegal drugs, 18.7 per cent were considered to be at risk gamblers which contrasted with 8.6 per cent of participants who did not use illegal drugs (Hayatbakhsh et al., 2006).

Age was also associated with problem gambling and substance use. Hayatbakhsh et al. (2006) found that the age that participants began using substances was strongly associated with gambling expenditure, concluding that: 'overall, those who started ... using cannabis under the age of 15 years reported spending more money on gambling in young adulthood than those who commenced substance use at an older age or who had never used these substances' (Hayatbakhsh et al., 2006:2).

In a community prevalence survey conducted by the South Australian Department for Human Services (2001), participants were asked questions about their use of substances other than alcohol and nicotine. It was found that problem gamblers were more likely than non-problem gamblers to use non prescription drugs as well as various prescription medications. In a follow-up study by the South Australian Department for Families and Communities (2006) involving 17,140 people, similar questions were asked. Findings showed that marijuana and other illegal drug use was no higher in those who were identified as 'at risk' or 'problem gamblers' by the CPGI. However, both these groups had higher levels of anti-depressant use - 21.4 per cent compared to 7.5 per cent for those in the general population.

In New Zealand, Scott (2006) found that 45.3 per cent of those with a drug use disorder also meet the criteria for alcohol abuse and 30.7 per cent met the criteria for alcohol

dependence. Slutske, Caspi, Moffin and Poulton (2005) conducted a community longitudinal study of a birth cohort in New Zealand. They found that around two-thirds of problem gamblers in the cohort of 939 at age 21 had a co-occurring substance use disorder.

Furthermore, there is research to suggest that using one substance can exacerbate problems associated with gambling. For example, Shaffer and Korn (2002:191) assert that 'when more than one substance is abused, the prevalence and severity of pathological gambling is increased as compared to individuals who abuse only one drug'.

2.6.3 Co-morbidity in treatment samples

As with the community sample studies, there is a developing body of gambling research utilising treatment samples concerning problem gambling and co-morbidities (Westphal et al., 2008). Ibanez et al. (2001:1733) argue that, as the existence of co-morbidity may influence the severity of the illness, as well as the treatment selection and the outcome, 'it is important to evaluate the frequency and type of co-morbid psychiatric disorders among pathological gamblers seeking treatment'.

Utilising a sample of treatment seeking problem gamblers, Westphal and Johnson (2007) explored the direction of the association between co-morbidity and the development of gambling severity from the participants' perspective. The sample represented between 15 per cent and 26 per cent of people attending Gamblers Anonymous (GA) meetings, or who attended a treatment facility in Louisiana, U.S. Participants were asked if they 'now have or have ever had' any behaviour from a list which included: drinking; drug abuse; and a psychiatric problem such as depression. The majority of the sample - 55.8 per cent - had at least two other disorders (psychiatric and/or substance abuse). The next question asked if any of these problems ever increased participants' gambling problems. Of the 71 participants, 42.3 per cent felt that the co-occurring behaviours made their gambling problem worse (Westphal & Johnson, 2007). These participants had significantly more co-occurring behaviours than those who did not perceive that their gambling problems were negatively affected by their other behaviours.

Other research involving treatment sampling similarly indicates that co-occurring disorders are liable to interact with gambling behaviour as well as affecting gambling treatment (Quilty, Watson, Robinson, Toneatto & Bagby, 2011; Toneatto et al., 2002).

For instance, the results from Westphal and Johnson's study are comparable to those of Toneatto, Skinner and Dragonetti's (2002) study. Toneatto et al. (2002) conducted a study of treatment seeking gamblers in Canada in relation to the prevalence of substance abuse and mental disorders and found high rates of co-morbidities in problem gamblers. Also in Canada (Ontario), Boughton and Falenchuk (2007) conducted a study involving 365 treatment seeking female gamblers to explore the gambling behaviours, personal histories and co-morbid psychological disorders of participants. The study looked specifically at rates of depression and anxiety as well as other behaviours including alcohol and drug use. Rates of psychiatric co-morbidity were found to be higher in the study sample than those found in the general population. Depression was the most frequent complaint, followed by anxiety disorders.

Depression and problem gambling

Prevalence studies concerning problem gambling and co-morbidity have frequently concluded that depression is the most common disorder with problem gambling (Kausch, 2003a; MacCallum et al., 1999; Raylu & Oei, 2002; Specker et al., 1996; Toneatto et al., 2002). For example, Kausch (2003a), in a study involving U.S. military veterans seeking treatment, found that depression was the most common co-occurring disorder amongst problem gamblers. In a study involving fifty problem gamblers receiving treatment in NSW, MacCallum et al. (1999) found a high degree of clinical depression amongst participants and noted that the prevalence of depression amongst participants was the most common disorder. In their earlier study on depression and problem gambling, Specker, Carlson, Edmonson, Johnson and Marcotte (1996), concluded that people seeking treatment for gambling problems had higher rates of depression than non-gamblers. Toneatto, Skinner and Dragonetti (2002) studied 169 problem gamblers in Canada seeking treatment. They were concerned with the use of psychiatric medications (e.g. antidepressants) as well as alcohol and drug use. Toneatto et al. (2002) reported that 26 per cent were found to be using psychiatric medication, primarily antidepressants. Raylu and Oei (2002) asserted that rates of depression in people with gambling problems have been found to be as high as 75 per cent. Battersby et al. (2006), identified depression, along with substance abuse, as the two most common co-morbid disorders associated with problem gambling for those seeking treatment.

In relation to temporal sequencing between depression and co-morbidities, Battersby et al. (2006) noted that few studies have looked at the time sequence of depression and

gambling. However, in an earlier U.S. study on problem gambling and depression, McCormick, Russo, Ramirez and Taber (1984) established that gambling preceded depression in 86 per cent of pathological gamblers.

Depression, suicide and problem gambling

High rates of suicidal ideation in problem gamblers have been shown in the gambling literature using treatment samples. For example, Boughton and Falenchuk (2007), in their Canadian study on 365 female gamblers, found that 45 per cent of the sample reported suicidal ideation and 29 per cent had made suicide attempts. In another U.S. study, Petry and Kiluk (2002) found that, of 342 problem gamblers seeking treatment, 17 per cent had attempted suicide. Factors distinguishing suicidal and non-suicidal behaviour included more psychiatric symptoms and gambling severity.

In Australia, Battersby, Tolchard, Scurrah and Thomas (2006) conducted a study aimed at describing the 12-month period prevalence and risk factors for suicide ideation and behaviour in 43 problem gamblers attending treatment clinics. The study found that 81.4 per cent of participants showed some suicide ideation and 30.2 per cent reported one or more suicide attempts in the previous 12 month period. In another Australian study, involving 50 treatment seeking problem gamblers, Maccallum et al. (1999) found that 38 per cent had suicidal ideation. Also in Australia, Hoogland and Pieterse (2000) conducted a survey of 82 people presenting at LifeLine Addictions Counselling Service in Sydney, in relation to a gambling problem. In total, 48 clients (59 per cent) had experienced some measure of suicidal thought. The survey found the following results:

- No thoughts of suicide (N=34)
- Suicidal thought but no clear plan (N=30)
- Suicidal thoughts with a clear plan (N=12)
- One or more previous suicidal attempts (N=6)

(Hoogland & Pieterse 2000).

These studies indicate that people attending treatment for problem gambling have significantly high rates of suicidal ideation. Indeed, Battersby et al. (2006:233) stated that 'pathological gambling should be seen as a chronic condition with a similar risk for suicidal ideation and behaviour as other mental illnesses'.

Anxiety disorders and problem gambling

As with the community samples that have looked at anxiety disorders and gambling, there is evidence in the literature to suggest higher levels of anxiety disorders among problem gamblers receiving treatment compared to the general population; indeed, researchers have found that anxiety is often a key hallmark of gamblers who seek treatment (Ibanez et al., 2001; Oaks, 2002; Shaffer & Korn, 2002; Quilty et al., 2011). For example, Oaks (2002), at the Flinders University Anxiety Disorders Program in South Australia, reported that 71 per cent of problem gamblers referred to the program had some form of anxiety disorder. In a Spanish study by Ibanez, Blanco, Donahue, Lesieur, Perez de Castro, Fernandez-Piqueras and Saiz-Ruiz (2001), involving problem gamblers seeking treatment, anxiety was significantly higher amongst those with more severe gambling problems. Quilty et al. (2010) highlight that clinical studies support a particularly high association between various anxiety disorders and problem gambling. Shaffer and Korn (2002:193) point out that 'clinicians have described the signs and symptoms of anxiety as common prior to becoming a gambler, whereas gambling as escape from these unpleasant emotions meets a DSM-IV diagnostic criterion for pathological gambling'.

Alcohol use disorders and problem gambling

Again, similar to the community samples, a significant number of problem gamblers receiving treatment were found to also have problems with alcohol. For example, MacCallum and Blaszczynski's (2002) study comprising 75 problem gamblers in NSW who were receiving treatment, found that around 17 per cent were also considered to be alcohol dependent. Similarly, Grant, Kushner and Won Kim (2002:143) state that 'problem gambling is more common among people with alcohol use disorders compared with those without alcohol use disorders'. This association is even more pronounced among problem gamblers receiving treatment. In Spain, Ibanez et al. (2001) examined the impact of co-morbidities on problem gambling on 69 gamblers seeking treatment. They found the most often co-occurring disorder was alcohol abuse.

In relation to severity of problem gambling, Stinchfield, Kushner and Winters (2005) conducted a study in Minnesota, U.S. of 765 problem gamblers attending treatment programs. They found that gamblers who had both a history of frequent alcohol use and substance abuse also had more severe gambling problems. Grant et al. (2002) identify the need for further research into the association between the event level - the effects of drinking on gambling behaviour and severity and vice versa - and the

syndrome level - the relative onset and course of each condition for those with either one or both morbidities. The results can therefore aid in the treatment of these conditions (Grant et al., 2000).

Nicotine dependence and problem gambling

There is a growing body of evidence from treatment studies that have found an increased rate of smoking in problem gamblers compared to the general population. However, as noted in the community sample studies, most of this evidence concerns smoking in general rather than nicotine dependence specifically. For example, in a New Zealand study of 80 gamblers at a day-treatment centre, higher rates of smoking were found. In this study, two-thirds of the participants were smokers (Sullivan & Beer 2002). In addition, Sullivan and Beer (2002) found that most of the gamblers who smoke reported increased levels of smoking while gambling. However, MacCallum and Blaszczyński (2002), in their study conducted in Australia, looked specifically at nicotine dependence and problem gambling, rather than smoking generally. They found that 37 per cent of problem gamblers receiving help at a NSW treatment centre were dependent on nicotine.

Rodda, Brown and Phillips (2004) point out that the high smoking rates amongst problem gamblers indicate that problem gamblers may signify a population that is resistant to anti-smoking interventions. They propose that such focused smoking prevention and cessation strategies could be aimed at venues and directed through public education programmes that already target problem gamblers. However, they note that the links between gambling and smoking remains poorly understood. Rodda et al. (2004:73) suggest that, as some studies advocate that smoking helps to improve negative mood, 'the presence of negative affect in the experience of smokers and problem gamblers may indicate a common causal sequence for both smoking and gambling'. It remains unknown whether there is a linear relationship between smoking and problem gambling.

Other substance dependence and problem gambling

Evidence from studies that have utilised treatment samples has predominantly found higher rates of drug use and dependence amongst problem gamblers. In their study of co-morbidity and problem gambling in three U.S. addiction treatment facilities involving 220 males and 108 females, Rucich, Frisch and Govoni (1997) found high rates of co-morbidity between substance-related disorders and pathological gambling. Similarly,

Kausch (2003b) reported on the substance abuse of 113 of U.S. veteran gamblers in a treatment facility. Kausch found that the majority of participants - 66.4 per cent - had a diagnosis of life-time substance abuse. In another U.S. study, Kandel, Huang and Davies (2001) sought to establish the relationship between substance use and mental disorders. They found a strong relationship between mental disorders and drug dependence. Furthermore, if there were multiple drug dependencies, this increased the strength of the relationship. Other studies concerning problem gambling and substance use conducted using treatment samples have yielded similar results (Battersby & Tolchard, 1996; Westphal & Johnson, 2003). Westphal and Johnson (2003) assert that approximately 50 per cent of pathological gamblers have a substance use or dependency diagnosis.

In an Australian study of problem gamblers attending the South Australian Flinders Medical Centre, it was found that around 15 per cent had some form of substance dependence (Battersby & Tolchard 1996). Using a life-time prevalence analysis, a New Zealand study by Sullivan and Penfold (1999), found that around 47 per cent of problem gamblers who received treatment at the Compulsive Gambling Society Treatment Centre, reported addiction (at some time) to a psychoactive substance - i.e. a drug that can produce mood changes and can be used either recreationally or therapeutically as medication.

Personality disorders

Research indicates that problem gamblers have elevated rates of various personality disorders compared to the general population (Bland et al., 1993; Blaszczynski et al., 1986; Cunningham-Williams et al., 1998; Slutze et al., 2007). Black and Moyer (1998) reported that eighty-seven per cent of problem gamblers had at least one personality disorder, with the most common being obsessive-compulsive disorder and anti-social personality disorder. A similar rate of problem gamblers with a personality disorder (93 per cent) was found by Blaszczynski and Steel (1998). Blaszczynski and Steel (1998) conducted a study involving 82 problem gamblers in treatment for problem gambling concerning personality disorders. They found that 93 per cent of participants met diagnostic criteria for at least one personality disorder. The most common personality disorders were: borderline personality disorder; anti-social personality disorder; and narcissistic personality disorder.

However, Raylu and Oei (2002) argue there are methodological weaknesses contained in personality studies concerning problem gambling, such as sample size and

distinguishing between various forms of gambling, as well as other factors including the amount of time spent gambling. In addition, Raylu and Oei (2002) note that the existing research concerning problem gambling and personality disorders has mainly looked at white males thus making it difficult to generalise results to women problem gamblers or to problem gamblers from other cultural groups and noted that further research is required concerning problem gambling and personality disorders.

In relation to the temporal sequencing between personality disorders, and in particular borderline personality disorder and problem gambling, Bagby et al. (2008:204) state that:

“What remains unclear is the causal temporal relationship between borderline personality disorder and pathological gambling. However, the presumption would be that this personality disturbance, or at least some of the features associated with it, preceded the onset of pathological gambling”.

2.6.4 Confounding variables

Demographic, social and environmental factors such as age, gender, education and culture and ethnicity often impact on health status and so should be considered in an investigation of risk. Several of these are discussed below in the context of their known and unknown impacts on problem gambling.

Demographic profile of problem gamblers

Various studies have investigated problem gambling and its relationship to several key factors and found that certain demographic variables such as gender, age, ethnicity, specific cultural groups and psychological disorders (e.g. anxiety disorders, depression, substance use) can predict the risk of problem gambling (Clarke et al., 2007; Delfabbro, 2008; Hayatbakhsh et al., 2006; Westphal & Johnson, 2003). In the gambling literature, analysis suggests that ‘gambling is not a uniform phenomenon across different demographic groups’ (Delfabbro 2008:19). Westphal and Johnson (2007) identified demographic risk factors for problem gambling resulting from prevalence studies, including age, gender and the presence of mental health disorders. Thomas and Jackson (2008) point out that it is important to understand the interactions between risk and protective factors for problem gambling for specific groups so that these groups can be targeted with appropriate interventions. Clarke et al. (2007) state that ‘recognising the need for help with gambling problems and making the decision to

seek treatment are influenced by demographic factors such as age, gender and ethnicity...’.

Shaffer and Korn (2002) identify the need for further research directed toward specific population groups. For instance, while gender differences in gambling treatment have been noted, there is insufficient knowledge about effective strategies within subpopulations, including women (Crisp et al., 2000; Holdsworth, Nuske & Breen, 2012; Westphal & Johnson, 2007). Crisp et al. (2000) claim that treatment continues to be ‘typically based on male models’ and thus is in need of modification for use with female gamblers. The US National Center for Responsible Gaming (NCRG) and the Institute for Research on Gambling Disorders (2009) have made research on specific groups a priority, especially supporting investigations of gambling problems among young people, women and certain cultural groups.

Gender

Westphal and Johnson (2003) have noted that, due to the historical predominance of males in populations with problem gambling, the effect of gender on co-morbidity has been insufficiently studied. Yet, as Boughton and Falenchuk (2007) have noted, gambling is fast becoming a mainstream activity for women. Delfabbro (2008) claims that recent surveys indicate that women currently gamble as often as men do. However, there are differences in gambling preferences and motivation. Hing and Breen (2001) looked at preferred gambling activities in relation to gender as well as the prevalence of problem gambling. While it was found in Hing and Breen’s (2001) study that women gamble at rates comparable to men, women have a tendency to be involved in different gambling activities. In addition, studies suggest that women may have different motivations to gamble. Recently, there have been several studies that have presented evidence for differences in gender-based motivation. For instance, Gordon (2008) identifies women as being more likely than men to gamble to escape depressed moods. A study by the Victorian Department of Human Services (2000) suggested that women may be motivated to gamble to alleviate stress or anxiety while men may be motivated more by extrinsic factors. Likewise, Pierce et al. (1997) found that women gamblers were more likely than men to gamble as a way to deal with anxiety. Boughton and Falenchuk (2007) found that female gamblers may be motivated to gamble as an escape from personal pressures, anxiety and depression.

In their study of gender differences in pathological gambling, Blanco, Hasin, Petry, Stinson, and Grant (2006) found that women were significantly more likely than men to

have lifetime mood and anxiety disorders. Getty, Watson and Frisch (2000) claim that female problem gamblers have higher rates of anxiety and depression than that of the general population, as well as male gamblers. Petry et al.'s (2005) findings also revealed stronger associations with major depressive episodes and anxiety among women than men. In their research on problem gambling, using regression analysis, Thomas and Moore (2001) found that women who scored higher on measures of anxiety and depression also scored significantly higher on their measure of problem gambling, whereas no similar relationship was found for men. Males, however, tend to have higher rates of substance abuse (with the exception of prescription medication).

Westphal and Johnson (2003) explored gender differences in psychiatric co-morbidity and treatment-seeking among gamblers. Their sample included 40 males and 38 females (N=78) in treatment programmes. The majority of the participants (53 per cent) reported having co-morbid problems. Females were found to have more co-morbid problems than males - 23 per cent for females as opposed to 20.6 per cent for males. As with Thomas and Moore's (2001) findings, males reported more alcohol and drug use problems, females reported more tranquiliser use and outpatient treatment. In addition, Specker et al. (1996) highlighted anxiety disorders, particularly social phobia, as a key disorder affecting female problem gamblers. However, Gordon (2008) also noted that women who are problem gamblers are significantly more likely to seek treatment for their mood or anxiety disorder than are men.

Clearly, there is evidence in the literature to suggest that female problem gamblers are different from male problem gamblers in relation to various factors including gambling behaviours and mental health issues. However, as noted by Boughton and Falenchuk (2007:325), 'current treatment strategies, often developed for work with male populations, may not be optimally effective in addressing women's treatment needs and issues'. They asserted that it is important to make information and treatment relevant to women's needs available that will serve as an early intervention strategy.

Culture and ethnicity

Blaszczynski et al. (1997) have noted there is substantial anecdotal evidence that indicates disproportionately high rates of gambling, along with problem gambling, in particular ethnic and cultural groups in Australia. For instance, Delfabbro (2008) claims that people from a Vietnamese background may be particularly drawn to Western-style gambling venues. In New Zealand, Abbott and Volberg (2000), in a national prevalence

study, have noted the high rate of gambling in Maori as well as Pacific Islander populations.

McMillen, Marshall, Murphy, Lorenzen and Waugh (2004) point out that culturally specific attitudes, values and beliefs can determine the importance of gambling within individuals including factors such as the incorporation of gambling activities into cultural festivities. An example of this is the Chinese New Year celebrations. In addition, McMillen et al. (2004) note that in some communities, gambling based activities are promoted to advance social cohesion and social ties, as well as to redistribute finances within a community. However, in other communities and cultural groups the opposite can be the case, with gambling highly stigmatised (Clarke et al., 2007).

In New Zealand, Clarke, Abbott, DeSouza and Bellringer (2007) have noted that cultural beliefs and values impact, not only on people's gambling behaviours and activities, but also on their help-seeking attitudes and use of treatment and other health and welfare services. In relation to help seeking, Clarke et al. (2007) point out that around one third of people utilising gambling treatment or helpline services are Maori, mainly women. In addition, 'social stigma attached to gambling among ethno-cultural populations within their own communities may prevent problem gamblers from seeking professional help' (Clarke et al., 2007:297). Furthermore, they point out that, in some communities and cultures, there may be an unwillingness to seek help for problem gambling due to concern that the whole community might be stigmatised.

Age

Age (like gender and ethnicity) is a key factor for gambling related problems (Delfabbro 2008). For instance, research suggests that the prevalence of gambling-related problems tends to be significantly higher in younger adults (aged 18-30 years) than in all other age cohorts (Delfabbro & Winefield, 1996; Dickerson et al., 1996; Productivity Commission, 1999; South Australian Department of Human Services, 2001). Indeed, it has been found that adolescents report experiencing gambling-related problems at 2 to 3 times the rate of adults. For example, Jacobs (1999) pointed out that, while the adult prevalence rates were typically around 1 per cent and 2 per cent of the general population, the mean rates for adolescents found in Canada was 6 per cent, and 4 per cent in the U.S. The rate of adolescent gambling has also been found to be high in other countries. In New Zealand, a study was conducted by Sullivan (2001) involving 547 teenagers who were randomly selected from schools in the Auckland area. Sullivan (2001) reported very high levels of problem gambling; the proportion of

teenagers scoring in the problematic range of validated problem-gambling measures was considerably higher than in the adult population.

In Australia, studies have found that when young people commence gambling during early adulthood they are more likely to develop problems with gambling than those who do not. For example, the Productivity Commission (1999) found that 35 per cent of male problem gamblers seeking treatment reported starting gambling regularly between the ages of 11 and 17 years and that 9 per cent reported they had a problem at that age. In a study by Bondolfi et al. (2000) age of onset (before the age of 21) was shown to be a significant risk factor for problem gambling. Similarly, Volberg et al. (2001) found that age of onset of gambling impacted on problems with gambling. It was found that risk factors for gambling problems was 19.9 years for non-gambling problems and 15.6 years for problem gambling. The New Zealand National Survey (1999) found that there was a high risk for problem gambling if gambling first commenced before the age of 13 years or at 25 years or later.

At the other end of the age spectrum, Delfabbro and LeCouteur (2003) have noted that there is relatively little research that has focused specifically on the older age cohort. One study conducted for the Victorian Casino and Gaming Authority (1997, cited in Delfabbro & LeCouteur, 2003), involving people aged 55 years and over, found that older people have different gambling preferences to the general population. Older people tend to gamble on bingo-style games and have a lower rate of involvement in most other activities, except gaming machines. Delfabbro and LeCouteur (2003) note that the main outcome of studies that have explored age in relation to differences in gambling is that the widespread public perception that gambling is endemic amongst older people is inaccurate; people aged 55 and over are likely to be more visible in their gambling behaviour because they gamble mainly during the day. 'Older people, in fact, gamble less frequently, and spend less than other population groups, even on poker machines' (Delfabbro & LeCouteur, 2003:21). However, Delfabbro and LeCouteur (2003) further point out that, because older people generally have lower incomes, they are potentially more at risk if they spend excessively.

Sullivan Kerber, Black and Buckwalter (2008) conducted a study on co-morbid psychiatric disorders among older adults recovering pathological gamblers. The study involved 40 older (55 years or more) pathological gamblers recruited from gambling treatment centres and through GA meetings (25 men and 15 women participated). In total, 82.5 per cent of participants were found to have a mood disorder as well as

having experienced major depression. Alcohol was problematic for 32.5 per cent with 47.5 per cent suffering from an anxiety disorder. Similarly in their study, Pietrzak, Morasco, Blanco, Grant and Petry (2007) found that older problem gamblers experienced higher rates of alcohol abuse, depression, dysthymia, generalised anxiety disorder, social phobia and obsessive-compulsive disorder than that of the general population.

Burge, Pietrzak, Molina and Petry (2004) looked at age of gambling initiation and severity of gambling and health problems among older problem gamblers. They examined the relationship between age at first gambling experience and problem severity. Fifty-two problem gamblers over the age of 65 were involved in the study. The study found that those with early onset gambling had more severe psychiatric problems compared to those with late onset gambling. In addition, Burge et al. (2004) noted that results suggested that gambling that begins in adolescence may be associated with an elevated severity of problems through the life span. This result supports other studies concerning age-of-onset being a determinant of gambling problems (Hayatbakhsh et al., 2006; Kessler et al., 2008).

2.6.5 Temporal sequencing

Most studies discussed in this review have provided evidence for the prevalence of co-morbidities with problem gambling, but not evidence for temporal sequencing. For example, Petry et al.'s (2005) study, while identifying clear associations between pathological gambling and co-morbidities, did not address the temporal sequencing of problem gambling and co-morbidities. Gordon (2008) asserted that the causative relationship between co-morbid problem gambling and other mental disorders has not been established and whilst true, there has been a number of Australian and overseas studies building toward this by reporting the temporal sequence between disorders.

Black and Moyer (1998:35) found that problems with co-morbid depression and phobias 'usually preceded gambling among problem gamblers with co-morbid depression and phobias'. More recently, Kessler et al.'s (2008:1358) retrospective age of onset analyses related to pathological gambling and co-morbidity, suggested that 'other disorders typically predate the onset of pathological gambling and predict the subsequent onset and persistence of pathological gambling'. They noted that these associations are particularly significant for mood and anxiety disorders. Hayatbakhsh et al. (2006) noted the significance of age of onset for substance use and gambling and found that early age of onset substance use had a positive association with problem

gambling. In an earlier study, McCormick et al. (1984) distinguished between primary and secondary disorders and found that 86 per cent of cases of pathological gambling preceded depression. Age of onset information was analysed for those meeting criteria for psychiatric or substance use disorders to determine the chronology of pathological gambling - whether pathological gambling disorder came before, occurred at the same time as, or came after the onset of other psychiatric disorders, including substance dependence. Pathological gambling was found to be mainly a secondary disorder to other psychiatric and substance dependence disorders in this sample. In addition, among substance users, 73 per cent of pathological gambling cases came after any substance dependence (3.5 years later on average) and 63 per cent of pathological gambling cases came after any alcohol or illicit drug dependence (2.3 years later on average) (McCormick et al., 2000). Lorains et al. (2011) suggested that mood and anxiety disorders may often precede gambling problems. They draw on Blaszczynski and Nower's (2002) Pathways Model to propose that a sub-group of people who gamble problematically do so to assist symptoms of depression and anxiety.

According to Potenza (2007), the limited evidence concerning the temporal relationship between co-morbidities suggests higher risks of problem gambling among people with pre-existing mental health conditions and dependencies, such as depression and alcohol dependence. Delfabbro and Winefield (1996), in their South Australian study, found that 16 per cent of gamblers who played poker machines regularly reported that they experienced depression as a result of gambling.

In addition, some studies have examined the severity of both gambling and the co-morbidity. For example, the Productivity Commission (2010) noted, in relation to depression and anxiety, that although some people may be depressed before their problems with gambling develop, gambling can exacerbate pre-existing conditions, while Ibanez et al. (2001) claim that co-morbid disorders can increase the severity of problem gambling.

However, other studies, while acknowledging an association between problem gambling and co-morbidities, have reported inconclusive results as to the temporal sequencing. For instance, in Thomas and Jackson's (2008:ix) study predominantly concerning depression, they reported that it was not possible to establish a causal nexus between problem gambling and other co-morbidities, stating that 'it is unknown whether one set of conditions precedes the other'. Similarly, Kim et al. (2006) concluded inconsistent findings in their study concerning problem gambling and

depression. Battersby et al. (2006:234) noted, in relation to depression, suicide ideation and problem gambling, that problem gambling is connected to co-morbid mental illness, both as a cause and effect and would be likely to increase the risk of suicide 'whatever the direction of causality'.

In their study, Hodgins, Peden and Cassidy (2005) looked at mood disorders in problem gamblers. They aimed to assess which disorder came first - problem gambling or the mood disorder. They found varied and inconclusive results; the mood disorder was just as likely to start before or after the problem gambling. Similarly, in relation to smoking and problem gambling, Rodda et al. (2004) noted that there is a relationship between problem gambling and smoking; however the links between the two remains inadequately understood. For example, it is not known whether there is a linear association between the two or as the expense associated with each increases, this causes the reduction in one or the other.

In addition, as noted in the Australian National Co-morbidity Project (2001), establishing temporal relationships can be further complicated by the evolving nature of the co-morbidities within the individual. For instance, co-morbid mental illnesses and addictions are often mutually influenced and change over time and so cannot be categorised precisely into primary and secondary causes. In a submission to the Productivity Commission Gambling (2008) by the Gambling Treatment Program, St Vincent's Hospital, Darlinghurst, NSW it was highlighted that factors that initiate problem gambling may not be the same factors that maintain it. It is noted that problem gamblers with an anxiety disorder or depression, for example, may be caught in a cycle in which the gambling relieves mental problems in the short term while intensifying them in the long term.

Shaffer and Korn (2002) assert that the complex relationships between co-morbid disorders include the possibilities that one disorder protects against the other, that one disorder causes the other, that both disorders share the same cause or are components of a more complex set of symptoms, or that both disorders are independent of each other. They, like other researchers (for example, Brooker et al., 2009; Hayatbakhsh et al., 2006; Westphal & Johnson, 2007), point out that more research is needed in this area of relationships between problem gambling and co-morbid disorders, including the need for prospective research.

2.7 Summary of evidence on problem gambling co-morbidities

The rates of alcohol dependence, smoking and other drug use have been found to be significantly higher in problem gamblers than in the general population. In addition, there is strong evidence to suggest that problem gamblers have increased rates of mental disorders, including depression, suicide ideation and anxiety disorders. While it remains unclear as to the presence of causality between gambling and DSM-IV recognised mental disorders, what is clear is that there does appear to be a relationship between problem gambling and co-morbidities. However, associations between gambling and co-morbidities are poorly understood and this is in some part due to the reliance on cross-sectional and retrospective studies that may at best allow for information on temporal sequencing but do not allow any inference of causation. Studying the patterns of co-morbid disorders will lead to a better understanding of these relationships by understanding which disorder is primary and the presence of any causal relationship. However, what is needed to properly test a construct as complex as co-morbidities are prospective studies with large samples extended over a number of years.

In summary, the issue of ascertaining the temporal relationship between problem gambling and co-occurring disorders is an important one. By understanding the connection between problem gambling and co-morbidities in the general population, as well as within subgroups and treatment samples, better treatment and harm minimisation strategies, as well as useful and appropriate policies, can be developed.

Chapter 3 Counsellors and Mental Health Therapists

3.1 Introduction

This Chapter presents and discusses the findings of a series of exploratory forums, focus groups and interviews held with problem gambling counsellors and mental health therapists. The first section presents and discusses the findings from a large focus group held with problem gambling counsellors convened as part of the *Gambling and Co-morbid Disorders Workshop* - at the National Association for Gambling Studies (NAGS) Conference on 19th November 2009. It was decided to conduct the focus group as part of NAGS as many counsellors attend this conference. The focus group included a diverse national sample of problem gambling counsellors from all areas of Australia.

3.2 Forum

Through the literature review several co-morbidities were identified and presented to the forum (for example, Cunningham-Williams et al. 2000; Kessler et al. 2008; Petry et al. 2005; Thomas & Jackson 2008). The list of disorders included:

- Depression
- Post Traumatic Stress Disorder (PTSD)
- Social phobia
- Alcohol dependence
- Drug dependence
- Agoraphobia
- Panic disorder
- Bipolar disorder
- General Anxiety Disorder (GAD)
- Phobia
- Nicotine dependence

A key aim of this stage was to explore the views of problem gambling therapists thus providing information to guide the subsequent stages of the research. A particular purpose of the forum with problem gambling counsellors was to ascertain the most

prevalent co-morbid disorders with problem gambling before discussing these with therapists specialising in specific mental disorders. The issue of the temporal sequencing of disorders was also discussed. This information was particularly important to assist the construction of a quantitative questionnaire in the later stages of the study. Participants who took part in the forum self-identified as having experience in co-morbid issues with problem gambling.

Thirty-three people participated in the forum (N=33). While the majority of those participating in the forum were counsellors or psychologists (N=25) not all participants were. Others present were from government departments concerned with public health and policy, project officers, researchers and educators. The breakdown of the forum participants by position is shown in Table 3-1.

Table 3-1 - Breakdown of forum participants

Sector/Expertise	Number
Problem gambling counsellors/psychologists	25
Project Officers	2
Training/education/research	2
Public Health	1
Policy	2
Carer/s	1
Total	33

3.2.1 Forum method

A focus group method was selected for its usefulness in research exploring the views of counsellors with experience in the treatment of problem gambling and to provide guidance in the later stages of the project. This approach is often utilised in research because it provides insight into specific areas and is an effective method of gaining a deep understanding of a situation relatively quickly (Neuman 2000).

A brief overview of the literature and the research project was provided to participants outlining the key research areas, aims and questions being addressed in this study. The focus group discussions allowed the participants opportunities to contribute their unique and relevant experiences. Answers were digitally recorded and notes taken to ensure accuracy (Puchta & Potter 2004). The focus group ran for around 90 minutes.

Data analysis

The forum data was coded prior to thematic data analysis. Bryman and Burgess (1994) note that coding is an important part of the data analysis process because it provides a necessary link between the data and the theory where themes begin to interrelate and connect within sub-categories. Attride-Sterling (2001) notes that this process in the data analysis stage is known as 'thematic networking' as the themes and categories begin to establish more meaningful relationships through the initial coding.

Examination of the codes and the researchers' understanding of the literature enabled the researchers to begin to generate themes about the emerging patterns.

An important part of this process requires the researchers to compare and analyse the emerging themes. Ultimately, an overall picture of the themes identified by participants in the research is able to be made (Krueger 1994). For example, by the end of the focus group, a clear list of the most prevalent co-morbid disorders with problem gamblers was able to be determined.

To maximise the reliability of the thematic data coding of the focus group, data was independently checked by a researcher who had not been present at the Stage One focus group. Coding of the focus group data was also conducted by the same researcher. Verification with one of the researchers who had taken part in the focus group was undertaken to check the reliability of the coding (Breen 2006). This verification process involved careful review and discussion to enable rigorous and acute analysis.

All participants who accepted to take part in the focus group were given background information about the study. Participants were offered a \$20 petrol voucher for taking part in the study. The consent process included: the provision of an Information Sheet to participants which described the focus group process, the aims and importance of the study, confidentiality concerns and the voluntary nature of participating in the study. A consent form was signed to complete the process.

Limitations

A limitation of the forum concerned the sampling used for accessing the participants. As the forum was convened as part of the *Gambling and Co-morbid Disorders Workshop* - at the National Association for Gambling Studies (NAGS) Conference, it was difficult to utilise purposeful sampling. However, by-and-large, the majority of therapists attending the focus group clearly had experience in treating people with problem gambling and co-morbidity. In addition, there was a good national representation of participants in the focus group.

Another limitation was the size of the focus group. While initially it was specified that between 15 and 20 problem gambling counsellors would participate in the focus group, there was a total of 33 participants. This, however, was not considered to detract from the quality of data gathered at the focus group as not all participants actively participated. In actuality, there were about 20 participants who actively related their views and experiences about problem gambling and co-morbid disorders and other relevant issues.

In comparison to quantitative research, the sample size of this stage of the study is small. However, qualitative research generally does not include large numbers of participants and large numbers are in fact not considered beneficial. This point is highlighted by Merriam (1998, p. 208) who states: 'in qualitative research, a small sample is selected precisely *because* (emphasis in original) the researcher/s wishes to understand the particular in depth'. Therefore, each participant's views and experiences have value and add to the understanding of the issues being researched.

3.2.2 Forum responses

The list of co-morbid disorders identified by participants was discussed in the context of how prevalent each disorder is, its temporal relationship with and the predictive capacity for problem gambling, and its co-occurrence with other co-morbidities. It was noted in that people with co-morbid conditions are less likely to benefit from treatment, as well as being more likely to lead to relapse. One participant said:

Those with drug and alcohol dependence are more likely to be co-morbid and people have more difficulty taking on the treatment. Also people are less likely to recover on their own without treatment and they present more.

In the focus group the question was asked: From the list, in your experience what would be the most prevalent disorders associated with problem gambling? From the list the five most prevalent co-morbid disorders with problem gambling were identified. The list was based on the relevant literature of mental illnesses that are prevalent in the general population:

- Depression
- Post Traumatic Stress Disorder (PTSD)
- Social phobia
- Alcohol dependence
- Drug dependence
- Agoraphobia
- Panic disorder
- Bipolar disorder
- General Anxiety Disorder (GAD)
- Phobia
- Nicotine dependence

The following mental disorders were discussed with some differences noted amongst participants. However, all agreed that depression was a key prevalent co-morbid condition with problem gambling.

Depression

It was noted that, as the rate of depression is high in the general population, it would be expected to be high amongst problem gamblers as well. It was agreed amongst the focus group participants that depression was a prevalent disorder. It was also noted that there is a difference between depression and major depression.

Some people discussed the link between anxiety disorders and depressive disorders, suggesting that 'depression and anxiety go hand-in-hand, they are associated' and that 'you never really get depression without anxiety, and you never really get anxiety without depression.'

Another issue raised was about the diagnoses and assessment of depressive disorders as well as other disorders and the various tools used, with one participant noting that 'very few GPs use DSM criteria to diagnose depression - and they should. In my view there is an over diagnosis of depression'. There was also discussion about the screening processes for depression as well as screening for specific mental illnesses.

Anxiety

Anxiety disorders were also raised in the forum. The importance of looking at primary anxiety that is not linked to depression was noted. Specific anxiety disorders were also discussed such as social phobia and general anxiety disorder (GAD).

In addition, Post Traumatic Stress Disorder (PTSD) was raised by several members of the group in relation to anxiety and trauma. It was noted by some of the participants that it is unclear whether trauma (e.g. traumatic childhood events, sexual abuse and domestic violence) was an issue on its own or whether it would manifest into a later problem such as 'anxiety due to post traumatic stress.' One participant said:

When we have asked people "why do you think you're a problem gambler - what caused your gambling?" people said it was because of emotional abuse - they had not been listened to.

Others linked problem gambling to trauma and this led to further discussion about the issue of trauma. For instance one participant asserted that 'problem gambling and mental illness are very common to trauma.'

One participant expressed that 'grief is unresolved trauma' and by another that 'trauma can lead to depression and PTSD'. Another also noted that 'a lot of people with anxiety and depression feel that they are traumatised, they claim they have PTSD 'cause it's a better diagnosis.'

One person discussed results in relation to the U.S. National Co-morbidity Survey Replication (Kessler et al. 2008) study, highlighting the findings that 'diagnosis of PTSD increased after 9/11 because a lot of people were so traumatised ... a lot more people were seen by mental health professionals.'

Drug and alcohol dependence were also identified as prevalent disorders associated with problem gambling. Some thought that drugs and alcohol should be treated as separate conditions while others thought they should be collapsed within the issue of 'substance abuse' or 'substance disorders'. For instance, one person argued that

substances should be addressed separately as access to substances differs. She asserted that 'when you go to a venue they don't sell you cocaine or heroin, they sell you alcohol.' Conversely, another thought 'it should be substance abuse in general, it covers the lot.'

Ultimately, however, it was generally thought that the three - alcohol, drug and nicotine dependence/abuse/disorders - should be considered separately. One person emphasised that 'alcohol and nicotine are also drugs so these should be discussed as alcohol and other drugs while others similarly raised the concern of nicotine dependence.' For example, one participant noted that 'more than half the people I see have nicotine dependence, they're nearly all smoking.'

There was also discussion about the difference between 'dependence' and 'abuse'. It was highlighted by some participants that abuse and dependence are two separate issues, because 'some people aren't dependent'.

Other disorders

Other co-morbid disorders that occur with problem gambling were then asked about and discussed. Disorders that were identified were: personality disorders; suicidality; and schizophrenia.

Personality disorders:

The issue was raised about personality disorders. It was noted that personality disorders and problem gambling together have been largely ignored in the literature. Some participants noted that this was the case even though personality disorders are prevalent with problem gambling. Discussion about personality disorders included mainly impulsivity, borderline personality disorder and anti-social personality disorder.

Suicidality:

Several participants raised the issues of suicidality. However, it was felt that suicidality should not be included in the list of the most prevalent co-morbid disorders. Rather, suicidality was discussed predominantly in relation to depression and the temporal sequencing of problem gambling and mental illness.

Schizophrenia:

Several participants also discussed schizophrenia. While it was noted that schizophrenia is 'very rare', 'some of the less prevalent disorders, such as schizophrenia, can take up an enormous amount of time in treatment.' It was thus decided schizophrenia should not be in the final list of prevalent co-morbid disorders.

The final list

The final list consisted of:

- Depressive disorders (major depression);
- Anxiety disorders (social phobia, agoraphobia, panic disorder, GAD);
- Alcohol abuse/dependence (it was noted that the terms need further clarification);
- Drug abuse/dependence;
- Nicotine dependence; and
- Personality disorder.

Individual differences

The question was asked about confounding variables in relation to age and gender and co-morbidities. In relation to gender, comments were mixed. These included that 'PTSD and anxiety disorders come up a lot, particularly for women' while a contrary opinion suggested that 'males show really high anxiety and males also show high suicidality.'

In relation to age, it was noted that environmental factors come into play. For example, one participant pointed out that:

With drug and alcohol and nicotine - it could be to do with age because young people go out more and they gamble for stimulation. Older people tend not to do that so much.

Temporal sequencing

After the identification of the most prevalent disorders, the question was asked - What is the temporal sequence of disorders with problem gambling - before, the same time or after (or a combination of these)?

Discussion was mixed and inconclusive. In relation to mental illness and co-morbidity generally, one participant said 'depression is actually secondary to alcohol and then stopping the alcohol improves the depression, while another asserted: '... that nicotine is first [before the mental illness], that alcohol is first and that drugs are first, but there are variations. But with the gambling, it seems to be 50/50.'

'In my clinical experience', said another, '70 per cent of people have mental health issues before problem gambling' although others said that it depended 'on the condition' and 'depends on peoples' experiences'. One participant thought that 'anxiety is more likely to have come first before the problem gambling', with 'a major trauma ... start[ing] problem gambling.'

In relation to suicidality, one participant claimed:

There is a 50/50 split regarding suicidality prior to problem gambling ... half are suicidal long before they got involved in problem gambling, but they were not necessarily diagnosed with a mental illness.

One participant spoke about the interconnectedness of PTSD and problem gambling thus:

A lot of problem gamblers that I've seen have been borrowing money illegally at interest rates of 42 per cent. So they're hanging around with people who are quite dangerous - and then they get beaten up and that's why I think they get PTSD because they get beaten up.

This participant therefore suggests that problem gambling comes before the PTSD and that the environment connected to gambling is an important concern as 'whatever the problem [mental illness], it always makes gambling worse.'

However, the majority believed that the temporal sequencing of disorders is difficult and that 'it depends' and that 'each individual case is different'. For instance, one participant said 'all mental illnesses can occur either before, during or after. '

Other disorders and issues

Some additional issues that were raised in the focus group included:

- Childhood Attention Deficit Hyperactivity Disorder (ADHD). One participant noted that - 'ADHD contributes to problem gambling'.
- Self-esteem issues (arising from family - childhood) - For instance, one participant claimed that: 'self-esteem impacts on co-morbidity'.

- Trauma linked to Post Traumatic Stress Disorder (PTSD) was raised as an important issue for some of the participants.

Indeed, for several of the participants this was an important issue as highlighted by the participant who said ‘grief and loss, trauma, domestic violence and sexual assaults are important issues to look at.’ Parkinson disease was mentioned and it was noted that the medication used by patients can lead to ‘impulse control disorders which can worsen the drive for excitement.’

3.2.3 Summary of forum results

The final list of prevalent co-morbid disorders with problem gambling was identified. These were:

- Depressive disorders
- Anxiety disorders
- Alcohol abuse/dependence
- Drug abuse/dependence
- Nicotine dependence and
- Personality disorders (predominantly anti-social and borderline personality disorders).

While some participants in the focus group did identify a sequence of disorders, overall most agreed that ‘it depends’ on each individual’s situation.

3.3 Workshops with problem gambling counsellors

This section continues on from the previous sections concerning the identification of the most prevalent co-morbid disorders with problem gambling as well as the issue of the temporal sequencing of disorders. It reports on the findings from three workshops that were convened at the *NSW Problem Gambling Counsellors’ Conference* on the 29th and 30th April 2010. As with the earlier focus group, these workshops were conducted as focus groups and as such adopted a qualitative methodology.

These workshops were essentially conducted as three separate focus groups. Participants who took part in the three focus groups were predominantly problem gambling counsellors and financial counsellors.

Table 3-2 - Number of participants in each focus group

Focus Group 1 29 th April 2010	Focus Group 2 29 th April 2010	Focus Group 3 30 th April 2010	Total Participants
20	18	6	N= 44

However, like the participants in the first focus group, there were other interested people who attended the sessions. These included people in public policy positions, registered nurses and those in education and research. Numbers varied in each of the focus groups and the breakdown in numbers in each of the groups is shown in Table 3-2.

3.3.1 Workshop method

An overview of the research project was provided to participants outlining the aims of the study as well as the findings of the study to date. The focus groups were digitally recorded and notes taken to ensure accuracy (Puchta & Potter 2004). Each focus group ran for around 100 minutes.

The main purpose of these additional focus groups was to keep problem gambling counsellors informed of the progress of the study and to ascertain if the responses from the first focus group and the responses from the other mental health therapists aligned. This process was deemed especially important as the majority of those participating in these focus groups had not attended the first focus group. Indeed, only three participants from the first focus group participated in the later focus groups. The experiences from the problem gambling counsellors in these focus groups were considered particularly important to ascertain and confirm both the prevalent co-morbid disorders with problem gambling being concentrated on to-date in the study, as well as those concerning the temporal sequencing of disorders.

The consent process for this stage of the study included providing relevant information to participants such as: the outline of the study; the study aims; and the various research stages. Confidentiality concerns and the voluntary nature of participating in the research were also covered. Verbal consent was given by participants to participate in the study and to have the focus groups digitally recorded. As with the first focus group, data from these focus groups was coded prior to thematic analysis (Bryman & Burgess 1994).

3.3.2 Responses from the NSW Problem Gambling Counsellors' Conference

Co-morbid disorders

The final list of the most prevalent disorders that had been identified by participants in the first focus group was discussed by participants in each of the subsequent focus groups. The key purpose for generating the list with this group of participants was to undertake a consultation process to confirm (or otherwise) the disorders to be included in the subsequent survey of gamblers in treatment.

It was widely agreed that the list identified in the first focus group consisted of the most prevalent disorders with problem gambling: anxiety, depressive, substance and personality disorders. For instance, one participant said:

I'm talking from personal experience and all the clients I see with a gambling problem have all the disorders - substance, depression, anxiety and personality.

Others said 'they all present with all of these disorders'; and 'these [disorders] are typical of the people we see'.

Some participants spoke about particular disorders and the combinations of disorders. For example, in relation to depression and anxiety it was noted in each of these focus groups that these disorders have a tendency to present together - that they tend to go 'hand-in-hand'. This tendency was also highlighted in the first focus group as well as in the interviews with the other mental health therapists. For instance, a typical response was that 'clients tend to mostly have depression as well as anxiety'. Another counsellor highlighted the various anxiety disorders that clients present with stating that:

Depression and anxiety tend to come together, whether it's panic attacks, anxiety from post traumatic stress or another form of anxiety, clients tend to have anxiety disorders and depression.

One participant raised the issue of suicide and suicide ideation in relation to depressive disorders noting the 'extremely high' prevalence of both disorders:

Depressive disorders are extremely high amongst problem gamblers. And suicide ideation is also extremely high - it's massive. I would say that at least 90 percent of the problem gamblers I see say they have thought about suicide because of their gambling behaviour ... especially when they walk out of the venue and they've lost everything. That's when they're completely vulnerable.

Substance disorders were also widely acknowledged by participants in all groups to be highly prevalent amongst problem gamblers. Representative responses included: 'alcohol problems are very common with problem gamblers'; and 'many have drug problems'. Some counsellors also spoke about clients having issues with both alcohol and other drugs. For instance, the following participant gave a typical response noting that 'clients I see often have problems with drugs and alcohol'.

In relation to smoking, there was general consensus that it is important to keep nicotine dependence in the list of prevalent co-morbid disorders. Nicotine dependence was particularly noted to be important due to changes in regulations concerning smoking in venues including avenues to gamble and smoke in designated outside areas. One participant asserted: 'nicotine dependence is particularly important to look at, especially where there are outside areas where gamblers can smoke'.

Another participant noted the importance of examining nicotine dependence in relation to problem gamblers given the prevalence of smoking amongst gamblers stating: 'they all smoke'. Smoking was generally seen as problematic amongst participants as problem gamblers are left 'vulnerable due to the rising costs of cigarettes'. One person explained the situation for problem gamblers who smoke thus:

There's an attitude that people don't want to stop smoking I think because also a lot of the counsellors smoke. But it's not true, a lot of smokers do want to give up and there are so many pathways they can go down; even just giving up one cigarette per day will help. So it's an incredibly important area to look at. Smokers have had it really hard with all the government changes. Especially considering that a lot of problem gamblers smoke and problem gamblers are amongst the most disadvantaged people in our community. And they have amongst the least disposable income - well a lot of that is going on cigarettes.

Conversely, another counsellor said 'quite often they don't smoke' and another 'some only smoke two packets a week'. However, as noted, these types of responses were in the minority.

Personality disorders were also discussed by participants in relation to prevalence. It was generally acknowledged that it was necessary to keep this category in. However, as pointed out by one participant, 'it's very difficult to diagnose a personality disorder'. Comments about personality disorders, as in the first focus group and in the interviews with the other mental health therapists, generally concerned anti-social personality disorder and borderline personality disorder. For instance, one participant commented

that 'with borderline personality disorder gambling is often a part of that'. One participant pointed out:

Women tend to get diagnosed with borderline personality disorder and men tend to get diagnosed with anti-social personality disorder.

Another noted that 'the Pathways model looks at personality types and disorders and the different pathways to problem gambling'. One participant gave a general response in relation to personality claiming that 'it depends on personality whether they become a problem gambler'. Another noted the importance of including personality in relation to impulse control issues and ADHD.

Another disorder highlighted by participants in these focus groups was bi-polar disorder. For instance, in relation to bi-polar disorder, one counsellor said:

Often with people who have bi-polar disorder when they are in the manic phase they are in search for the euphoria and gambling can give them that.

Trauma, as in the first focus group, was an issue raised in these focus groups. One counsellor, for example said:

It all comes down to the trauma that a person has suffered. This leads to depression at a very, very early age which can start if the child feels unwanted and unsafe and if they don't feel loved by their parents, then their self-self suffers. So they suffer more traumas and their self-esteem gets lower and lower and they don't know how to resolve it. And as humans do, we've very good at finding some sort of coping mechanism and some people will take drugs, alcohol, gamble and some will take on the lot to escape.

Another response that highlighted the significance of trauma leading to other mental disorders was explained by one participant thus:

If they're addressing the alcohol and because they haven't addressed the underlying problem, say with trauma, it's manifesting itself into something else like a problem with alcohol.

Another counsellor also spoke about 'unresolved trauma such as grief and loss including child abuse and domestic violence' and the 'manifestation of these which lead to other issues like problem gambling'.

While participants placed importance on the impact of trauma, such as child abuse and domestic violence, and its influencing factor on subsequent mental disorders, it was noted that trauma in itself is not a DSM-IV defined disorder. However, it was also

noted that these influencing factors can lead to disorders such as anxiety, depressive and substance disorders.

Screening tools

Discussion took place concerning the screening tools used for the various mental disorders. Some participants spoke about how clients may present for problem gambling concerns but they may not be aware of co-morbid disorders. For instance, one counsellor noted:

Some clients don't recognise they have a problem with, say alcohol, but when they come to us and we do an assessment it becomes clear they do [have an alcohol problem].

It was also noted that, while counsellors cannot diagnose a mental disorder, if they suspect a client has a mental disorder then they refer the client for specialist treatment. Some of the screens discussed included:

For smoking and nicotine dependence, one participant said they ask their clients 'Is the smoking habitual or is it addictive? Do you have to smoke first thing after getting out of bed?' However, it was generally considered that the most useful tool is the Scale for Smoking Dependence used in the DSM-IV criteria.

For the other substances, discussion concerned the World Health Organisation (WHO) AUDIT for alcohol and the WHO Composite International Diagnostic Interview (CIDI) screen for other drugs.

There was general agreement amongst participants that the most appropriate tool to assess depressive and anxiety disorders is the Depression Anxiety Stress Scales (DASS).

For screening for problem gambling, one participant said that he asks two questions: 'Do you ever spend more money on gambling than you intended? Do you ever spend more time gambling than you intended?' However, it was noted that the nine item Problem Gambling Severity Index (PGSI) is the most commonly used screen to assess a person for gambling problems.

Individual differences

Gender and age were not discussed to a great extent in any of these focus groups. These variables were, however, touched on in all three groups. For instance,

participants in two of the groups asserted that 'middle aged men tend to gamble on the horses'; and 'horse racing tends to be men'. Another said that 'younger people who gamble tend to be risk takers'.

An area that was not highlighted in the first focus group or in the individual interviews with the mental health therapists in relation to individual difference concerned geographical and locational influences. For instance, one participant noted that, particularly within Indigenous communities the propensity to gamble 'can be influenced by location'. This was especially felt to be important in relation to whether the communities are regional, metropolitan, rural or remote. Other participants agreed about the importance of geographical location and noted that this was the case for non-Indigenous communities as well and highlighted the issue of socio-economic status as being a significant influencing factor concerning locational difference. One participant asserted:

With the lower-socio economic demographic, people are more likely to have gambling problems earlier on due to lack of funds, where as for wealthier people, gambling is not as likely to become a problem because there is more money coming in each fortnight.

Another counsellor noted that location is important because in certain locations gambling opportunities are more prevalent, such as 'in the Western suburbs [of Sydney] ... in poorer areas.' Also in relation to location, one participant highlighted the usefulness of utilising post codes as a guide to determining socio-economic status, although it was also pointed out that 'post codes are a rough guide only'.

Temporal sequencing

Some of the participants in these focus groups gave definite opinions as to the temporal sequencing of disorders. While comments concerning the ordering varied, the majority believed that the other mental disorders preceded the problem gambling. Typical responses included: 'alcohol and other drugs tend to be used first and then it's the gambling'; 'depression and anxiety pre-gambling'; 'depression comes before the gambling'; and 'almost all the clients I see have had significant depression before the gambling'. One counsellor explained the temporal sequencing between alcohol abuse and problem gambling thus:

I've had 11 years experience as a counsellor and with alcohol I've seen that alcohol abuse leads to problem gambling. Problem gambling seems to be the perfect cure for alcoholism because if they have an alcohol problem and they really get into gambling then people will cease the

alcohol. They will devote themselves to gambling, which is incredible. And it's pretty hard for an alcoholic to stop [drinking], it's not easy. But gambling seems to do it ... a true problem gambler will give away the drink.

However, the belief that other mental disorders preceded problem gambling was not universal amongst participants. Indeed, some believed the opposite to be the case - the problem with gambling came before the other mental disorders. For instance, one counsellor asserted:

Gambling comes before depression and gambling before anxiety ... then once they've lost their money they get pretty depressed.

Others could not proffer an opinion claiming, as did respondents in the previous interviews, that 'it's too difficult to determine'.

One explanation given for the difficulty in determining the sequencing of disorders related to the awareness of disorders (or more precisely, the lack of awareness of disorders) by clients which could influence the perception of the temporal sequencing of disorders. For instance, it was observed by one counsellor that:

People may not even be aware they have a problem with gambling until a certain age, but really they may have had a problem with gambling for a long time before they seek help ... We see them at a stage where they know they have a problem and they're desperate.

Another difficulty identified concerned the issue of whether the problem gambling was the primary or secondary disorder which was an area also highlighted in the interviews with the other mental health therapists. This conundrum was clearly articulated by the following participant:

Gambling goes very much hand-in-hand with alcohol and then you have to work out if alcohol is the primary problem or whether the problem gambling is.

The area of Age-of-Onset (AOO) was also raised by participants as being very relevant in relation to the temporal sequencing of disorders. One participant pointed out:

If you can determine the age when people start gambling then it would help with identifying the temporal sequencing of the disorders.

The nature of the relationship between problem gambling and co-morbidities

The next section of the discussion addressed in the focus groups concerned the nature of the relationship between problem gambling and other mental disorders. Like the

other therapists in the previous interviews it was widely agreed there is an association between disorders. One participant, for example, explained the association between problem gambling and alcohol thus:

Sometimes there's gambling that occurs that is moderately controlled and then when there's alcohol involved it becomes a problem.

Another observed:

When the gambling is reduced then people tend to start to smoke more and drink more. This is especially the case for low-income earners.

Both of the above examples also highlight, not only the association between disorders, but also the cyclical nature of disorders. This cycle was particularly noted by one participant who said:

Some people have a history of depression throughout their life and then they start to gamble and then they get more depressed because of the stuff that's happening around the gambling. I would say it's a predisposition to depression as they've been depressed throughout their life.

One counsellor spoke about the association between alcohol and gambling and asserted that:

Often when people are gambling they don't drink, that's what I find; the alcohol tends to distract them from the gambling and reduces their inhibitions. The die hard gambler tends not to drink.

Another issue raised was identified as being 'environmental' by the following participant:

I think it's an environmental factor. With alcohol, they see the ads on TV and then they realise their alcohol consumption is a problem, so it's environmental. It goes hand-in-hand with the gambling and the venue.

Linked to the environmental concerns is the issue of venue environment and accessibility which was also highlighted. For instance, responses involving venue accessibility included: 'it's very easy for clients to access gambling venues'; and 'clubs and pubs are everywhere'.

In addition, others raised the issue of clients using gambling to escape from stress. One counsellor noted that: 'some clients use gambling as an escape mechanism'.

Others noted the social factors, such as family influence as important. This was also identified as being linked back to environmental concerns. For instance, one participant

linked the ordering of the disorders and social factors in his responses and noted that 'I think it can also depend on the family. With one client I saw their grandparents gambled'. Another said 'the dad put bets on for one of my clients when he was too young legally to gamble'. One counsellor alluded to the cyclical nature of the gambling and explained the socialisation factors associated with gambling and co-morbid disorders thus:

The dad's always gambled, then because of the gambling they then develop depression and other things. So because the person has enjoyed going to the races with Dad then it becomes a problem. There is certainly a relationship - they are all tied in together.

'What's missing?'

This part of the discussion concerned 'what's missing' in the research so far. An issue raised concerned the best way to administer the next stage of the study - the survey with problem gamblers in treatment - with a number of approaches of how to conduct the surveys suggested. These included: an on-line survey, surveying via telephone and face-to-face surveys/interviews conducted by counsellors in conjunction with therapy sessions. Some comments in relation to these approaches included: 'you could survey via telephone, but it's hard to catch people at home'; 'when you phone people to do the survey, if they have someone else there they're not likely to disclose information'; and 'on the phone people sometimes want to get off as quickly as possible so you might not get the correct information'.

In relation to a mail-out survey methodology, it was generally thought that surveys conducted in this way were unlikely to yield an adequate response rate. Responses concerning mail-out surveys included: 'the return rate is notoriously low for mail-out surveys'; and 'not a postal survey, people aren't good at returning things by post'.

There was, however, considerable interest in a face-to-face survey methodology. For instance, one participant noted that 'people are more likely to do the survey if it's done with the counsellor face-to-face'. Other counsellors asserted that:

It's not always good for the client's self-esteem to fill in a survey so it's best for them to ask them when the counsellor thinks they're capable of doing it. We can also explain the survey to them in person.

Another noted the importance of building rapport with the client prior to completing a survey explaining that:

I think it's best to do a survey person-to-person with the counsellor as the counsellor has already established a relationship. Also the counsellor knows when it is the best time and stage in the counselling relationship to approach the client about the survey because you don't want to bring up all the negative things associated with the client's gambling situation at the wrong stage [of therapy].

3.3.3 Summary of workshop responses

The participants in these focus groups widely agreed about the inclusion of the co-morbid disorders identified in the first focus group. As with the previous interviews, participants in this stage mainly believe that it is difficult to ascertain the temporal sequencing of disorders. However, some participants gave definite opinions as to the ordering of disorders. Of those proffering an opinion, the majority believed that the other mental disorder comes before the problem gambling. However, this opinion was not across the board. As with the other interviews, participants largely agreed that there is a tendency for disorders to present together. The discussion of the findings from the first focus group, the interviews and the subsequent focus groups follows.

3.4 Interviews with mental health therapists

This section focuses on the interviews with mental health therapists. First the methodology is addressed followed by the findings from the interviews. Findings are presented in two sections: interviews with substance therapists and interviews with generalist mental health therapists.

3.4.1 Methods

Purposive sampling was utilised for this stage of the study in order to gain a representative sample (Neuman 2000) of therapists who specialise in either: substance disorders; other mental disorders including depressive disorders, anxiety disorders; and personality disorders. These disorders were identified in the gambling literature and confirmed in the focus group as being the most prevalent disorders. In addition, purposive sampling enabled national representation of therapists from around Australia and included therapists from all states and territories and for each group of disorders.

The mental health professionals who took part in this stage of the study were sourced from appropriate help agencies known to the researchers. Other participants were sourced through relevant web searches including: beyondblue; Relationships Australia; and Drug and Alcohol services, in an attempt to ensure a diverse national sample of services. Of the services approached, 25 declined to participate for various reasons

including: they were too busy; they did not have a suitable therapist with the relevant expertise; they did not feel they had anything to offer the study; or they simply failed to reply to our invitation to participate.

There were a total of 15 substance disorder therapists, and nine generalist mental health therapists interviewed for this part of the study. The breakdown of therapists who participated in the interviews state/territory by state/territory is shown in Table 3-3.

Table 3-3 - Number of therapists interviewed by State

ACT	NSW	NT	QLD	SA	TAS	VIC	WA
2	5	5	2	2	3	3	2

Note on terminology relating to mental health therapists

While it is acknowledged that all the therapists interviewed for this stage of the project are mental health therapists, for ease of differentiating the two groups of specialists two main categories were established. These are identified as:

- Substance therapists: i.e. those particularly specialising in either alcohol and/or other drugs including nicotine; and
- Mental health therapists: i.e. those with expertise in either and/or depressive disorders, anxiety disorders and personality disorders.

Interviews

The semi-structured telephone interviews were guided by the findings from the focus group with problem gambling counsellors as well as the literature on problem gambling and co-morbidity. Therapists with expertise in one or more of the identified areas were approached and asked if they were interested in participating in the research. Twenty-four semi-structured interviews were conducted with therapists who have expertise in a specific mental disorder/s which included: substance abuse/dependence (drug, alcohol and nicotine); depressive disorders and/or anxiety disorders; and/or personality disorders.

The interviews were conducted on the telephone and were guided by schedules relevant to the particular disorder/s. Minichiello et al. (1996) note that it is difficult for the researcher to remember all that needs to be covered and it is for this reason that an interview guide or schedule is often used. The interviews each took no longer than 30

minutes to complete and were digitally recorded and then transcribed verbatim by a professional transcribing service to provide an accurate account of each interview (Minichiello et al. 1996). Minichiello et al. (1996) point out that recording the interviews enhances the authenticity of the data.

The main purpose of the interviews with the mental health therapists was to provide insight into the issue of problem gambling as the secondary co-morbid condition. The mental health therapists also provided insight into the temporal sequencing between problem gambling and co-occurring disorders as well as insight into the relationship between non-gambling conditions. The responses from the interviewees helped inform the later stages of the research.

Data analysis

Consistent with approved methods of handling qualitative data (Ashton-Shaeffer 2001; Rubin & Rubin 1995), transcripts from the interviews were analysed and coded with key themes identified. That is, underlying themes were identified and thematically coded which is a method known as thematic analysis. Thematic analysis identifies, analyses and reports patterns within data, by organising and describing the data set in detail. The researcher/s then interprets various aspects of the research topic (Braun & Clarke 2006).

Consent process

Like the participants in the focus group, all participants who accepted to be interviewed were given background information about the study. The consent process included: the provision of Information Sheets to participants describing the interview process, the aims and importance of the study, confidentiality and the voluntary nature of participating in the study.

3.4.2 Interviews: Responses from substance therapists

Background information on substance therapists and services

Fifteen substance therapists participated in this group of interviews. The first question concerned the therapist's experiences. The length of time as a substance therapist varied considerably and ranged between one year and 30 years. The average length of time as a substance therapist was around 10 years.

The next area addressed was how clients found out about the service. All but one service had a combination of referral modes and the majority of services had a fairly even balance of both referral and self-referral as indicated by the following comments: 'clients can be referred from doctors or they refer themselves'; 'some clients are referred through GPs and a lot of clients, they just present'; and 'I'd say clients would be 50/50 - self-referral and referral from other areas'. Only one service mainly saw clients who were referred. A further therapist identified that clients primarily self-referred to their service.

Co-morbid disorders

Participants were then asked if their clients mainly had either a drug or alcohol disorder or whether clients mainly had both drug and alcohol issues. Overwhelmingly, the majority reported that clients usually have issues with both. Some comments included: 'mainly people have both drug and alcohol disorders'; and 'it's mainly both drugs and alcohol'.

Some therapists discussed the distinction between the primary and secondary drug use. For example, one noted that 'it's very rare that it would probably be just one substance, like purely alcohol. There's always a secondary drug of concern' while another concurred, noting that:

Most of our clients have both drug and alcohol disorders but there's a primary drug of choice, always. It's always either alcohol or they smoke pot or they do heroin and they drink a bit.

Several therapists spoke about poly-drug use noting that:

The majority of people would be poly-drug users. ... of course a lot of people who drink alcohol will also smoke cannabis and use sometimes, some other drugs as well. And nicotine.

Other comments concerning poly-drug use included: 'most clients are poly-drug users'; and 'unfortunately most of them are poly-substance users'. However, three therapists said that their clients 'usually have, it's either a problem with alcohol or another drug'. Another participant said that the type of drug used depends on the age group and was quite specific in determining the age range. She said:

If we are seeing 38 to 42 year olds then you can just about guarantee you've just got the one drug, which is usually alcohol. If they're between 28 and 32 we're seeing alcohol and/or amphetamines, marijuana etc. It's an age group thing.

In addition, participants were asked whether they treat clients for nicotine disorder as nicotine dependence was a disorder that was highlighted in the focus group. The general feeling was that treating nicotine dependence was 'not a priority' as clients often sought treatment for their other drug and alcohol use first. One therapist explained:

I have a reluctance to treat nicotine dependence ... because really early in recovery people's coping mechanisms are, well, first things first and that's the way I approach it. If someone really wants to [stop smoking] I'll look into it.

Other services 'treat people for nicotine dependence if that's something they want to work on', dedicating resources 'tobacco counselling and Pharmacia therapy prescribing ... a psychologist that is designated just to tobacco'.

Another area identified in the focus group that was drawn on in the interviews was whether therapists differentiate between dependence and abuse. Some of the therapists saw this as an important issue while others clearly did not, with one commenting that 'it's all misuse', while another thought these were 'very similar.'

Others, however, were certain of a distinction between the two with one therapist noting that 'people can use alcohol or drugs without actually being dependent on them.' It is necessary to differentiate between dependence and abuse for treatment purposes, as this therapist explained:

You might think of more bingeing as abuse, however if people meet the criteria of dependence there's withdrawal symptoms, there's a tolerance, they've used for quite a long time and they've tried to give up. If they meet those criteria of dependence then they are dependent ... certainly the doctors would [differentiate between dependence and abuse] because that would affect the treatment.

Determining whether a client was dependent upon or abusing a substance was determined either via screening - 'we actually have an assessment tool ... and we look at the signs and symptoms of that' or by the client's perception of what their issue is; we don't dispute them if they say they're dependent and we'll work with that.'

Assessment/diagnosis of clients: Screening for substance disorders

Therapists were asked about the tools they use to assess or diagnose a substance use disorder, with most reporting that they do not use any formal tools. One respondent said 'we don't diagnose using the DSM-IV or anything like that' and another 'we usually don't have to do the [formal] testing to see if they've got a problem', although if 'the

counsellor decides that they want to use one of the assessment tools as well then they can.' Others noted that they did this full assessment, despite the fact that 'most of the people that come into us are really good as they've identified a problem themselves.'

These therapists do what they variously called a 'comprehensive assessment', a 'clinical assessment', a 'full assessment', and an 'extensive assessment' which it was noted takes up to one and a half hours and covers a broad range of areas including the physical, the psycho-social, environmental, financial, family and other relationships, employment and housing etc. For example, one therapist asks questions such as 'Is your life becoming unmanageable?' and, where the client indicates 'yes, my life is unmanageable, I've lost my job, my family's falling apart', then a drug and alcohol assessment will follow.

This process involves 'taking the client's history, how drugs and alcohol affects their lives, how they can't stop', while another commented that after they had given the client a full assessment, which also involves a 'mini-mental examination' if they have identified 'something that's a little bit not quite right' then they are referred to 'the specialty unit'.

Screening for other disorders

Along with screening for drug and alcohol disorders, participants were asked if they also screen for other disorders. Nine of the therapists reported they use specific tools to screen for other disorders, particularly 'high prevalence' disorders such as depressive disorders and anxiety disorders. One therapist said their service 'screens for dissociation, depression/ anxiety, hopelessness and social anxiety'. Another said:

We screen for high-prevalence disorders like anxiety, depression. We are starting to work towards being better at screening for - we're not calling it personality disorders specifically because personality disorders do take a variety of skill and training. We're looking for treatment interfering behaviours so some of the criteria of someone who actually might not be diagnosable but might simply have warning signs of someone who might struggle with treatment. So we've integrated some formal tools into the assessment [such as] the DSM-IV and integrated some things like family, family abuse or neglect or suicidal behaviours and actions and multiple treatment episodes ... so that people are starting to think about those things. Again not diagnosis but implementing new reflective practice.

Other tools identified by the substance therapists included: the Beck Depression Inventory; the Depression Anxiety Stress Scales (DASS) and the PsyCheck for

screening for 'anxiety and depression which often goes hand in hand with the alcohol and drugs'.

Participants were then asked what co-morbid disorders were most prevalent with drug and alcohol disorders. 'Everybody will have levels of depression and anxiety. They're the first two that stand out' said one respondent, a finding echoed by most other respondents.

However, other not so prevalent mental disorders were identified including schizophrenia which was identified by several therapists. Personality disorders were also spoken about by five of the participants as a co-morbid disorder that presents with drug and alcohol disorders. As one participant said, 'we get a lot of personality disorders... that seems quite prevalent.'

Another elaborated, saying:

There's probably the full spectrum there from the mood disorders, the psychoses. We also get probably in chronic dependence, the usual character logical problems at the Axis 2 level ... With chronic dependence situations you can inevitably expect there will be Axis 2 problems. Not necessarily at the level of personality disorders per se, it may only be in aspect of their character; narcissism can be prevalent, depression and anti-social personality traits.

Another therapist identified personality disorders as one of the 'three big ones' noting that:

We primarily see borderline personality disorder, anti-social personality, depression and drug and alcohol, anxiety, drug and alcohol. They'd be the three big ones. So personality disorders and depression/anxiety.

Eating disorders were also identified along with obsessive compulsive disorders and again personality disorders by the following participant:

The disorders that I do see with alcohol and drug use are eating disorders and sometimes obsessive compulsive disorders, and personality disorders - predominantly borderline personality.

In relation to gambling specifically, one therapist noted:

Most of the people that I do work with for drug and alcohol issues say "I gamble a bit, I've gambled" but gambling certainly isn't their primary issue.

Screening for problem gambling

Participants were then asked if they screen for problem gambling, and if so what tools are used. Five of the therapists interviewed reported they do screen for problem gambling as part of the initial assessment. Two of therapists said: 'we don't screen for gambling disorders' and 'from my perspective I haven't had the occasion to screen for problem gambling'.

Others noted that, while problem gambling is not formally screened for, it is 'picked up because of our comprehensive assessment'. Another said:

There are a couple of concerns for me that I know are out there and growing like sexual addiction, gambling, eating issues. All of those things are not necessarily formally looked at. I think most of the clinicians would look for signs about any possible behavioural problems and gambling would certainly sit in that category. But do we formally use anything? No.

One therapist noted that in their clinic, problem gambling has not presented 'as a primary problem'. She further explained:

Gambling might come up occasionally when we're looking at how they're managing their finances. I think a couple of the women with borderline personality disorders certainly did some gambling but it was not their primary problem really, merely collateral ... Gambling is one of the high risk behaviours in the borderline personality disorder people.

One therapist noted that they had not treated any clients with a problem gambling disorder, while another said that it is important to 'just ask the question [about gambling]'. This therapist further explained:

The person might not be willing to deal with it [the gambling] straight away but they know that you've asked the question so it gives them permission to bring it up with you again. Even if it's not about their own gambling but a member of their family.

Individual differences

Participants were asked if there was a difference with who they see with problem gambling and drug and alcohol disorders - if, for example, they mostly see men or women, younger or older people. In relation to gender, most of the therapists reported they see both men and women of all ages. One respondent said 'I've seen an equal balance of male and female'. Two said they see 'probably more frequently men than women' and 'I would say more men'. One explained they see more men due to reflecting their 'client profile in drug and alcohol'. However, the majority reported that 'it

can be anybody' and 'it's probably 50/50 males and females who are problem gamblers'.

In relation to age, five therapists said they 'see mainly younger people' with one saying 'it's mostly people in the 20s and 30s', and another 'mainly it's the younger age group, say cutting it out about 38'. One reported that 'it's mostly younger people due to access to financial resources' and another identifying younger people gambling 'is tied in with the yuppie lifestyle'. Others, however, said they see 'young and old equally', and 'we see a mixture of older and younger people'.

One therapist related their response to co-morbidity and to personality disorders and incorporated gender, age and type of mental disorder (i.e. personality disorders - borderline personality disorder) stating that:

From my observations, perhaps people who have personality disorders are more likely to demonstrate high risk behaviour. Borderline personality disorder perhaps is a pattern we might see. Of course there are ... younger females who have been diagnosed with borderline personality disorder than males.

Temporal sequencing

Of particular relevance to this study was the next set of questions concerning the temporal sequencing of disorders - between drug and alcohol disorders and problem gambling. Interestingly, of all the responses to this question no-one reported explicitly that the problem gambling came first.

Almost half (seven) respondents said that 'the drug and alcohol abuse comes first'. For example, some responses included: 'alcohol, gambling - the drug then the gambling and then the fix, the addiction, chasing the high'; 'certainly the drug and alcohol first'; and 'I think the drug first'. However, even though seven participants proffered an opinion, three prefaced their answers in a way that would indicate they do not believe there are hard and fast rules about this. For instance, indications of this included: 'the substance abuse appears to be the more compulsive behaviour rather than the other way around'; and 'I would say the drug and alcohol, for me in my experience, comes first and then the gambling'. While the other therapist did give an opinion, this participant prefaced their response with 'it can go either way' and then went out 'on a limb' and said 'drug and alcohol first'.

Five respondents said that it can be either way - 'the drug and alcohol problems first and then the problem gambling or vice versa'. Typical responses included: 'I don't

think I have an answer, I've seen both'; I've known that the core problem is gambling but their lives become more unmanageable with the alcohol use ... and the other way round as well'; 'It's going to depend on the individual. That can come either way', and 'I guess both disorders - problem gambling and drug and alcohol - is sort of lack of impulse control. I think it's really hard to say which came first'. Another explained that:

It's really different for different clients. With clients who have come in for drug and alcohol counselling, I often find if you do an assessment you can find that in their past as having a gambling problem and it's almost that they've transferred across to drug and alcohol instead. The other way around as well. Often people who come in for gambling counselling have previously had a problem with drugs or alcohol.

Three people related their response to 'the chicken and the egg' allegory: 'I guess it's like that chicken and the egg, what comes first?'; and 'I suppose it's a little bit chicken and egg'. Another elaborated on this theme:

That's a chicken or the egg question! ... I mean sometimes it's beautifully offered to you. ... But often it's very hard to unpack all those things. Sometimes it comes out "oh yeah, I was in high school and I started to withdraw and my self esteem diminished and before that I hadn't been drinking." Sometimes you get those clear indicators but sometimes people don't even know. They don't remember.

Two participants answered that for the clients they had seen with drug and alcohol disorders and problem gambling, the disorder has occurred at 'around about the same time'.

One therapist explained that while 'it's really hard to say which came first', she felt that 'the behaviours trigger each other'. She spoke about the interconnectedness of behaviours and how both disorders are 'a part of that whole destructive pattern'.

Another important point raised by several participants was the nature of the service itself being accessed - i.e. a drug and alcohol service for substance disorders - which would impact on the temporal sequencing of disorders. For instance, one therapist explained that 'because we're a drug and alcohol agency people come to us for issues concerning that and then people's gambling seems to be a side problem'. Another explained that the substance disorder was the primary concern for the clients seen and then the problem gambling was the secondary disorder.

The nature of the relationship

Participants were then asked about the nature of the relationship between problem gambling and drug and alcohol disorders. All agreed that the drug and alcohol disorders and gambling problems are associated - that there is a tendency for disorders to present together. One participant noted: 'I do say they're associated ... Simply because I am in this agency that's what people present with'. Another said 'I would actually say they are associated'. One participant described the association as 'a cycle' and explained that:

They take the drugs to cope with anxiety, they end up depressed so they take more drugs, end up anxious, take more drugs, end up depressed.

Another said:

I see both substance dependence and compulsive behaviours like gambling and sexual addictions and so on as a symptom of an underlying disorder, usually of the self. When aspects of the self can't be managed then they are displaced through these sorts of things like gambling.

Stress was also raised in relationship to the association of disorders. For instance, one therapist explained that the association with one woman she has seen was:

Stress related ... she had a lot of stresses in her life ... the only way she could get her stress down was to stop gambling. This woman gambled 'as a release from the stress of ordinary life and then of course the gambling causes more stress on top of that.

Another two therapists identified 'the rush' that is involved with both drug and alcohol use and problem gambling. For example, one stated that:

There seems to be that level of the rush with the drugs, how that makes them feel. That they feel excited, they feel good about that ... that's the rush and also the gambling as well ... I think gambling and drugs might be associated only from what clients have said the way that it makes them feel, with the rush. And that's probably how they've explained it, with the rush. It's just that feeling that they get, that euphoric feeling, maybe it increases serotonin levels, I don't know.

Others identified the association with personality disorders, in particular borderline personality disorder and anti-social personality disorder with one therapist claiming 'it's predominantly borderline personality and anti-social personality'. Another said 'personality disorder, certainly it's the addictive personality'.

Others asserted that the relationship between drug and alcohol disorders and problem gambling concerned 'feelings'. For example, one therapist noted:

There is a relationship ... they're both ways of dealing with feelings so you can medicate yourself in both those ways as both serve the same purpose.

The relationship between the gambling environment and alcohol use was identified, with one therapist saying:

I think it's particularly the environment, the venue, they're drinking and there are poker machines ... It was the club scene; smoking, drinking and using the poker machines and that whole environment that provided that artificial stimulation.

In a similar vein others noted environmental concerns:

It seems to be the poker machines involved with smoking and drinking and the other impulse behaviour as well, people gamble when they're drinking.'

Another highlighted the racecourse gambling environment noting that:

The people I see with alcoholism who are also problem gamblers are predominantly racecourse gamblers and you can associate most of that with atmosphere, I suspect.

The following therapist linked their response to both the 'environment' and to 'feelings':

If something works then you continue to do it. If you can deal with your feelings by means of either of those two things [using drugs/alcohol and gambling] then you'll do it and if one of them works better than the other then your tendency is to do that and if they both work you'll do both. Also, if your gambling puts you in the environment where there's alcohol your tendencies are that you are going to drink alcohol. Why would you say no to something that will help you suppress your feelings? A lot of it is environmental.

Other therapists commented on the aspect of cause and effect of drug and alcohol disorders and problem gambling. For instance, one therapist again tied their response to the gambling environment when discussing cause and effect:

I don't believe one causes the other, I just believe when you sit in there on the machines and everyone's having a drink you do as well.

Another said:

I don't think one causes the other, but I think they're associated. The reason I don't think that one causes the other is because the cause of

problem gambling is, I believe, intermittent reward. And the problem with drug and alcohol is the instant gratification.

Finally, one substance therapist spoke about cultural influences and the importance placed on luck for some cultures in particular. She explained that:

We have a lot of different cultures here where that belief in luck starts off the gambling and then we would have the other issues around the drug and alcohol potentially coming into play after that.

3.4.3 Summary

The length of time as a substance therapist varied considerably and ranged between one year and 30 years with an average of around 10 years. All but two services utilise a combination of referral modes: referral and self-referral. Most therapists reported they see men and women, younger and older people equally. While six therapists said that the drug and/or alcohol disorder usually came before the problem gambling, most of these did acknowledge that the temporal sequencing of disorders can, however, go either way. This was indeed the general consensus amongst the therapists interviewed. All agreed that drug and alcohol disorders are associated with problem gambling - there is a tendency for disorders to present together. The next section reports on the interviews with the next group of mental health therapists.

3.4.4 Interviews: Responses from mental health therapists

This second part of the interview section reports on the responses from the other mental health therapists. The majority of these therapists had expertise in either and/or depressive disorders and anxiety disorders. However, like the substance therapists, some of these therapists also had expertise in the area of personality disorders as well as other disorders such as eating disorders.

Background information of mental health therapists and services

Nine mental health therapists participated in this group of interviews. The first question asked in the interviews concerned the mental health therapist's experiences. The length of time participants have been a therapist ranged between four years and 32 years. The average length of time as a therapist was around 13 years.

The next area addressed in the interviews concerned the referral process for clients accessing services. It was reported by most therapists that clients are mainly referred to their clinics. Only two therapists reported that clients can either be referred by their

GP or they can be self-referred with one explaining that 'people can either self-refer or they are referred'. One therapist reported that clients are self-referred to their service.

Co-morbid disorders

Participants were asked if they mostly see people with depressive disorders or anxiety disorders or whether clients mainly have both disorders. The most common response was that clients generally have both depressive disorders and anxiety disorders with common responses including: 'depression is often co-morbid with anxiety' and 'generally if they've got one [either depression or anxiety] they do have a bit of the other'. One psychologist explained:

Some come with a combination of depression with post traumatic stress disorder. Others are a combination of depression with OCD. Others with a combination of depression with generalised anxiety disorder ... so they all have anxiety but they're very different conditions. But the most common anxiety disorder is generalised anxiety disorder and the most common depression that we see is Major Depressive Disorder ... and most of these are chronic.

Another psychologist noted that:

I suppose psychologists' and counsellors' bread and butter is depression and anxiety. Probably approximately 20 per cent of the population will have a depressive episode or an anxiety problem ... at some stage in their life about one in five people will ... They often go hand-in-hand.

Assessment/diagnosis of clients: Screening for depressive and/or anxiety disorders

Therapists were asked how they assess/diagnose depressive and anxiety disorders and what tools they use. Six reported they use 'clinical diagnostic interviews' and 'take the client's history'. Some of these therapists also said this interview is followed up with other tools. For example, one therapist said they use: 'generic measures such as the DASS followed up with symptom specific measures'. Other tools identified included the Beck Depression Inventory, PsyCheck, the Kessler 10 (K10) and the DSM-IV criteria. Some noted they use a mixture of tools with one participant saying:

We use the DSM-IV criteria, clinical interviews and we also use the DASS scale and we use what's called the Mood Assessment Program which is owned by the Black Dog Institute.

The most commonly used tool was the Depression Anxiety Stress Scales (DASS) (identified by five therapists) but it was noted they use it in conjunction with other assessment strategies, most notably the taking of the client's history.

Screening for other disorders

Participants were asked if they screen for other disorders and what are the most prevalent co-morbid disorders with depressive and anxiety disorders. Disorders were diagnosed within the initial history taking as well as through the other tools noted above.

Prevalent co-morbid disorders identified included substance abuse with one therapist reporting that 'alcohol and another substance - they're pretty much the main co-morbid issues'. As well as identifying substance abuse, one therapist differentiated abuse from dependence noting that 'the most common co-morbid health disorder we primarily see with anxiety would be substance usage. It would be more substance abuse than dependence.'

Other comments concerning the most prevalent co-morbid disorders included: 'one of the disorders that tends to come up for me is Aspergers syndrome'. Three others identified 'personality disorders' as a co-morbid disorder with anxiety disorders and depressive disorders. A couple of participants also identified eating disorders: 'I think anxiety and depression, probably personality disorders and eating disorders'. Another disorder identified was attention-deficit hyperactivity disorder (ADHD).

One therapist spoke about how some clients have a variety of anxiety disorders and depressive disorders as well as other disorders that include personality factors. He commented that:

Usually clients could have anxiety as a major disorder like PTSD, panic disorder, Generalised Anxiety Disorder or social phobia, agoraphobia and they might have depression as a secondary factor to those anxiety disorders or they might be referred for a mood disorder such as depression resulting from a non-melancholic depression that's resulted from a stressful situation in their life like a marriage breakdown or violence or somebody dying etc. Then they tend to become stressed as a result of a pre-disposition based on their personality factors of how they deal under stress.

Screening for problem gambling

Participants were asked if they screen for problem gambling, and if so what tools are used. Seven therapists indicated that problem gambling is screened for within the initial clinical interview. For instance, one therapist said 'yes, it does come up in interviews' and another 'yes, that's one of my questions in my interviews'. Three explained the process they follow in greater detail:

Patients normally mention to us when we do a history taking of any other symptoms like gambling etc. That's part of the history taking ... [by asking] what led them to come and see us? It usually arises. Not all the time because problem gamblers usually like to hide the fact that they're gambling. They don't see that as a problem where it really is a problem.

One explained the procedure he follows thus:

First I ask verbally, I ask if there is any addiction ... I ask common things like "what do you do to make yourself feel better when you're anxious or depressed?" And they might say "well, maybe I go to the Casino sometimes" and then I start to investigate that.

Another participant noted:

I don't get clients to do a written assessment for other disorders but as part of my clinical interview and at the initial session assessment I'll be looking for other things ... I'll be looking out for either sub-groups within anxiety like panic attacks. Also alcohol and other substances, and I will look out for gambling ... because I have a background [in problem gambling counselling] I'll look out for it and if there's any suggestion of spending time at the club or something like that then I will follow up and ask questions about their gambling.

The remainder said they do not screen specifically for problem gambling with one therapist noting: 'no, I don't ever screen for gambling problems'. One therapist explained why the screen for problem gambling is not applied in their clinic thus:

I guess [problem gambling has] always been seen as a specialist area catered for by non-Government organisations and not as a mainstream psychology area.

Individual differences

Participants were asked if there was a difference with who they see with problem gambling and anxiety and depressive disorders in terms of gender and age.

Responses varied considerably. The majority, however, noted they mainly see 'middle aged' and 'older people' with one therapist more specific in identifying a particular age group noting that 'people I've seen would be in their late 30s, early 40s and have been

predominantly male'. One therapist noted they see problem gamblers who are 'mainly men in their 20s and 30s'.

It was reported by the majority (six therapists) that men are more likely than women to be problem gamblers but this was not across the board with one therapist noting that 'men don't seem to gamble as much as women ... women go and want to chill out and relax from work and stress, and what they call stress is basically anxiety. Conversely, two others said 'it's about even, men and women' and 'it seems to be equally balanced'.

Temporal sequencing

Of particular relevance to this study was the next set of questions about the temporal sequencing of disorders - between, for example, depressive and anxiety disorders and problem gambling. The majority of mental health therapists (six) believe that the mental health disorder (depressive and/or anxiety disorder/s) usually come before the problem gambling. However, three of these said that that this was not always the case.

Never-the-less, several therapists were quite firm in their answers that the mental disorder, usually a depressive disorder and/or an anxiety disorder, came before the gambling problem. For example, one therapist said:

This is quite clear for me with our initial assessments that people discuss with us their views that the anxiety comes much earlier than drug and alcohol and gambling. Clients report that they had experiences as children or adolescence or they notice their anxiety first.

Another was even more adamant with his response noting that 'definitely, undoubtedly the mental disorder comes before the problem gambling'.

However, while other therapists may have given an opinion as to the ordering, they did acknowledge that there are no hard and fast rules, as noted by one that he would 'stick my neck out and suggest that anxiety comes before the problem gambling, more often than not'. He also noted that it depended on individual cases. Along a similar vein another noted, that while not always the case, 'I'd say the depression and anxiety have probably come first and then the gambling may come out'. Another said: 'I'd say it's probably a result of depression and anxiety. That's my impression, but it depends on the condition being treated'.

Of particular note is that only one therapist reported that problem gambling was more likely to come before the mental disorder noting that:

I think people with a gambling problem can develop depression, anxiety and stress as the result of their actual gambling addiction. It's more likely to happen that way and less likely to happen the other way around. We do see patients who have a mood or anxiety disorder and then have a gambling problem because that's their way of getting away from the real world. But it's more likely to happen that the person with the gambling problem may develop a disorder as a result of not coping with their stress, which is usually financial.

However, one therapist, who had previously worked as a problem gambling counsellor, pointed out that the sequence was dependent on whether the client had approached the therapist initially for their gambling problem or their anxiety disorder; whether the anxiety disorder was the primary concern or the problem gambling. He explained it thus:

I think when I was working at the Problem Gambling Service, people would come in with their gambling as their primary issue and for them I think that the temporal order was, not all the time but most of the time, gambling then depression/anxiety. Whereas, I think for the people I've seen, it probably has been more the other way around. I think that particularly to do with post-anxiety symptoms. Anxiety first and it leads to gambling as a way of coping and switching off from that anxiety, particularly pokie playing.

Similarly, another respondent made a comparable point concerning the nature of the mental disorder pointing out, when giving an example of a client, that 'the mental problem preceded the gambling ... [but] it obviously depends on the referral and what they're here for ... they're people who are coming for mental problems as opposed to gambling issues'.

Again, as in the substance therapist responses, 'the chicken and the egg' allegory was referred to. One participant said:

It's the chicken and the egg. I think that some people have deep clinical depression and that causes them to seek alcohol or gambling [but] I wouldn't say that everybody that's a problem gambler is depressed or anxious ... I think for some people though gambling is mood related; anxiety or depression or emotion related.

Another therapist gave two examples of clients he had treated for problem gambling. In one example he described a person where the gambling problems came before the depression and in the other the depression and anxiety came first. He concluded that 'it can be either way'. Another therapist simply said 'you just can't tell'.

The nature of the relationship

Participants were asked about the nature of the relationship between problem gambling and depressive and anxiety disorders. All agreed that there is an association between problem gambling and anxiety and depressive disorders and that there is a propensity for disorders to present together. A common response was 'yes, definitely, there is an association'. One person said that 'in cases I have seen, the gambling problem was an adjunct, like a symptom of a person's emotional state'.

One therapist explained the cause and affect associated with problem gambling and mental disorders and how she believes that 'gambling can prevent depression':

There's both the cause and effect. We also find that some people who have a gambling problem and then they try to give it up can actually become depressed because they have relied on the gambling to actually lift their mood. That's their social interest, that's their recreational interest, takes them out of their time during the day and then when they give up the actual gambling they can become depressed.

'To escape' was therefore another reason given for gambling. Some therapists suggested that problem gambling and anxiety and depressive disorders are 'related in terms of causation' as explained by the following participant:

... In some of the people I've seen with gambling problems, it does provide an escape from that feeling lousy all the time, both in terms of mood and in terms of getting anxious.

Another agreed saying 'they're escaping their anxiety'. This notion of 'escape' is similar to other reasons given by the mental health therapists for gambling such as 'avoidance' and 'displacement'. One therapist noted: 'I think gambling is a kind of displacement of emotion, negative emotion', while another, when talking about avoidance explained:

Avoidance of emotional processing is what perpetuates emotional distress and I think that avoidance is done by blocking out and distracting and things like that and I think gambling is one of those kinds of mechanisms ... I think the individuals that have difficulty with emotional processing have never had to or dislike taking responsibility for their personal feelings. I think the gambling is a way of avoiding that responsibility yet again in another way.

Having 'an addictive personality' was seen as being a mechanism for the relationship between problem gambling and depressive and anxiety disorders by several therapists. One person explained that:

Whether it's drug and alcohol or gambling or internet, which is another one, there are genetic predispositions to, like addictive personalities as we best call it, so there are some people who are at higher risks of developing addictions'.

Another also linked the association of the two disorders to 'personality disorders'. While another simply said 'I think gambling is an inherent part of human existence'.

One therapist, while acknowledging an association between disorders, also discussed the issue of various pathways to becoming a problem gambler. This therapist asserted:

I certainly think there are multiple pathways to gambling problems and that it doesn't necessarily have to be part of the depressive or anxiety problem. But, yes, there's an association in terms of maintaining factors that interact.

As in the substance therapist interviews, the importance of cultural influences was also highlighted by one participant who said:

Sometimes problem gambling comes up in some cultures, especially in very male dominated cultures ... I think culture is probably really important. There are very different belief systems operating around gambling within cultures ... for example, beliefs in luck.

Two therapists spoke about psychology theory behind gambling, particularly noting the concept of 'intermittent reward' in relation to poker machine gambling. For instance, one therapist said:

People have a few wins which reinforces that behaviour, so then they become obsessed with gambling. The psychology behind gambling is to do with all those early behavioural studies that Skinner and his colleagues did that showed that intermittent reinforcement is the most powerful reinforcement for humans, for animals, and because gambling is intermittent reinforcement and so "just one more pull or push of that button or one more horse race and I'm going to get all that money back" is a very powerful motivator.

While not all of the therapists interviewed had a definite opinion about the temporal sequencing of disorders, all noted the importance of research concerning both the sequencing and the relationship between co-morbid disorders. The importance was especially noted in the relation to treatment, and this was particularly highlighted by the following participant:

Often people with co-morbidity fall through the cracks [in relation to treatment] because the gambling service says, until you do something about their depression and anxiety, we can't treat them. And then we say to the gambling service or the drug and alcohol service, until you do something about that drug and alcohol problem, we can't treat them and

so these poor people are left stuck between the two. And so the co-morbidity stuff is a real problem.

3.5 Summary of therapist findings

The length of time as a mental health therapist varied considerably - between one year and thirty years. Clients are mainly referred to the clinics by GPs. Most therapists reported they see mainly middle aged and older people and men are more likely than women to be problem gamblers. While the majority of therapists (seven) did give an opinion as to the temporal sequencing of disorders, for example that depressive disorders and/or anxiety disorders come before problem gambling, three of these responses were tentative in nature. Evidence of the tentative nature of responses included phrases such as: 'more often than not'; 'I'd say'; and 'probably'. One therapist said that the sequencing of disorders can go 'either way'; while another said that problem gambling often comes before the other disorder/s. Others, even though offering an opinion, also noted in their responses that the sequencing was dependent on the condition being treated. Clearly, the results from these interviews are inconclusive. All agreed that there is a relationship between disorders and those disorders tend to present simultaneously. Therapists acknowledged the importance of research concerning the temporal sequencing and relationship between co-morbid disorders particularly in relation to treatment.

Chapter 4 Problem Gamblers in Treatment

This chapter presents the results from Stage 3 of the study. The purpose of this stage was to provide information about problem gambling and other disorders through a survey of problem gamblers in treatment. From the interviews with therapists (Ch. 3) considerable thought was given to face-to-face interviews of problem gamblers by their therapists as the best means to collect data on co-morbid disorders. However, it was decided that an online survey promoted through problem gambling counselling agencies throughout Australia was a better option (quicker, cheaper and greater anonymity for participants).

The original online data set contained 423 questionnaire attempts. However, a large proportion of these (67 or 16%) did not continue with the questionnaire after reading the online information sheet. Furthermore, there were 53 participants who indicated that they had not ever received treatment for their gambling and they were discontinued from the study. This left a sample size of 303, which was further reduced to 267 after data screening. The major criterion for data screening was the extent of missing data for each participant.

From the 267 participants that remained all provided data related to their gambling, depression, anxiety, alcohol and nicotine use. However, three of these 267 did not attempt the items related to drug use or the impulsivity facets. There were a further four participants who provided responses for the drug use questions, but not the impulsivity facets. Hence, the final sample size of 267 contained 260 fully completed questionnaires and 7 mostly completed questionnaires.

It should be noted that of the 36 participants removed during data screening the majority had exited the questionnaire early. For example, 20 of these did not continue past the depression questions (the first co-morbid disorder question). It is also worth noting that participants who discontinued early (either at the information sheet stage or during the questionnaire) may have opted for a telephone interview due to computer problems or personal preferences. Hence, the drop-out rate may not be as high as it appears and, overall, there were 58 of the 267 who completed the questionnaire via telephone interview.

4.1 Descriptive information

4.1.1 Gender, age and location

Of the 267 participants there were 144 men (54%) and 123 women. Participant age was measured in years and was normally distributed. The mean age was 44.33 years (SD = 13.79) and the ages ranged from 18 to 82 years. The women in the sample were older than the men with the mean ages being 48.72 and 40.58 years respectively.

Participants provided a postcode for their usual residential address and from these their state or territory was determined. There were 112 from New South Wales (42%), 102 from Victoria (38%), and 29 from Queensland (11%). These were the states in which most recruitment was targeted. There were also 11 from South Australia, 6 from Western Australia, 4 from Tasmania, 1 from the Northern Territory and 2 participants did not provide their postcode.

4.1.2 Problem gambling behaviour

All of the 267 participants indicated that they had sought help for problems related to their gambling. They were then asked to indicate the age they were when they first experienced these problems, the one main type of gambling associated with the problems and also to score the Problem Gambling Severity Index (PGSI) for that period of their life.

Age when first experienced difficulties with gambling

Participants were provided with a brief definition and explanation of problem gambling and asked the age they were when they first experienced difficulties with their gambling. The explanation from the questionnaire is copied below and is an expanded version of that developed by Neal, Delfabbro and O'Neil (2005).

Problem gambling is characterised by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community. These adverse consequences may include frequent financial problems, health problems such as stress and anxiety, or relationship issues. Thinking about this definition, at what age were you (in years) when you first experienced difficulties with your gambling?

The distribution for age when first experienced gambling problems was slightly positively skewed, but the mean and standard deviation were deemed to be the best measures of central tendency for this variable. The mean for both genders was 31.80

years (SD = 12.91), with men reporting difficulties with gambling occurring earlier (M = 26.64 years, SD = 10.17) than for women (M = 37.84, SD = 13.19). It was only the men's distribution that was slightly positively skewed and their median was 23 years (min.= 12, max. = 64).

Main form of gambling associated with problems

Table 4-1 presents frequency figures for the main form of gambling associated with participants' first experience of problem gambling.

Table 4-1 - Main form of gambling associated with first problem gambling experience

Form	Men	Women	Combined
EGMs	76 (53%)	111 (90%)	187 (70%)
Racing (Horse/hounds)	44 (31%)	2 (2%)	46 (24%)
Casino games	12 (8.3%)	5 (4%)	17 (7%)
Sports betting	6 (4%)	1 (1%)	7 (3%)
Lotto/Powerball	3 (2%)	1 (1%)	4 (2%)
Lottery tickets	1 (1%)	2 (2%)	3 (1%)
Keno	1 (1%)	0	1 (< 1%)
Share market	1 (1%)	0	1 (< 1%)
Missing	0	1 (1%)	1 (< 1%)
Total	144	123	267

Overall, both men and women indicated that EGMs were the form of gambling associated with their initial gambling related problems. However, for men this figure was much lower than for women and for men the number who cited 'racing' was much higher than for women.

4.1.2.1 PGSI classification

Following the question regarding the age of onset for gambling problems, participants were then asked to complete the PGSI in relation to that time in their life when they first experienced difficulties with gambling. The primary purpose of this section was to provide an estimate of the magnitude of the problem at the time and to also check that

the participants understanding of the disorder matched that of a standardised measurement tool. Table 4-2 presents the results for men and women across the four PGSI categories.

Table 4-2 - PGSI scores by gender

PGSI Score	Men	Women	Total
Non-problem	0	0	0
Low risk	0	0	0
Moderate risk	4 (3%)	7 (6%)	11 (4%)
Problem	140 (97%)	116 (94%)	256 (96%)
Total	144	123	267

Given their status as active treatment seekers it is unsurprising that all participants scored in the top two categories of the PGSI with almost all in the Problem Gambling category.

4.1.3 Mental health

The same procedure as that used for problem gambling was followed for the potential co-morbid disorders. Participants were presented with a definition of the disorder and asked how strongly they agreed or disagreed with the statement that they had experienced the disorder during their lifetime. If they indicated some agreement they were then asked what age they were when they first experienced the disorder and were then asked to complete a scale measuring the disorder. Of the five disorders (depression, anxiety, alcohol abuse, nicotine dependence, drug abuse) there were only 4 of the 267 (1%) who reported never having one of these other disorders.

Depression

Participants were presented with the following information about depression:

A depressive disorder is characterised by persistent low mood, problems functioning with everyday activities and a reluctance to participate in activities that were once enjoyable. Other symptoms of depression may include feeling down or sad for an extended period of time and feelings of worthlessness and hopelessness.

They were then asked:

Thinking about this definition, how strongly would you agree that you have experienced a depressive disorder during your lifetime?

*Not all
Somewhat Agree
Strongly Agree*

There were 20 (8%) participants who indicated “not at all”, 67 (25%) “somewhat agree” and 180 (67%) “strongly agree”. The participants from the last two categories were then asked at what age (in years) did they first experience a depressive disorder and were then asked to complete the seven-item depression subscale of the DASS21 for that time in their life.

For the 247 participants who indicated having experienced a depressive disorder at some time their life there were two participants who did not provide an associated age. For the 245 others, their mean age was 28.86 years (SD = 12.55). There was some slight positive skewness in this distribution and the median age was 25 years (min = 4, max = 75). There was very little gender difference in age with the 113 women averaging 29.54 years (SD = 13.94) and the 132 men averaging 28.27 years (SD=11.25).

Scores from the depression facet of the DASS21 were totalled and categorised according to the DASS manual (Lovibond & Lovibond, 1995). However, an important point of difference is that the DASS classification was based on a normative sample and a ‘past week’ time frame rather than the ‘past 12 months’ as was used in the current study. Table 4-3 presents the frequencies for each category and the columns represent the level with which the participants had agreed with the statement regarding having experienced depression at some time during their lifetime.

Table 4-3 - Frequency and severity of first onset of depression

Severity	Somewhat Agree	Strongly Agree	Total
Normal	16 (24%)	7 (4%)	23 (9%)
Mild	8 (12%)	5 (3%)	13 (5%)
Moderate	27 (40%)	34 (19%)	61 (25%)
Severe	8 (12%)	33 (18%)	41 (17%)
Extremely Severe	8 (12%)	101 (56%)	109 (44%)
Total	67	180	247

It can be seen that there were 23 participants (9%) who agreed (either somewhat or strongly) that they had experienced depression at some time, but were categorised as having a 'normal' level of depression at that time using the DASS categorisation. The majority of these were participants who had only "somewhat agreed" with the statement and whilst this does not discount the suggestion that they had a depressive disorder, it does raise some doubts about the participants being able to correctly identify the disorder retrospectively from the definition provided. Nonetheless, around 90% of those in agreement scored above 'normal' levels for depression.

Anxiety

The same procedure was followed for anxiety as it was for depression. A definition was first provided that read:

Anxiety disorders are characterised by persistent feelings of panic, worry or fear along with tension. This can occur for no apparent reason and can continue long after a stressful situation has passed. Other symptoms of anxiety may include experiencing breathing difficulties, being aware of heart action in the absence of physical exertion, trembling, dryness of mouth and feeling scared for no good reason.

Of the 267 participants, there were 50 (19%) who indicated "not at all", 85 (32%) responded "somewhat agree" and 132 (49%) responded "strongly agree". The participants from the last two categories were then asked at what age (in years) they first experienced an anxiety disorder. There were six participants who did not provide an age and the distribution for the remaining 211 was again slightly positively skewed. The mean age for first onset of anxiety was 29.52 years (SD = 13.12), with the median = 25 years (min = 5, max = 75). The mean age for women (N=98) was 30.97 (SD = 14.22) and for the 113 men was 28.26 (SD = 12.00).

Participants then completed the seven-item anxiety subscale of the DASS21 for the period in their life when they first felt they had an anxiety disorder. Table 4-4 displays the frequencies for 217 participants in each of the anxiety categories, according to Lovibond and Lovibond (1995). Again, the normative data is based on the past week timeframe.

Table 4-4 - Frequency and severity of first onset of anxiety

	Somewhat Agree	Strongly Agree	Total
Normal	19 (22%)	3 (2%)	22 (10%)
Mild	8 (9%)	4 (3%)	12 (6%)
Moderate	29 (34%)	22 (17%)	51 (24%)
Severe	10 (12%)	22 (17%)	32 (15%)
Extremely Severe	19 (22%)	81 (61%)	100 (46%)
Total	85	132	217

Overall, the figures in Table4-4 have a similar pattern to the depression table. There were 22 participants who indicated that they had an anxiety disorder at some time in their life but scored in the normal range on the anxiety subscale of the DASS21. There were 23 who followed this pattern for depression. To ensure there was not a response bias occurring with some participants, closer inspection of the data revealed that only 5 of these 22 participants were also in the ‘normal’ category for depression despite indicating that they had experienced a depressive disorder. Overall, it would appear that around 90% of participants who indicated some problems with depression and anxiety in the past were registering mild to extremely severe scores on DASS21 when used retrospectively.

Alcohol abuse

The definition for alcohol abuse was based on the substance related disorders category from the DSM-IV and the Alcohol Use Disorders Identification Test (AUDIT).

An alcohol use disorder is characterised by tolerance to the effect of alcohol and also withdrawal symptoms when use is reduced or stopped. It may also include repeated use of alcohol despite recurrent adverse consequences (e.g. failing to fulfil obligations, relationship issues). Other symptoms of an alcohol use disorder may include repeated unsuccessful efforts to stop or lessen the alcohol use, a need for alcohol first thing after waking and continued use of alcohol despite negative health effects (physical or psychological).

From this definition the majority of participants 172 (64%) did not agree that this disorder had applied to them at any time during their life. There were 49 (18%) who “somewhat agreed” that it applied to them and 46 (17%) who responded “strongly agree”. The 95 participants from the last two categories were all able to provide an age for when they first experienced an alcohol use disorder and the distribution was again

positively skewed. The mean age was 25 years (SD = 10.29) and the median was 22 (min = 11, max = 69). There was almost twice as many men (61) to women (34) in the sample and their mean age of onset was 22.87 (SD = 6.86) and 28.82 (SD = 13.87) respectively.

Table 4-5 - Frequency and severity of alcohol use disorder at time of first onset

Alcohol Use Category	Somewhat Agree	Strongly Agree	Total
Low risk	1 (2%)	0	1 (1%)
Moderate risk	12 (25%)	2 (4%)	14 (15%)
High risk	12 (25%)	4 (9%)	16 (17%)
Harmful use	24 (49%)	40 (87%)	64 (67%)
Total	49	46	95

These 95 participants completed the 10 item AUDIT in relation to that time in their life when they first experienced an alcohol use disorder. Generally the AUDIT items are framed within the past 12 months and some slight modifications were undertaken to items 9 and 10 to suit the purposes of the current study. Table 4-5 displays the categorisation of the participants' scores according to the AUDIT guidelines.

The AUDIT guidelines (Babor, Higgins-Biddle, Saunders, Monteiro, 2001) suggest intervention for participants scoring in the moderate risk category or higher. All participants, except one, scored in these categories and this suggests that there was good general agreement between the participant's identification of an alcohol use disorder, based on the definition, and the retrospective application of a standardised instrument designed to measure alcohol use disorder.

4.1.4 Nicotine dependence

Participants were presented with a definition for nicotine dependence which was based on the definition for alcohol with changes made based on the Fagerstrom Test for Nicotine Dependence (FTND) (Heatherton, Kozlowski, Frecker & Fagerstrom, 1991). The definition read:

Nicotine dependence is characterised by tolerance to the effect of nicotine and also withdrawal symptoms when use is reduced or stopped. For most people, smoking cigarettes is the main source of nicotine. Other symptoms of nicotine dependence may include repeated unsuccessful

efforts to stop or lessen the use of nicotine, a need for a cigarette first thing after waking and continued use despite negative health effects (physical or psychological).

From this definition there were 123 (46%) participants who did not agree that nicotine dependence had applied to them at any time during their life. There were 29 (11%) who “somewhat agreed” that it applied to them and 115 (43%) who responded “strongly agree”. Of the 144 from the last two categories, 139 were able to provide an age for when they first experienced nicotine dependence and this distribution was positively skewed. However, the mean and median ages were very similar with the mean = 19.75 years (SD = 6.67) and the median = 18 years (min = 11, max = 45). Gender was about evenly split with 65 women and 74 men and their mean age of onset for nicotine dependence was 18.88 years (SD = 6.45) for women and 20.51 years (SD = 6.80) for men.

There were 143 participants who completed the six-item FTND. Table 4-6 displays the categorisation of the participant’s scores according to the recommendations of Fagerstrom, Heatherton & Kozlowski (1991). However, other categorisations have been used in previous research which is slightly different to this (e.g., combining the Very low and Low categories).

Table 4-6 - Frequency and severity of nicotine dependence at time of first onset

Nicotine Dependence	Somewhat Agree	Strongly Agree	Total
No Dependence	3 (11%)	4 (4%)	7 (5%)
Very Low Dependence	8 (29%)	5 (4%)	13 (9%)
Low Dependence	9 (32%)	17 (15%)	26 (18%)
Medium Dependence	3 (11%)	17 (15%)	20 (14%)
High Dependence	3 (11%)	36 (31%)	39 (27%)
Very High Dependence	2 (7%)	36 (31%)	38 (27%)
Total	28	115	143

For the current sample, it would appear that of the 143 participants who self-reported having a nicotine dependence there was 5% who did not have any dependence according to the FTND categorisation. These participants were smoking 10 or less cigarettes per day but did not score on any of the other five items of the FTND. The

largest groups were the High and Very High dependence categories which comprised 54% of the nicotine dependent sample.

Drug abuse

The definition for drug abuse was worded in a similar manner to that of alcohol abuse and nicotine dependence with changes based on the DAST10 items. It was stipulated throughout this section that drugs referred to substances other than alcohol or nicotine and may include legal or illegal substances. The opening statement read:

A substance use disorder is characterised by tolerance to the effect of the substance and also withdrawal symptoms when use is reduced or stopped. It may also include repeated use of the substance despite recurrent adverse consequences (e.g., failing to fulfil obligations, relationship problems). Other symptoms of a substance use disorder may include repeated unsuccessful efforts to stop or lessen the substance use, a need for the substance first thing after waking, and continued substance use despite negative health effect (physical or psychological).

There were 3 (1%) participants who discontinued the questionnaire at this point and of the 264 others, 191 (72%) responded 'not at all' when asked if they had experienced a substance use disorder during their lifetime. There were 30 (11%) and 43 (16%) who "somewhat agreed" or "strongly agreed" respectively that they had experienced a substance use disorder. Of these 73, there were 72 who provided an age for when they first experienced a substance use disorder. The distribution for age was positively skewed and yielded a mean = 23 years (SD = 8.95) and a median = 20 years (min = 2, max = 59). For women, the mean age was slightly higher (24.70 years, SD = 11.91) than men (22.00, SD = 6.52).

All 73 participants completed the ten-item Drug Abuse Screening Test (DAST-10, Skinner, 1982). Skinner (1982) suggested that scores of three or greater reflect the likelihood of a drug use disorder. However, other categorisations exist for the higher scoring participants to reflect the continuum on which drug abuse lies (<http://www.druglibrary.stir.ac.uk/instrument.php>). Participants were classified according to these and it should be noted that a score of 3 would place the participant in the 'moderate' category.

Table 4-7 - Frequency and severity of drug abuse at time of first onset

Drug abuse	Somewhat Agree	Strongly Agree	Total
No use/problems	0	0	0
Low	6 (20%)	2 (5%)	8 (11%)
Moderate	18 (60%)	12 (28%)	30 (41%)
Substantial	5 (17%)	16 (37%)	21 (29%)
Severe	1 (3%)	13 (30%)	14 (19%)
Total	30	43	73

As shown in Table 4-7 there were 8 participants who were classified as having low level problems related to drug abuse. This category is for participants who scored less than three and whilst not generally considered as having a problem, the recommended action for practitioners is to monitor these people and reassess at a later date. Hence, it would appear that there was generally good agreement between participants understanding of the definition of substance use disorder and that measured by the DAST10.

Impulsivity facets

For the four measures of impulsivity (negative urgency, (lack of) premeditation, sensation seeking and positive urgency) there is no normative data or suggested classifications available. These scales are relatively new and whilst the UPPS-P (Cyders et al., 2007; Whiteside & Lynam, 1999) has shown good reliability and validity, its use has been limited to research rather than screening or to assist diagnosis. There were 260 participants who completed the four scales and this cohort comprised 119 women and 141 men. Table 4-8 provides the means and standard deviations for each facet with the possible range of scores indicated in brackets after the name of each facet of impulsivity. Gender is used for comparative purposes with this table.

Table 4-8 - Mean and standard deviation of each impulsivity facet by gender

Impulsivity Facet	Men	Women	Combined
Premeditation (11-44)	25.11 (5.21)	25.06 (4.97)	25.09 (5.09)
Negative Urgency (12-48)	34.93 (6.02)	35.20 (5.09)	35.05 (5.60)
Sensation seeking (12-48)	30.99 (6.71)	26.54 (6.50)	28.95 (6.96)
Positive Urgency (14-56)	36.51 (8.31)	34.13 (8.48)	35.42 (8.45)

The major difference between men and women was on the sensation seeking scale with men scoring just over four points higher than women.

4.1.5 Age of onset summary

Table 4-9 provides a summary of the participants mean age when they first experienced problem gambling or one of the potential co-morbid disorders.

Table 4-9 - Mean age of onset summary

Disorder	Men	Women	Combined
Gambling	26.64 (10.17) N=144	37.84 (13.19) N=123	31.80 (12.91) N=267
Depression	28.27 (11.25) N=132	29.54 (13.94) N=113	28.86 (12.55) N=245
Anxiety	28.26 (12.00) N=113	30.97 (14.22) N=98	29.52 (13.12) N=211
Alcohol	22.87 (6.86) N=61	28.82 (13.87) N=34	25.00 (10.29) N=95
Nicotine	20.51 (6.80) N=74	18.88 (6.54) N=65	19.75 (6.67) N=139
Other Drugs	22.00 (6.52) N=45	24.70 (11.91) N=27	23.00 (8.95) N=72

Examination of the 'Combined' gender column suggests that the first experience of problem gambling occurred after the first experience of all other disorders. This trend is also evident in the column for women. However, for men both depression and anxiety were first reported as occurring, on average, after problem gambling (and after all other disorders). The key point of differentiation appears to be the late onset of problem gambling for women. Men generally reported the first onset of each disorder as some time during their twenties, however, women ranged from 18.88 years for nicotine to 37.84 years for problem gambling. This gender difference needs to be considered when determining the temporal sequence of problem gambling with other disorders.

4.2 Temporal sequencing analysis

4.2.1 Temporal sequencing

The age of onset means displayed above provide some indication of the temporal sequencing between disorders. These data suggest a gender effect but do not identify the temporal sequence at the level of the individual. In order to better reveal this, categories were created that identified the age of experiencing a disorder as either before, in the same year, or after, the first experience of problem gambling for each individual participant. This was created by using the age in years provided by

participants for the first onset of any disorder experienced and relating it back to the age when problem gambling was first experienced.

This created two factors to be examined in relation to temporal sequencing. The first was the temporal sequence with three levels (before/same year/after) and the second was gender (male/female). The major dependent variable was the frequency or counts of participants who fell into each group. This design would allow the analysis to reveal if there was a significant difference in the number of men and women who experience the first onset of a disorder as either before, in the same year or after their first onset of problem gambling.

The frequency data for each category is presented in the following tables. After each table a chi-square analysis is then undertaken to determine the relationship, if any, between gender and temporal sequencing. For most disorders, this is a 2 x 3 chi-square to reflect the factors of gender and sequence. However, for some disorders this became a 2 x 2 chi-square as cell sizes for the same year category were too small.

The chi-square statistic is augmented with a Cramer's *V* coefficient as a measure of the strength of the association between gender and temporal sequencing. Furthermore, the adjusted standardised residuals are reported to identify cells with significant differences between the observed and expected frequencies. If the adjusted standardised residual ≥ 1.96 it achieves statistical significance at the $p \leq .05$ level. A residual ≥ 2.58 would achieve significance at the $p \leq .01$ level.

Following this is an analysis of the mean number of years between the first onset of problem gambling and the first onset of the other disorder. Again, the two factors of gender and sequence were used, however sequence now only had two levels (before/after) as the same year category was a constant (i.e. a zero as the two disorders occurred in the same year). This analysis would reveal if there was a significant difference between men and women in the mean number of years between the first onset of a disorder and the first onset of problem gambling.

The preferred analysis of the mean number of years measure was a 2 x 2 MANOVA with gender and sequence as independent variables and the mean number of years for the five disorders as the multivariate dependent variables. However, most of the disorders had small and unequal cell sizes and there was also consistent violation of the assumption of homogeneity of variance. This is due to the natural groups' design of the study where the levels of the factors could not be manipulated. To address this,

where possible, the data were analysed with a 2 x 2 ANOVA for each disorder or in some cases it was reduced to separate independent samples t-tests. For all analyses, an α of .05 was used to determine significance, however, it should be noted that the replacement of the omnibus MANOVA test with several univariate tests increases the possibility of a significant result occurring by chance (type 1 error). Along with the five chi-square analyses there were 10 inferential statistical procedures undertaken in this section alone. A Bonferroni correction would suggest that an $\alpha \leq .005$ should be utilised. Actual p values are provided to assist the reader in determining an acceptable alpha level and the spuriousness of the result.

Depression

Table 4-10 presents the frequencies and percentage per gender for the sample in relation to the sequencing of the first occurrence of problem gambling with the first occurrence of depression.

Table 4-10 - Problem gambling and depression frequencies

Sequence	Men	Women	Total
PG before depression	63(48%)	24 (21%)	87 (36%)
PG same year depression	30 (23%)	20 (18%)	50 (20%)
PG after depression	39 (30%)	69 (61%)	108 (44%)
Total	132	113	245

This is given for the 245 participants that reported experiencing a depressive disorder and could also recall their age when this was first experienced. Of the 267 participants there were 20 (8%) who reported never experiencing depression and of the 247 remaining, there were 2 who could not provide an age for the first onset of depression.

From Table 4-10 it is apparent that there is a slightly larger proportion of both genders reporting that the first onset of problem gambling occurred after the first onset of depression (44%) compared to the before depression group (36%) and both these groups were much larger than the 'same year' category (20%). However, there did appear to be a gender effect with the largest group for men being the 'problem gambling before depression' group (48%) and the largest group for women being the 'problem gambling after depression' group (61%). This difference between genders

was not apparent for the 'same year' category with around 20% of both samples reporting that their problem gambling and depression occurred in the same year.

To further examine the relationship between gender and the temporal sequencing of problem gambling with depression, a 2 x 3 chi-square analysis was undertaken with gender (male/female) and temporal sequencing (before/same year/after). The assumptions of the chi-square analysis were met (independence, expected frequencies > 5) and the results revealed a $\chi^2 (2, N=245) = 26.50$ ($p < .001$), Cramers $V = .33$. This indicates that there was a significant, weak to moderate relationship between gender and the temporal sequencing of problem gambling and depression. Inspection of adjusted standardised residuals for each cell identified that the cells where the observed frequencies significantly differed from the expected frequencies were the 'before' cells (adj. SR = ± 4.3) and 'after' cells (± 5.0) and both these were significant at the .01 level (these cells are shaded grey in Table 4-10 to assist the reader). The figures for the 'same year' category cells was ± 1 .

To further assist the interpretation of these data odds ratios were calculated. The ratio of problem gambling first occurring before depression compared to occurring after depression was 4.63 times greater for men than for women. Similarly, this could be interpreted as the ratio of problem gambling after depression being 4.63 times greater for women compared to men.

To provide further insight into gender differences a 2 x 2 factorial ANOVA was undertaken with gender (male/female) being one factor and sequence the other (before/after). The dependent variable was the number of years between the first onset of problem gambling and the first onset of depression. There were no significant outliers within any of the four cells ($p > .001$). However, there was significant skewness for the two male cells ($p < .001$). Furthermore, the assumption of homogeneity of variance was not met and this was problematic given the large discrepancy in sample sizes across the four cells (e.g., there were three times as many women in the PG after depression group compared to the PG before depression group). Transformation of scores was considered (Field, 2000) but it was deemed more important to keep the measure of years in that form to assist interpretability of the results. A 2 x 2 ANOVA was undertaken using weighted means (to compensate for sample size imbalance) and an adjusted F statistic and *df* (due to heterogeneity of variance) for the main effects were calculated. The Games-Howell post-hoc test was used to assess the interaction effect as it is recommended by Field (2000) when heterogeneity of variance is

encountered with unequal sample sizes. Results indicated a significant main effect for sequence, $F(1, 183.94) = 28.12, p < .001$, a significant main effect for gender, $F(1, 182.24) = 17.33, p < .001$ and a significant interaction effect, $F(1, 191) = 5.36, p = .02$. Table 4-11 displays the weighted means and standard deviations for each cell.

Table 4-11 - Problem gambling and depression means

Sequence	Men	Women	Total
PG before depression	6.73 (7.10)	3.96 (2.81)	5.97 (6.33)
PG after depression	7.05 (6.15)	15.07 (10.50)	12.18 (9.92)
Total	6.85 (6.72)	12.20 (10.36)	9.41 (9.03)

Examination of the interaction effect revealed a significant difference between men and women in the PG after depression group ($p < .001$). Although all participants in this group reported their first onset of problem gambling occurring after their first onset of depression, for women it was, on average, 8.02 years later than for men. This pattern was reversed for the PG before depression group with men reporting their first onset of problem gambling occurring, on average, 6.73 years before their first onset of depression compared to the women's mean of 3.96 years. However, this difference failed to achieve significance ($p = .051$).

Overall, the results of the chi-square and ANOVA suggest that the temporal sequencing of problem gambling with depression is different for men and women. For men, it appears that the first onset of problem gambling is more likely to occur before the first onset of depression and for women it appears that problem gambling is more likely to occur after depression. Furthermore, even when the first onset of problem gambling does occur after the first onset of depression for both genders, it is occurring at a much later stage for women than for men.

Anxiety

There were 50 (19%) of the 267 participants who reported never experiencing anxiety during their lifetime. Of the 217 remaining, there were 6 who could not provide an age for the first onset of anxiety, leaving 211 in the three sequencing categories.

Table 4-12 - Problem gambling and anxiety frequencies

Sequence	Men	Women	Total
PG before anxiety	55 (49%)	32 (33%)	87 (41%)
PG same year anxiety	23 (20%)	16 (16%)	39 (19%)
PG after anxiety	35 (31%)	50 (51%)	85 (40%)
Total	113	98	211

From Table 4-12 it appears that the proportion of participants reporting problem gambling occurring before anxiety was almost identical to the proportion reporting problem gambling occurring after anxiety (41% vs. 40%). However, the split for men and women shows a possible gender effect and this appears similar to the result for depression. Also similar to depression is the percentage of respondents reporting problem gambling occurring in the same year as an anxiety disorder (around 20%).

A 2 x 3 chi-square analysis was undertaken with gender (male/female) and temporal sequencing (before/same year/after) for the anxiety data. The assumptions of the chi-square analysis were met (independence, expected frequencies > 5) and the results revealed a $\chi^2 (2, N=211) = 8.96 (p = .01)$, Cramers $V = .21$. This indicates that there was a weak but statistically significant relationship between gender and the temporal sequencing of problem gambling and anxiety. Inspection of adjusted standardised residuals for each cell confirmed a similar pattern as for depression. The residuals for the 'before' cells was $\pm 2.4 (p < .05)$ and $\pm 3 (p < .01)$ for the after cells. The figure for the 'same year' category was ± 0.8 .

The ratio of problem gambling first occurring before anxiety compared to occurring after anxiety was 2.45 times greater for men than for women. Conversely, the odds ratio was 2.45 for women experiencing problem gambling after an anxiety disorder compared to men.

As with the depression variable, a 2 x 2 factorial ANOVA was undertaken with gender and anxiety as factors and the number of years between the first onset of problem gambling and the first onset of anxiety as the dependent variable. There was one significant outlier for the men's "PG before anxiety' group which was a raw score of 40 years. This was reduced to one more than the next highest (i.e. 31) and no further outliers were detected (Tabachnick & Fidell, 1996). However, there was also significant positive skewness in three of the four cells, along with an imbalance in sample sizes across the cells and a failure to meet the assumption of homogeneity of variance. Hence, the use of weighted means and an adjusted F statistic was undertaken in a

manner identical to that used for the depression variable. Results indicated a significant main effect for sequence, $F(1, 154.19) = 22.71, p < .001$, a significant main effect for gender, $F(1, 164.75) = 13.86, p < .001$ and a significant interaction effect, $F(1, 168) = 16.86, p < .001$. Table 4-13 displays the weighted means and standard deviations for each cell.

Table 4-13 - Problem gambling and anxiety means

Sequence	Men	Women	Total
PG before anxiety	7.51 (8.03)	5.34 (5.11)	6.71 (7.14)
PG after anxiety	7.03 (5.16)	17.04 (10.05)	12.92 (9.71)
Total	5.83 (6.93)	10.44 (10.41)	9.78 (9.04)

As indicated by the four cell means, a similar pattern to depression was found for anxiety. The mean number of years between the first onset of disorders was greater for men in the PG before anxiety group, yet smaller in the PG after anxiety group. The Games-Howell post hoc test indicated that the gender means were significantly different for the PG after anxiety groups ($p < .001$) but not for the PG before anxiety group ($p = .42$).

Overall, these results suggest that the temporal sequencing of the first onset of problem gambling with the first onset of anxiety was very similar to depression. The sequence was different for men and women, with men more likely to report the first experience of problem gambling occurring before the first experience of an anxiety disorder. For women, the first experience of problem gambling tends to occur after the first experience of an anxiety disorder. Similarly, for both men and women who report that their first onset of problem gambling occurred before their first onset of anxiety, the mean number of years between disorders was not significantly different. However, for those who reported that the first onset of problem gambling occurred after the first onset of anxiety, the mean number of years between disorders was significantly greater for women compared to men. It would appear that a key feature in the temporal sequencing of disorders with problem gambling is the very late onset of problem gambling for women compared to men.

Alcohol abuse

Unlike depression and anxiety, the majority of participants (172 or 64%) reported never experiencing an alcohol use disorder during their lifetime. Of the 95 remaining all were able to provide the relevant age of onset. Although men comprised 54% of the original sample of 267, they were slightly over-represented in the alcohol use disorder category, comprising 64% (n=61) of the 95 participants as shown in Table 4-14.

Table 4-14 - Problem gambling and alcohol abuse frequencies

Sequence	Men	Women	Total
PG before alcohol	23 (38%)	6 (18%)	29 (31%)
PG same year alcohol	7 (12%)	1 (3%)	8 (8%)
PG after alcohol	31 (51%)	27 (79%)	58 (61%)
Total	61	34	95

The scores in the last column suggest that the majority of participants (61%) who indicated a previous problem with alcohol reported that the initial onset of problem gambling occurred at an age after problems with alcohol commenced. There were exactly twice as many reporting this across the sample, compared to the problem gambling before alcohol group, however this was dependent upon gender with over four times as many women following this pattern compared to only 1.4 times as many men.

A 2 x 3 chi-square analysis was undertaken with gender (male/female) and temporal sequencing (before/same year/after) for the alcohol abuse data. However, the assumptions of the chi-square analysis were not met with an expected frequency count for women in the 'PG same year alcohol' cell being less than 5 (i.e. 2.9). This category was removed from the analysis with the effect of increasing the percentage of men in the 'PG before alcohol' category to 43% and the women to just over 18%. For the 'PG after alcohol' category the percentages for men and women increased to 57% and 82% respectively. The subsequent 2 x 2 chi-square no longer required the calculation of adjusted standardised residual and also prompted the use of the Phi coefficient as the appropriate measure of association over Cramer's V (Field, 2000). The analysis revealed a $\chi^2 (1, N=87) = 5.49$ ($p = .02$), $\Phi = .25$. Again a weak, but statistically significant relationship was found between gender and temporal sequencing of problem gambling with a co-morbid disorder. The ratio of problem gambling first occurring after

an alcohol use disorder compared to before was 3.36 times greater for women than for men.

As with depression and anxiety, the 2 x 2 factorial ANOVA was hindered by the failure to meet the assumption of homogeneity of variance and unequal cell sizes. However, there was the additional problem of a very small sample size for one of the cells (women indicating PG before alcohol, n=6). This prohibited any interaction analysis and instead, based on the results for depression and anxiety an independent samples t-test was performed on the 'PG after alcohol' group testing for a gender difference in mean number of years between disorders. Sample sizes were reasonably large and equal (both around n=30), there were no outliers and the assumption of homogeneity of variance was met. Results indicated a significant difference between gender means, $t(56) = 2.63, p = .011$ with the mean number of years between disorders for women (13.30) being significantly greater than for men (7.10).

Table 4-15 - Problem gambling and alcohol abuse means

Sequence	Men	Women	Total
PG before alcohol	4.17 (4.24)	9.33 (11.13)	5.24 (6.39)
PG after alcohol	7.10 (7.66)	13.30 (10.24)	9.98 (9.41)
Total	5.18 (6.43)	12.21 (10.41)	7.69 (8.71)

In summary, the majority of problem gamblers (64%) did not report experiencing an alcohol use disorder at any time in their life. Of those who did the general pattern was for problem gambling to be reported as first occurring after alcohol problems. However, this was a significantly stronger relationship for women and women also reported a significantly longer duration between problem gambling and alcohol abuse.

Nicotine

Just under half of the sample (46% or 123) reported never having nicotine dependence. Of the remaining 144 there were 5 who could not recall the age when they first experienced nicotine dependence. This left a sample of 139 for the temporal sequencing analysis.

Table 4-16 - Problem gambling and nicotine dependence frequencies

Sequence	Men	Women	Total
PG before nicotine	17 (23%)	4 (6%)	21 (15%)
PG same year nicotine	8 (11%)	1 (2%)	9 (7%)
PG after nicotine	49 (66%)	60 (92%)	109 (78%)
Total	74	65	139

From the Total column there appears to be a far greater proportion of participants reporting the onset of problem gambling after nicotine dependence. Both men and women followed this pattern, but it is much stronger for women with 15 times as many in the 'after' category compared to 'before' whereas for men this was only 3 times greater.

Due to two cells in the proposed 2 x 3 chi-square having expected frequencies below 5 (both 'same year' cells) a 2 x 2 chi-square was undertaken using the other two categories for temporal sequencing (before/after). This resulted in minor changes to the percentages for women (6% and 94%) and increases for both the 'before' and 'after' rows for men to 26% and 74% respectively. The resulting $\chi^2 (1, N=130) = 9.13$ ($p = .003$), $\Phi = .27$ again indicated a weak, but statistically significant relationship. The ratio of problem gambling first occurring after nicotine dependence compared to before was 5.25 times greater for women than men.

As with alcohol a 2 x 2 ANOVA could not be undertaken due to a very small sample size in one of the cells (women indicating PG before nicotine, $n=4$). Instead, the same procedure as alcohol was undertaken with an independent samples t-test performed on the 'PG after nicotine' group.

Table 4-17 - Problem gambling and nicotine dependence means

Sequence	Men	Women	Total
PG before nicotine	4.12 (2.98)	3.25 (2.63)	3.95 (2.87)
PG after nicotine	8.57 (7.60)	21.22 (11.65)	15.53 (11.82)
Total	7.42 (6.98)	20.09 (12.11)	13.66 (11.69)

Assumptions were met and results revealed a $t(107) = 6.54$, $p < .001$. The mean number of years between the first onset of nicotine dependence and the first onset of

problem gambling was significantly greater for women (21.22 years) than for men (8.57 years).

Overall, the results suggest that the first experience of problem gambling tends to occur after the first occurrence of nicotine dependence, but this effect is significantly stronger for women than men. Also, for those who did experience problem gambling after nicotine dependence, the mean number of years between the onset of disorders is significantly greater for women than men.

Drug abuse

There were 3 (1%) participants who discontinued the questionnaire at this point and of the 264 others, 191 (72%) reported no drug abuse during their lifetime. Of the 73 (28%) who did, men were disproportionately represented comprising 63% of the drug abuse sample, despite only comprising 54% of the entire sample. There was one participant who did not provide an age of onset, thus leaving 72 in the final analysis.

Table 4-18 - Problem gambling and drug abuse frequencies

Sequence	Men	Women	Total
PG before drugs	15 (33%)	6 (22%)	21 (29%)
PG same year drugs	3 (7%)	4 (15%)	7 (10%)
PG after drugs	27 (60%)	17 (63%)	44 (61%)
Total	45	27	72

Table 4-18 shows, much like the result for nicotine, a far greater proportion of participants reporting the onset of problem gambling after drug abuse (61%). Both men and women followed this pattern, but it was slightly stronger for women with almost three times as many in the 'after' category compared to 'before' whereas for men this was just under twice as many.

Due to two cells having expected frequencies below 5 (both 'same year' cells) a 2 x 2 chi-square was undertaken using the other two categories for temporal sequencing (before/after). This resulted in cell percentages of 36% and 64% for men and 26% and 74% for women. The resulting $\chi^2 (1, N=65) = 0.630 (p = .43)$, $\Phi = .10$ indicated that although the distribution of frequencies was similar to depression, anxiety, alcohol abuse and nicotine dependence, there was no statistically significant association between gender and the temporal sequencing of problem gambling with drug abuse.

A one-way chi-square performed on the two total categories of 'before' and 'after' resulted in a $\chi^2 (1, N=65) = 8.14 (p = .004)$ indicating that a significantly greater proportion of participants than expected reported the first experience of problem gambling as occurring after the first occurrence of drug abuse. This pattern was irrespective of gender, which could not be claimed for the other disorders.

As with alcohol and nicotine a 2 x 2 ANOVA of the number of years variable could not be undertaken due to the small sample sizes in the interaction cells. Following from the alcohol and nicotine results, an independent samples t-test was conducted on the 'PG after drugs' group. Once again, a significant difference was found $t(42) = 3.64, p = .001$ between men and women. As shown in Table 4-19 the mean for women (16.82) was significantly larger than the mean for men (7.22).

Table 4-19 - Problem gambling and drug abuse means

Sequence	Men	Women	Total
PG before drugs	5.87 (5.00)	5.83 (3.97)	5.86 (4.63)
PG after drugs	7.22 (6.30)	16.82 (11.24)	10.93 (9.66)
Total	6.29 (5.89)	11.89 (11.26)	8.39 (8.68)

Overall, the results for temporal sequencing of the first onset of drug abuse and the first onset of problem gambling suggest no gender effect and that more participants were likely to experience problem gambling after a drug abuse problem than before. Also, women in the 'PG after drugs' category had a significantly longer time frame between disorders than for men in the same category.

4.2.2 Summary

Overall, the temporal sequencing of the first onset of problem gambling with the first onset of another disorder found similar results across all five disorders tested. The one consistent feature was that a different pattern emerged for men and women.

There were few participants who did not report experiencing depression (8%) or anxiety (19%) at some stage in their life. For men who experienced either mood disorder it appears that the first onset of problem gambling is more likely to occur before the first onset of depression or anxiety and for women it appears that problem gambling is more likely to occur after the first onset of depression or anxiety.

Furthermore, even when the first onset of problem gambling does occur after the first onset of depression or anxiety for both genders, it is occurring at a significantly much

later stage for women than for men. The odds ratio for the first onset of problem gambling occurring after depression and anxiety for women compared to men, was 4.63 and 2.45 respectively.

For the substance abuse disorders (alcohol, nicotine, drugs) a major difference from the mood disorders was the large proportion of problem gamblers who did not report experiencing any of these at any time in their life (64%, 46%, 72%). Also, very few reported it first occurring during the same year as the first occurrence of problem gambling. Of those who did indicate a problem with alcohol, nicotine or drugs, most reported experiencing it before the onset of problem gambling and for women, the effect was stronger with the odds ratio for alcohol = 3.36 and for nicotine = 5.25 when compared to men.

Although more of both genders reported problem gambling first occurring after the first occurrence of either alcohol abuse, nicotine dependence or drug abuse, this pattern was significantly stronger for women compared to men with the exception of drug abuse which failed to achieve significance. Furthermore, for the 'problem gambling after alcohol/nicotine/drug abuse' groups, the mean number of years between disorders was significantly greater for women than men.

4.3 Predictors of problem gambling severity

4.3.1 Evidence for predictors

The ability of the mental health variables assessed in this study to predict the severity of problem gambling at first onset is limited by the time frame utilised. Participants indicated the age of first onset for each disorder and there is no evidence to suggest that the severity of any disorder at first onset is a good predictor of the severity of problem gambling at first onset. For many participants there were many years between the first onset of disorders and it would be illogical to test these as predictors. However, impulsivity is considered a personality trait (a relatively more enduring characteristic of a person) and as such would develop prior to experiencing any gambling related problems. Impulsivity has also been implicated as a predictor of problem gambling in past research (Steel & Blaszczynski, 1997) and has also demonstrated a relationship to anti-social personality disorder and borderline personality disorder. Hence, the four impulsivity facets were tested as potential predictors of problem gambling.

4.3.2 Levels of impulsivity

The impulsivity facets measured in the current study were derived from the literature and included negative urgency (strong impulses under conditions of negative affect), lack of premeditation (a low tendency to think and reflect on consequences), sensation seeking (openness to exciting experiences) and positive urgency (strong impulses under conditions of positive affect). Initial analyses involved correlating these four facets with each other and with PGSI scores at first onset for men and women. The predictors were generally well correlated with each other, with the strongest being between negative urgency and positive urgency with an $r(139) = .69$ for men and an $r(117) = .62$ for women. Table 4-20 presents the bivariate correlations between predictors and the PGSI for both genders.

Table 4-20 - Impulsivity and PGSI correlations

	Negative Urgency	Premeditation	Sensation Seeking	Positive Urgency
Men PGSI (N=141)	.32**	.20*	.11	.33**
Women PGSI (N=119)	.26**	.02	-.15	.24**

* $p < .05$, ** $p < .01$

The two most salient relationships were between the PGSI and negative urgency and the PGSI and positive urgency. For both men and women a significant positive relationship was found suggesting that greater scores on either impulsivity facet corresponded to greater scores on the PGSI. A smaller significant positive relationships also existed with the PGSI and (lack of) premeditation for men with all other correlations failing to achieve significance at the $p \leq .05$ level.

To better determine the relationship between impulsivity and problem gambling, all four impulsivity facets were entered simultaneously into a regression model for men and women. For both genders the assumptions of this technique were met, including multivariate normality and homoscedasticity. As the focus was on identifying the best predictor of problem gambling scores, Table 4-21 presents the standardised regression coefficients.

Table 4-21 - Impulsivity and PGSI status regression results

	Negative Urgency	Premeditation	Sensation Seeking	Positive Urgency	AdjR ²
Men PGSI	.16	.05	-.03	.22	.11**
Women PGSI	.19	-.09	-.24*	.23*	.11**

*p < .05 ** p < .01

Comparing the coefficients from Table 4-20 and Table 4-21 shows that, for men, all predictors now failed to achieve significance. The bivariate correlations indicated that negative urgency, (lack of) premeditation and positive urgency were significantly related to problem gambling but these relationships became redundant when all facets were entered simultaneously. For women, both negative and positive urgency had significant bivariate correlation coefficients with problem gambling but when all variables were entered into the regression, positive urgency retained its significance and negative urgency did not. Also, sensation seeking became significant in the regression results.

The reduced coefficients for both negative and positive urgency may be attributed to overlapping variance between these variables. They were highly correlated with each other and the model was unable to assign explained variance in problem gambling to either of these predictors thereby generating smaller unique variance coefficients. The result for sensation seeking in the female sample suggests that one of the three other facets is acting as a suppressor variable. That is, one of the other impulsivity facets is removing variance in PGSI scores and this leads to a stronger relationship between sensation seeking and problem gambling. There is not a great suppressor variable effect as the sensation seeking coefficient only increased by .09.

The results for men and women do not provide any clear, easily interpretable results as to the best impulsivity predictors of problem gambling. On empirical grounds the inclusion of positive urgency may be responsible for the lack of clarity. This is a relatively new facet of impulsivity and as such does not have the empirical support that the other facets have. Furthermore the high correlation with negative urgency, a variable with much greater empirical support, may be responsible for weakening the regression result, particularly for men.

It has been argued that negative and positive urgency do not represent opposite ends of a single continuum but are two distinct impulsivity facets. However, the studies to support this are limited to Cyders et al. (2007) and Cyders and Smith (2008). The

studies undertaken utilised female dominated undergraduate students and female only alcohol abusers and the correlations between both facets was much lower than the current study (i.e. $r = .37$, Cyders et al., 2007).

Positive urgency is also the variable likely to have acted as a suppressor variable in the current study as previous studies have not found a suppressor variable with the other impulsivity facets. Both regressions were run again, excluding positive urgency and the results are presented in Table 4-22 below.

Table 4-22 - Impulsivity and PGSI status regression results without positive urgency

	Negative Urgency	Premeditation	Sensation Seeking	AdjR ²
Men PGSI	.29**	.07	.02	.09**
Women PGSI	.33**	-.06	-.19*	.09**

* $p < .05$, ** $p < .01$

The results of the regression without the inclusion of positive urgency provide a model that is aligned much more closely to that of past research. Negative urgency is the impulsivity facet that is the strongest predictor of the severity of problem gambling at first onset. That is, those participants more likely to behave impulsively under conditions of negative affect (e.g., depressed, anxious) tended to score higher on the PGSI than those who did not. The (lack of) premeditation variable failed to achieve significance for both men and women and does not appear to be an impulsivity facet that predicts problem gambling levels.

For women, sensation seeking was found to be negatively related to problem gambling in the model. The exclusion of positive urgency saw the strength of this relationship diminish somewhat, suggesting that positive urgency was indeed acting as the suppressor variable. The weak but significant negative relationship for sensation seeking suggests that it may act as a protective factor for the severity of problem gambling. The sensation seeking items were measuring the level of enjoyment for a range of risky activities. (e.g., seeking new experiences, enjoying fast paced sports, learning to fly a plane, going scuba diving) and it may simply be a willingness to engage in a range of activities that protects women from developing more severe levels of problem gambling. Of course why this does not protect men would also need to be explained, but it may have something to do with the problematic forms of gambling. Women in the sample almost universally stated that EGM's were the problem whereas men were more likely to include higher arousal forms of gambling activities such as

horse racing and sports betting along with EGM play. That is, the female sample was more homogeneous in this regard.

4.4 Summary of findings from problem gamblers in treatment

This stage of the study comprised an online survey of problem gamblers in treatment (N=267) in order to examine the temporal relationship between problem gambling and a range of co-morbid disorders in this population. Of the five disorders (depression, anxiety, alcohol abuse, nicotine dependence, drug abuse) there were only 4 of the 267 (1%) respondents who reported never having one of these other disorders. Age of onset of these disorders and PGSI scores were examined using a range of tests that revealed consistent differences between men and women in the sample.

Descriptive information revealed an 8 year mean age difference between men and women at the time of the survey (women = 49 years, men = 41 years). Men also reported their first onset of problem gambling as occurring at a much younger age than women (M=26.64 versus 37.84). Both men and women indicated that EGMs were the form of gambling associated with their initial gambling related problems however, for men this figure was much lower than for women and for men the number who cited 'racing' was much higher than for women. It is possible, however, that these gender differences would disappear if the analysis was confined to one gambling activity such as gaming machine use. This is a limitation of this component of the study. PGSI status at first onset was confirmed with 96 per cent classified as problem gamblers and 4 per cent moderate risk gamblers.

Overall, the temporal sequencing of the first onset of problem gambling with the first onset of another disorder found similar results across all five disorders tested. There were few participants who did not report experiencing depression (8%) or anxiety (19%) at some stage in their life. For men who experienced either mood disorders it appears that the first onset of problem gambling is more likely to occur before the first onset of depression or anxiety and for women it appears that problem gambling is more likely to occur after the first onset of depression or anxiety. Furthermore, even when the first onset of problem gambling does occur after the first onset of depression or anxiety for both genders, it is occurring at a significantly much later stage for women than for men.

Most problem gamblers did not report experiencing a substance abuse (alcohol, drugs) problem at any time (64%, 72%) although about half indicated nicotine dependence at

some stage in their life. Of those who did indicate a problem with alcohol, nicotine or drugs, most reported experiencing it before the onset of problem gambling and for women, the effect was stronger with the odds ratio for alcohol = 3.36 and for nicotine = 5.25 when compared to men. Also, the mean number of years between the onset of substance abuse and problem gambling was greater than for men.

The results for the impulsivity facets were less clear, however the removal of positive urgency did improve the predictive ability of the other facets. In particular, negative urgency was shown for both men and women to be a weak, but significant, predictor of the severity of the first onset of problem gambling.

Chapter 5 Time 1 of the National Telephone Survey

Stage 4 is Time 1 of the longitudinal component of the current project. A national telephone survey of regular gamblers was undertaken with the intent of providing a retrospective and prospective account of the temporal relationship between problem gambling and other co-occurring disorders. The focus of this chapter is the retrospective account with the prospective account being detailed in the following chapter (i.e. A Time 1 and Time 2 analysis). A total of 620 gamblers completed the questionnaire for Stage 4. This was essentially the same questionnaire as Stage 3, with a slightly different structure designed to be administered over the telephone (details are provided in the Methods section of this report). Recruitment was via random digit telephone dialling and administered by a market research company with experience in problem gambling surveys. Participants were required to be over 18 years of age and were initially required to gamble at least 52 times per year. However, due to a lower than anticipated response rate and a longer questionnaire, this was reduced to a minimum of 26 times per year to achieve the desired sample size. The market research reported that around 8% of initial calls were resulting in regular gamblers willing to participate. This had been estimated at 10%. They also reported great variance across locations with Tasmania non-metropolitan being as high as 16% and Darwin being 0%. With gambling participation levels recorded a call back procedure was implemented and this resulted in just under 25% of the final sample (n=153) who did not fit the original definition of regular gambler. Their frequency of gambling ranged from 50 times per year to 26 times per year.

5.1 Descriptive information

5.1.1 Gender, age and location

Of the 620 participants, 351 (57 per cent) were men and 269 (43 per cent) were women. All participants were asked their year of birth and their age was determined as of 2010. There were 45 participants who did not want to provide their year of birth and they were presented with age categories in 5 year intervals. The mid-point of these intervals was used to determine their age in years. The mean age of participants was 54.30 years (SD = 16.65) and ranged from 18 to 91 years. The women in the sample were slightly older than the men with a mean age of 56 years compared to 53 years.

The majority of participants were recruited from New South Wales (33 per cent), followed by Victoria (25 per cent), Queensland (16 per cent), South Australia (9 per

cent), Tasmania (7 per cent), Western Australia (4 per cent), Northern Territory (2 per cent) and the Australian Capital Territory (2 per cent).

5.1.2 Gambling behaviour

Gambling behaviour was measured using frequency and expenditure of gambling over the past 12 months across seven forms of gambling. These included Keno, poker machines/EGMs, horse and greyhound racing, sports events, casino games not on the internet, casino games on the internet and private gambling for money (e.g. cards, mah-jong).

All participants completed the Problem Gambling Severity Index and were also asked their age when they first gambled with money, their age when they started gambling regularly, and their age when they first felt they might have a problem with gambling (if applicable). If a problem with gambling was self-reported, participants were also asked about the form of gambling associated with the problem.

Frequency of gambling

Participants were asked how often they had gambled on each form over the past 12 months and this was converted into days per year. For example, if the participant replied 'once or twice', this was recorded and then converted to 1.5 days per year.

For each form of gambling the days per year variable was severely positively skewed. This was due to the large percentage of participants not having any involvement with certain forms of gambling and a few participants who were heavily involved. Table 5-1 provides the mean (SD) and the median (min-max) for each form of gambling and also the percentage of participants who indicated no involvement in that form in the past 12 months. The final row represents the aggregate across all forms.

Table 5-1 - Days spent gambling on each form of gambling in past 12 months

Form (N=620)	Mean (SD)	Median (min-max)	No Involvement
Keno	9.52 (25.80)	0.00 (0-208)	59%
EGMs	35.72 (57.76)	12.00 (0-365)	24%
Horse/Greyhounds	35.08 (72.56)	1.50 (0-365)	32%
Sports	10.37 (33.78)	0.00 (0-208)	69%
Casino games not on internet	4.10 (20.46)	0.00 (0-365)	74%
Casino games internet	11.45 (53.56)	0.00 (0-365)	89%
Private gambling	6.10 (29.09)	0.00 (0-365)	83%
Total	112.34 (121.09)	57.00 (25.5-858)	-

From the table it is apparent that EGMs were the most frequently played followed by betting on horse and greyhound racing. However, it should be noted that there was high variability in the scores which hinders the accurate identification of a typical score. For the other forms of gambling, the majority of participants indicated no involvement in the past 12 months; however, there were some participants who were heavily involved in these forms.

Gambling expenditure

If a participant indicated that they had been involved in a form of gambling in the past 12 months, they were also asked how much money, not including winnings, they had spent on that form during the past 12 months. When measuring expenditure across the forms of gambling there were 88 cases where an initial problem with the CATI saw this question skipped. Furthermore there were an additional five cases where participants reported that they could not recall and did not provide an estimate. Hence, the sample size for this analysis was reduced to 527.

Table 5-2 presents the expenditure figure for each form of gambling for those participants who had engaged in that form over the past 12 months. As was the case with the frequency data, the expenditure distribution for all variables was positively skewed.

Table 5-2 - Expenditure (\$ per year) by form of gambling

Form	Mean (SD)	Median (min-max)
Keno (N=213)	336.45 (950.71)	100 (2-10000)
EGMs (N=400)	2380.67 (5762.00)	600 (2-60000)
Horse/Greyhounds (N=354)	4535.62 (33634.05)	410 (1-500000)
Sports (N=156)	2935.42 (12948.27)	200 (5-100000)
Casino games not on internet (N=117)	1803.30 (6290.67)	300 (6-60000)
Casino games internet (N=35)	2769.00 (8514.89)	200 (10-42000)
Private gambling (N=78)	462.67 (1149.10)	100 (3-6000)
Total (N=527)	6511.31 (31312.43)	1500 (3-510100)

Due to the skewness, the median expenditure is a better representation of typical expenditure than the mean. EGM's recorded the highest figure, with half the sample spending more than \$600 and half the sample spending less than \$600 in the past 12 months. However, the range of scores is very high, as it was for all forms of gambling, reflecting the heterogeneity of gamblers in the sample and making the identification of a typical score difficult.

Problem gambling in past 12 months

All participants completed the nine-item Problem Gambling Severity Index with questions framed within the past 12 months. The PGSI was scored in accordance with the user manual for the Canadian Problem Gambling Index (Ferris & Wynne, 2001) and using the rating scale of never = 0, sometimes = 1, most of the time = 2 and almost always = 3. Participants scores were totalled and categorised as 0 = non-problem, 1-2 = low risk, 3-7 = moderate risk and 8+ = problem gambling. Table 5-3 provides the frequencies for each category across both genders.

Table 5-3 - Problem gambling status by gender

PGSI Category	Men	Women	Total
Non-problem	136 (39%)	129 (48%)	265 (43%)
Low Risk	104 (30%)	62 (23%)	166 (27%)
Moderate Risk	80 (23%)	51 (19%)	131 (21%)
Problem Gambling	31 (9%)	27 (10%)	58 (9%)
Total	351	269	620

The largest proportion of the sample were categorised as non-problem gamblers and the numbers within each group diminished as the severity of gambling problems increased. In terms of moderate risk and problem gambling, the percentage of men and women were about equal. However, there was a considerable difference in gender for the non-problem and low risk categories with the percentage of men smaller in the non-problem category, but greater in the low risk category, compared to women.

Pearson's correlation was performed to assess the relationship between age and PGSI scores. Both variables were left in continuous form and a coefficient of $r = -0.19$ was revealed. This suggests that as age increased risk of problem gambling was marginally reduced for the current sample.

Age and gambling involvement over lifetime

Gambling behaviour was also assessed in relation to the age participants first gambled with money and their age when they commenced regular gambling. They were also asked if at any time in their life they had felt they might have a problem with gambling and, if they answered yes, were then asked at what age they first felt this.

When participants were asked what age they were when they first gambled with money, there were four participants who could not recall. A greater number ($n=37$) could not identify what age they were when they started to gamble at least once per week and there were also four participants who reported that they had felt that they may have had a problem with their gambling at some time, but could not recall how old they were when they first felt this.

Table 5-4 presents the results for all other participants and has also been divided into men and women. The variables were distributed relatively normally, except the 'first

gamble' question which was dominated by a peak around the age of 18 years (corresponding with the legal age for gambling).

Table 5-4 - Age and gambling involvement by gender

Age	Men	Women	Combined
First gamble with money	19.72 (8.51) N=351	28.14 (14.10) N=265	23.42 (12.16) N=616
Regularly gambled	28.76 (13.76) N=328	40.55 (16.30) N=255	33.91 (16.02) N=583
Self report problem gambling	31.41 (12.30) N=116	43.53 (12.74) N=68	35.89 (13.74) N=184
Current age	53.00 (17.45) N=351	56.00 (15.42) N=269	54.30 (16.65) N=620

The results show that for all three levels of involvement with gambling (first gambled, regular and problem) the mean age for women was around ten years more than for men. However, overall the average age for women in this sample was only three years higher than men suggesting that gambling experiences do occur later for women. It also appears that regular gambling occurs around ten years after first gambling with money and problem gambling occurs around three years after regular gambling (for those who experienced problem gambling).

Form of gambling associated with problem gambling

A total of 188 participants (30%) reported that at some time in their life they had felt that they might have a problem with their gambling. These participants were then asked the main type of gambling that was associated with this and participants generated their own response. Table 5-5 presents these results.

Table 5-5 - Form of gambling associated with problem gambling by gender

Form	Men	Women	Total
EGMs	49 (42%)	63 (90%)	112 (60%)
Racing	54 (46%)	4 (6%)	58 (31%)
Casino games	9 (8%)	2 (3%)	11 (6%)
Sports betting	3 (3%)	0	3 (2%)
Bingo/Housie	0	1 (1%)	1 (1%)
Two-up	1 (1%)	0	1 (1%)
Poker at home	1 (1%)	0	1 (1%)
Casino and racing	1 (1%)	0	1 (1%)
Total	118	70	188

For men, both EGMs and racing (horses/greyhound) were the dominant problematic forms but for women it was the EGMs that were cited overwhelmingly. These data generally reflect the popularity of these forms as indicated by the frequency and expenditure figures.

5.1.3 Mental health

Each of the potential co-morbid disorders was assessed via the same scales used in the treatment sample (Ch. 4) and a timeframe of the past 12 months.

Depression

The seven-item depression subscale of the DASS21 was administered to all participants. Table 5-6 presents the frequencies for each category and the normative sample results are presented next to each category level. Overall, it appears that the current sample was experiencing depression at levels similar to the Australian normative group from Lovibond & Lovibond (1995).

Table 5-6 - Depression by gender frequencies

Depression Category	Men	Women	Total
Normal (78%)	278 (79%)	202 (75%)	480 (77%)
Mild (9%)	28 (8%)	30 (11%)	58 (9%)
Moderate (8%)	21 (6%)	24 (9%)	45 (7%)
Severe (3%)	13 (4%)	8 (3%)	21 (3%)
Extremely Severe (2%)	11 (3%)	5 (2%)	16 (3%)
Total	351	269	620

Anxiety

Anxiety was also measured using a seven-item subscale from the DASS21. Table 5-7 presents the frequencies for each category and the normative sample results.

Table 5-7 - Anxiety by gender frequencies

Anxiety Category (Population %)	Men	Women	Total
Normal (78%)	279 (80%)	186 (69%)	465 (75%)
Mild (9%)	20 (6%)	20 (7%)	40 (7%)
Moderate (8%)	39 (11%)	45 (17%)	84 (14%)
Severe (3%)	9 (3%)	7 (3%)	16 (3%)
Extremely Severe (2%)	4 (1%)	11 (4%)	15 (2%)
Total	351	269	620

There was a slight deviance from the normative sample with anxiety. In particular, moderate levels of anxiety were more common in the current sample of gamblers by 6% when compared to the normative sample.

Alcohol abuse

Alcohol use was measured using the Alcohol Use Disorders Identification Test (AUDIT) and scored according to the World Health Organisation guidelines (Babor, Higgins-Biddle, Saunders, Monteiro, 2001). An alteration was made to the last two items and their time frame. With the original AUDIT, the first eight items are framed in the past 12 months but the last two items have response options that include 'at any time in the past'. Only responses for the past 12 months were available to participants in this study as this aligns with the study's major focus on the 12 month follow up.

Table 5-8 presents the frequency statistics for the current sample in relation to their alcohol use. The categories are in accordance with the AUDIT guidelines but need to be interpreted with caution due to the changes outlined above. For the current sample, the scores are likely to be slightly lower than what they may have been if the original version of the AUDIT was implemented.

Table 5-8 - Alcohol abuse by gender frequencies

AUDIT Category	Men	Women	Total
Low Risk	193 (55%)	222 (83%)	415 (67%)
Moderate Risk	117 (33%)	41 (15%)	158 (26%)
High Risk	15 (4%)	2 (1%)	17 (3%)
Harmful Use	26 (7%)	4 (2%)	30 (5%)
Total	351	269	620

A notable feature of this table is that men were more prevalent in the moderate risk to harmful use categories than women.

Nicotine dependence

Nicotine dependence was measured using the six-item Fagerstrom Test for Nicotine Dependence (Heatherton, Kozlowski, Frecker & Fagerstrom, 1991). The categorisation of scores presented in Table 5-9 was based on the suggestions of Fagerstrom, Heatherton & Kozlowski (1991). The current sample was dominated by non-smokers and there was also no participant who scored in the Very High range.

Table 5-9 - Nicotine dependence by gender frequencies

Nicotine Dependence	Men	Women	Total
Non-smoker	245 (70%)	181 (67%)	426 (69%)
Very Low	10 (3%)	7 (3%)	17 (3%)
Low	65 (19%)	57 (21%)	122 (20%)
Medium	19 (5%)	15 (6%)	34 (6%)
High	12 (3%)	9 (3%)	21 (3%)
Very High	0	0	0
Total	351	269	620

Drug abuse

Prior to the administration of the ten item Drug Abuse Screening Test (DAST-10; Skinner, 1982), participants were asked if, in the past 12 months, they had used prescription drugs in excess of the directions or if they had used recreational drugs other than alcohol or nicotine. If they responded with some degree of agreement to either of these they were then administered the DAST-10. Each item was scored using the same procedure for the treatment sample (Ch. 4). Table 5-10 presents the frequencies for each grouping of the DAST-10. A score of three to five would place a participant in the Moderate category, six to eight in the Substantial category and nine to ten in the Severe category.

Table 5-10 - Drug abuse by gender frequencies

Drug abuse	Men	Women	Total
No use/problems	288 (82%)	239 (89%)	527 (85%)
Low	34 (10%)	25 (9%)	59 (10%)
Moderate	21 (6%)	3 (1%)	24 (4%)
Substantial	6 (2%)	2 (1%)	8 (1%)
Severe	2 (1%)	0	2 (0%)
Total	351	269	620

Less than 1 percent of the sample scored in the substantial or severe range for Drug Abuse, with no women and two men scoring in the severe range.

Impulsivity facets

Table 5-11 provides the means and standard deviations for each impulsivity facet with the possible range of scores indicated in brackets after the name of each measure.

Table 5-11 - Impulsivity facet means by gender

Impulsivity Facet	Men	Women	Combined
Premeditation (11-44)	17.97 (5.80)	17.71 (5.68)	17.86 (5.74)
Negative Urgency (12-48)	25.51 (8.17)	26.84 (8.46)	26.09 (8.32)
Sensation seeking (12-48)	30.28 (9.04)	24.04 (8.48)	27.57 (9.32)
Positive Urgency (14-56)	22.70 (9.25)	21.33 (8.28)	22.11 (8.86)

As with the treatment sample, the major difference between men and women was on the sensation seeking scale with men scoring six points higher than women.

5.1.4 Age of onset summary

Participants were then asked if, at any time during their lifetime, they had felt they might have a serious problem with the disorder (e.g., anxiety, alcohol use). By providing participants with the scale first, it was expected that this would help define the disorder to the participant and negate the need for definitions, as undertaken for the treatment sample online (Ch. 4). Also, if participants sought clarification on the meaning of 'serious problem' they were given the prompt of 'considered seeking treatment for'.

Table 5-12 presents the mean age of onset for each disorder. For those who had identified that they had felt a serious problem there was a small number who could not recall their age at the time (i.e., missing cases). For depression there were four, anxiety and alcohol use had three and nicotine had eight. However, for the drug abuse there was a problem with the way the questionnaire had been structured on the CATI system (a proof reading error by the researchers). Participants who indicated that they had not had any drug abuse issues in the past 12 months were not skipped over the DAST-10 to the lifetime question about drug use, but were skipped to the next section of the questionnaire. However, in attempt to rectify this problem, the 455 participants at Time 2 were asked this question (except the 36 that provided this data at Time 1). The end result was that the analysis for this variable is based on a sample of 425 not 620 as is the case with the other co-morbidities.

Table 5-12 - Mean age of first onset by disorder

Disorder	Men	Women	Total
Gambling	31.41 (12.30) N=116	43.53 (12.74) N=68	35.89 (13.74) N=184
Depression	34.65 (14.67) N=104	33.76 (14.27) N=89	34.24 (14.45) N=193
Anxiety	33.66 (12.83) N=92	33.92 (14.46) N=79	33.78 (13.56) N=171
Alcohol	28.02 (9.85) N=86	28.48 (8.41) N=31	28.15 (9.45) N=117
Nicotine	23.54 (8.05) N=167	24.26 (11.87) N=121	23.85 (9.82) N=288
Other Drugs	22.36 (6.36) N=33	25.85 (10.46) N=13	23.35 (7.78) N=46

Table 5-12 shows that men and women were very similar with regard to their mean age. Most of the distributions were bell-shaped, with the most skewed being nicotine

(both men and women) and drug abuse for men. However, the median scores were close to the means with the largest difference being for women and nicotine where the median was just over four years less (i.e. 20 years). The data for the self-reported gambling problems is presented again in this table for ease of comparison.

The striking trend in this table is the similarity between men and women in the age of onset for all disorders except 'other drugs' and problem gambling. Interpretation of the 'other drugs' variable is limited by the small sample size who indicated a drug problem, but the problem gambling difference in mean years showed a distinct later onset for women than men. This was not a feature for depression, anxiety, alcohol or nicotine.

A key comparison for the current study is the relationship between the mean age of onset for problem gambling and the other disorders. For women, the mean age for problem gambling was higher than all other disorders. For men, the same pattern occurred with alcohol, nicotine and drugs, however, the mean age of onset for depression and anxiety was slightly higher than for problem gambling.

5.2 Temporal sequencing analysis

5.2.1 Temporal sequencing

There were 188 (30%) participants who indicated that, at some stage in their life, they believed they had a problem with gambling. As with the treatment seeking sample the first step in assessing the temporal sequencing of problem gambling with other disorders was to categorise the age of experiencing a disorder as either before, in the same year, or after the first onset problem gambling. This would allow for a similar analysis as that of the treatment group, namely several 2 x 3 chi-squares and MANOVA or factorial ANOVA. However, with a smaller sample size of problem gamblers the assumptions of these tests were not met for many of the mental health variables. Where appropriate, descriptive statistics have been provided and interpreted.

Depression

Table 5-13 presents the frequencies for those participants who indicated a problem with their gambling and also depression. The total sample size in Table 5-13 is 88. This is because there were 188 participants who indicated that they had felt at some time a serious concern about their gambling, but 4 of these could not recall the age they were when they first felt this, leaving 184. There were also two of these participants who had experienced depression, but could not recall the age when they first felt depression

(leaving 182). There were 94 (52%) of these participants who indicated that they had never had a serious problem with depression which left the final sample size at 88.

Table 5-13 - Problem gambling and depression frequencies

Sequence	Men	Women	Total
PG before depression	28 (57%)	9 (23%)	37 (42%)
PG same year depression	2 (4%)	2 (5%)	4 (5%)
PG after depression	19 (39%)	28 (72%)	47 (53%)
Total	49	39	88

There are several notable features of Table 5-13. Gender differences are apparent when comparing the column data for men and women. Whilst very few men or women indicated that problem gambling and depression first occurred in the same year, men were more likely to indicate that problem gambling occurred before depression than after depression (57% compared to 39%). Women, however, were more likely to indicate that problem gambling occurred after depression (72% to 23%).

To further examine this relationship a 2 x 2 chi-square analysis was undertaken with gender (male/female) and onset (before/after). These four cells have been shaded grey in Table 5-13 and the analysis did not include the same year data due to small expected frequencies. The assumptions of the 2 x 2 chi-square analysis were met (independence, expected frequencies > 5) and the results revealed a $\chi^2 (1, N=84) = 10.44$ ($p = .001$), $\Phi = .35$. This indicates that there was a significant, weak to moderate relationship between gender and the problem gambling/depression sequence.

A calculation of odds ratios indicated that the odds of men first experiencing gambling problems before first experiencing depression compared to after is 4.59 times greater than that for women. However, it must be reiterated that the generalisability of this result is limited to those who had felt both a serious problem with gambling and with depression at some time in their life. The largest group of problem gamblers in this sample did not report experiencing depression.

As with the analysis of the treatment seeking sample the analysis of the number of years between the first onset of disorders was hindered by the small sample size, particularly for women in the 'PG before depression' group (i.e. $n=9$). Building upon the finding in the previous chapter, an independent samples t-test was only undertaken on

the 'PG after depression' group comparing men and women. Results indicated a $t(45) = 2.46, p = .02$ with the mean number of years between the first onset of disorders being significantly higher for women (i.e. 14.50 vs. 7.84). Table 5-14 displays the means for all cells.

Table 5-14 - Problem gambling and depression mean years between first onset

Sequence	Men	Women	Total
PG before depression	11.46 (11.44)	6.33 (7.12)	10.22 (10.70)
PG after depression	7.84 (9.55)	14.50 (10.72)	11.81 (9.60)
Total	9.59 (9.70)	11.87 (10.59)	10.60 (10.11)

Anxiety

The results for anxiety were very similar to depression. A large number of participants who had experienced problem gambling had never experienced a problem with anxiety (106 or 58%) and this left a sample size of 78. As shown in Table 5-15 the smallest group of the remaining participants were those who first experienced anxiety at the same age as when they first experienced problems with their gambling. These numbers were too small to be included in a 2 x 3 chi-square analysis. A 2 x 2 chi-square analysis of gender with onset (before/after) revealed a $\chi^2(1, N=72) = 10.99 (p = .001), \Phi = 0.39$. This is similar to the result for depression, with the relationship between gender and sequence being slightly stronger for anxiety. Furthermore men were 5.86 times more likely to first experience problem gambling before anxiety than after anxiety compared to women.

Table 5-15 - Problem gambling and anxiety frequencies

Sequence	Men	Women	Total
PG before anxiety	22 (51%)	6 (17%)	28 (36%)
PG same year anxiety	4 (9%)	2 (6%)	6 (8%)
PG after anxiety	17 (40%)	27 (77%)	44 (56%)
Total	43	35	78

With regard to the number of years between the first onset of problem gambling and the first onset of anxiety there were again a very small number of women in the 'PG before anxiety' group (n=6). With a reasonable number of men and women in the 'PG after anxiety' group and given the past results have shown this comparison to be

consistently significant, an independent samples t-test was undertaken on these two means. Results indicated that there was a significant difference between men and women, from the 'PG after anxiety' group in the mean number of years between the first onset of problem gambling and the first onset of anxiety, $t(41.96) = 2.35, p = .02$. As with previous analyses, the mean number of years was significantly greater for women than men. Table 5-16 displays the means for each cell.

Table 5-16 - Problem gambling and anxiety mean years between first onset

Sequence	Men	Women	Total
PG before anxiety	11.14 (10.12)	6.50 (4.51)	10.14 (9.34)
PG after anxiety	9.65 (6.89)	15.89 (10.72)	13.48 (9.83)
Total	9.51 (8.91)	13.37 (10.71)	11.24 (9.88)

Alcohol

Table 5-17 provides the results for alcohol. Most of the 188 problem gamblers had not experienced any serious problems with alcohol (127 or 69%) and of those who had, few indicated that it first occurred in the same year as their gambling problems (n=6). Furthermore, there did not appear to be a relationship between gender and onset (before/after) with a greater number of both genders reporting that problem gambling first occurred after the first occurrence of an alcohol use problem. This was confirmed with a 2 x 2 chi-square failing to achieve significance $\chi^2(1, N=50) = 0.25, p = .61, \text{Phi} = .07$. It would appear that for both men and women who experience both problem gambling and alcohol problems, the problem gambling is more likely to first occur after the first occurrence of an alcohol problem.

Table 5-17 - Problem gambling and problem alcohol use frequencies

	Men	Women	Total
PG before alcohol	13 (33%)	4 (25%)	17 (30%)
PG same year alcohol	4 (10%)	2 (13%)	6 (11%)
PG after alcohol	23 (58%)	10 (63%)	33 (59%)
Total	40	16	56

When examining the mean number of years between disorders it should be noted that there were small sample sizes in the majority of cells. Table 5-18 provides the mean scores for each cell and no further inferential analyses were undertaken due to the

limitations of such a small sample. Rather, inspection of the descriptive statistics suggests a similar pattern to the previous mental health variables (depression and anxiety) with the largest mean being for women in the 'PG after alcohol' group.

Table 5-18 - Problem gambling and alcohol abuse mean years between first onset

Sequence	Men	Women	Total
PG before alcohol	10.92 (6.60)	5.50 (2.89)	9.65 (6.31)
PG after alcohol	12.22 (11.25)	19.60 (10.28)	14.45 (11.34)
Total	10.58 (9.89)	13.63 (11.45)	11.45 (10.35)

Nicotine dependence

The frequencies for nicotine dependence described in Table 5-19 show that the majority of the problem gamblers indicated that at some stage in their life they believed they were nicotine dependent. The final sample size was 107, which was the largest of all mental health variables thus far, but despite this, the number of women in the 'PG before nicotine' group was very small (n=3). As with alcohol, this prohibited further frequency analysis. Nonetheless, it would appear that for both genders, problem gambling concerns tend to first occur after a nicotine dependence concern with 74% of the sample falling into this category. This result tends to match previous data collected in this study which shows in general that smoking dependence occurs at a younger age than gambling problems.

Table 5-19 - Problem gambling and nicotine dependence frequencies

Sequence	Men	Women	Total
PG before nicotine	16 (25%)	3 (7%)	19 (18%)
PG same year nicotine	4 (6%)	5 (12%)	9 (8%)
PG after nicotine	44 (69%)	35 (81%)	79 (74%)
Total	64	43	107

In relation to the mean number of years between the first onset of gambling problems and nicotine dependence, the largest score was again the women in the 'after' group. An independent samples t-test revealed a $t(77) = 2.90$, $p = .005$ indicating that the mean score for women in 'PG after nicotine' group was significantly larger than that for men in the same group. All means are presented in Table 5-20.

Table 5-20 - Problem gambling and nicotine dependence mean years between first onset

Sequence	Men	Women	Total
PG before nicotine	11.25 (8.11)	4 (4.36)	10.11 (8.02)
PG after nicotine	14.18 (9.25)	21 (11.64)	17.20 (10.86)
Total	12.56 (9.29)	17.37 (13.05)	14.50 (11.15)

Drug abuse

As was mentioned earlier only 425 of the 620 participants received the lifetime experience question in relation to drug abuse. Of these, there were only 46 participants who indicated experiencing symptoms of drug abuse at some stage in their life. However, there were only 29 participants who indicated experiencing both drug abuse and problem gambling (i.e. 15% of the problem gambling group).

Table 5-21 - Problem gambling and drug abuse frequencies

Sequence	Men	Women	Total
PG before drugs	5 (26%)	2 (20%)	7 (24%)
PG same year drugs	0	0	0
PG after drugs	14 (74%)	8 (80%)	22 (76%)
Total	19	10	29

Table 5-21 provides the cross-tabulation of gender with sequence for the drug abuse variable and as would be expected there were some very small cell sizes. With expected counts in the 'PG before drugs' group being below 5, chi-square analysis could not be undertaken. It is apparent from the table that the majority of participants reported experiencing problem gambling after a drug abuse problem. This pattern was similar for both genders.

Analysis of the mean number of years between disorders was also hindered by the small sample sizes. Table 5-22 presents the means, which do not appear to follow the trend of the previous mental health variables. However, the small sample size precludes speculating about these data.

Table 5-22 - Problem gambling and drug abuse mean years between first onset

Sequence	Men	Women	Total
PG before drugs	5.40 (4.72)	10.50 (10.61)	6.86 (6.31)
PG after drugs	11.29 (7.78)	7.37 (6.78)	9.86 (7.52)
Total	9.74 (7.47)	8.00 (7.07)	9.14 (7.25)

5.2.2 Temporal sequencing analysis summary

This subsection of the report has examined the temporal sequence of the first onset of a range of mental health behaviours in the 188 (30%) regular gamblers who indicated having experienced a problem with their gambling. This onset was mapped as ‘before’, ‘at the same time’ or ‘after’ the occurrence of their first onset of problem gambling.

More than half of problem gamblers noted that they had never experienced depression or anxiety. Of those who had, gender differences in time of onset were noted for both conditions. Women were 4.59 times more likely than men to experience problem gambling after depression and 5.86 times more likely to experience problem gambling after anxiety. Women were also more likely, according to the descriptive results, to experience problem gambling after alcohol abuse, nicotine dependence and drug abuse than men. It was found that the association between gender and the temporal sequence problem gambling with depression and problem gambling with anxiety was statistically significant. However, the small sample sizes hindered inferential analysis for the other conditions.

The difference in mean number of years between the first onset of a disorder by gender was significantly higher for women in the problem gambling after depression category and the problem gambling after anxiety category. That is, of all participants who experienced their first onset of problem gambling after their first onset of depression or anxiety, women in the sample had a significantly greater number of years between these disorders than men. The descriptive results for the other disorders suggest a similar pattern.

5.3 Predictors of problem gambling severity

5.3.1 Predictors

As with the treatment sample the four measures of impulsivity were utilised as predictors of the severity of problem gambling at first onset. All participants provided data for this analysis which was performed separately for men (n=351) and women (n=249).

5.3.2 Levels of impulsivity

As with the treatment sample, the correlations amongst predictors ranged from weak to high with the highest again being between negative urgency and positive urgency. For men a $r(349) = .67$ was achieved and for women this figure was $r(247) = .59$. Table 5-23 presents the correlation coefficients between the four impulsivity facets and the measure of problem gambling, the PGSI.

Table 5-23 - Impulsivity and PGSI correlations

	Negative Urgency	Premeditation	Sensation Seeking	Positive Urgency
Men PGSI	.45***	.27***	.12*	.39***
Women PGSI	.41**	.22***	.07	.38***

*p < .05, ** p < .01 ***p < .001

For both genders there were the same three impulsivity facets that showed weak to moderate correlations with problem gambling severity. These were negative and positive urgency and also (lack of) premeditation. In a bivariate analysis sensation seeking does not appear to be related to problem gambling severity, however, all variables needed to be assessed simultaneously to better understand their relationship with problem gambling.

For both genders there were large sample sizes and this improves the robustness of the regression procedure and de-emphasises the rules of assumption testing. There were three multivariate outliers for women and three for men and these scores were checked for accuracy against the original data but retained in the final analysis. The residual scatterplots also suggested a failure to meet the assumption of homoscedasticity for both genders with the model being less accurate at predicting higher scores. The standardised regression coefficients are presented in Table 5-24.

Table 5-24 - Impulsivity and PGSI standardised regression coefficients

	Negative Urgency	Premeditation	Sensation Seeking	Positive Urgency
Men PGSI	.32***	.10	-.01	.15*
Women PGSI	.30***	.10	-.05	.15*

*p < .05, ***p < .001

As can be seen, there was a similar result for both men and women, as was the case with the bivariate correlations above. Negative urgency was the strongest significant predictor with only positive urgency also achieving significance (but very weak). Both sensation seeking and (lack of) premeditation did not achieve significance in the final regression model.

In comparison to the same analysis performed on the treatment sample (Ch. 4) the results share some similarity. In particular negative urgency has shown to be a consistent positive predictor of problem gambling with a standardised regression coefficient of around .30. In the treatment sample, negative urgency predicted the severity of the first onset of problem gambling. In the current community sample, negative urgency predicted the severity of problem gambling in the past 12 months. However a difference between the two samples was that the treatment sample analysis required some manipulation of variables (i.e., the removal of positive urgency from the model) and sensation seeking was a significant but weak predictor for women. This may be explained by the methodology employed for the treatment sample which required participants to score the PGSI at the time they first experienced problem gambling. This is likely to be less accurate than the past 12 month time frame used in this analysis. Nonetheless, the result for negative urgency does appear to be robust across both samples.

Although impulsivity has been researched extensively, the tendency to experience strong impulses under conditions of negative affect has not been well represented in the gambling literature. High scorers on the negative urgency scale are likely to engage in impulsive behaviours to alleviate negative emotions despite the harmful consequences of the behaviour. For the current sample of regular gamblers, their level of negative urgency was found to be a weak, but statistically significant predictor of the severity of problem gambling.

5.4 Summary of time 1 National Telephone Survey results

Of the 620 regular gamblers who participated in Time 1, electronic gaming machines were the most frequently played form of gambling among this community sample and, consequently, attracted the most expenditure (median = \$600 per year). This was followed by betting on horse and greyhound racing. For the other forms of gambling, the majority of participants indicated no involvement in the past 12 months; however, there were some participants who were heavily involved in these forms. About 30 per cent (n=188) of the sample self-reported that they had experienced problem gambling at some time in their life, with women most likely to indicate a problem with EGMs (90%) and men EGMs (42%) and racing (46%).

Participants were assessed for problem gambling levels and each of the five mental health disorders tested throughout this study using both a 'past 12 months' timeframe with a scale (e.g. PGSI, DASS) and a self-report lifetime experience. For the previous 12 months, problem gambling levels were at 9% which reflects the sample being regular gamblers compared to typical prevalence results where problem gambling is around 1% - 2%. Depression and anxiety were present in the sample at levels similar to the population. Analysis of other screening tools indicated that very few participants indicated high or harmful use of alcohol (8%), nicotine (3%) or drugs (8%). As for the impulsivity facets, the only salient difference between men and women were the higher mean score for men on the sensation seeking facet compared to women. This result was similar to that of the treatment sample.

From the lifetime data, the mean age of onset of most disorders was similar for both men and women with the exception of problem gambling (men = 31.4 years, women = 43.5 years) and other drugs, although the small sample size of those reporting a problem with drugs limits the reliability of the 'other drugs' findings. For women, the mean age for problem gambling was higher than all other disorders whereas for men this pattern was absent.

The temporal sequencing of the first onset of each mental health disorder was subsequently categorised as 'before', 'same year' or 'after' the occurrence of the first onset of problem gambling (n = 188). That is, using the age provided by participants for when they first experienced a disorder allowed for categorisation of the relationship with their first onset of problem gambling. More than half of 188 participants who had experienced problem gambling reported that they had never experienced depression or anxiety in their lifetime. Of those who had, women were 4.59 times more likely than

men to experience problem gambling after depression and 5.86 times more likely than men to experience problem gambling after anxiety. These findings were statistically significant and were further supported by an analysis of the mean number of years between disorders. The defining feature of this data set appeared to be the very late onset of problem gambling for women.

In relation to impulsivity facets predicting problem gambling, the facet negative urgency was the best predictor when all predictors were entered into a regression simultaneously. This result was largely in agreement with that of the treatment sample in Chapter 4.

Chapter 6 Time 2 of the National Telephone Survey

This chapter presents the results from Stage 5 of the current project. This stage is Time 2 of the longitudinal component and as such required administering many of the same scales to the same participants from Time 1 (Chapter 5). The focus of this chapter is on the prospective analysis of problem gambling and co-morbid conditions, 12 months after initial contact. The analysis will augment the retrospective accounts provided by both the 267 treatment seeking gamblers and the 620 regular gamblers surveyed. There were 455 (73%) participants in this penultimate stage of the project.

6.1 Descriptive information

6.1.1 Gender, age and location

Table 6-1 displays the demographic information from Time 1 and Time 2. Time 2 participants were a sub-sample of Time 1 recruited via convenience sampling and as such there is greater potential for the two samples to vary over a probability sampling method.

However, as can be seen in Table 6-1, with regard to the basic demographic variables tested, both the full sample (N=620) and the follow-up sub-sample (N=455) were generally consistent. The Time 2 sample was slightly older and contained a slightly greater proportion of women but most other characteristics were similar.

Table 6-1 - Comparative demographic information in the Time 1 and Time 2 sample

	Time 1 (N=620)	Time 2 (N=455)
Men	57%	55%
Women	43%	45%
Mean age	54.30 years	56.43 years
Range	18 - 91	19 - 87
NSW	33%	31%
Vic	25%	27%
QLD	16%	17%
South Australia	9%	10%
Tasmania	7%	8%
Western Australia	4%	4%
Northern Territory	2%	2%
ACT	2%	2%

6.1.2 Gambling behaviour

Some basic gambling behaviour measures from Time 1 were again utilised at Time 2 including frequency across the forms of gambling for Keno, poker machines/EGMs, horse and greyhound racing, sports events, casino games not on the internet, casino games on the internet and private gambling for money. All participants at Time 2 also completed the PGSI for the previous 12 months.

Frequency of gambling

There was a difference between the samples in terms of frequency of gambling with the sample at Time 2 gambling around 13 times per year less frequently, in total, than the Time 1 sample. However, the basic pattern across the forms of gambling was very similar with EGMs remaining the most frequently played form of gambling, followed by horse and greyhound racing.

Table 6-2 - Time 1 and Time 2 frequency of gambling (times per year) by form

	Time 1 (N=620)	Time 2 (N= 455)
Keno	9.52 (25.80)	11.54 (40.97)
EGMs	35.72 (57.76)	37.17 (63.57)
Horse/Greyhounds	35.08 (72.56)	28.04 (63.52)
Sports	10.37 (33.78)	8.98 (37.67)
Casino games not on internet	4.10 (20.46)	4.73 (4.72)
Casino games internet	11.45 (53.56)	4.74 (34.31)
Private gambling	6.10 (29.09)	3.77 (24.90)
Total	112.34 (121.09)	98.97 (123.04)

Problem gambling in past 12 months

As can be seen in Table 6-3, the Time 2 sample comprised a much larger number of non-problem gamblers and fewer 'at-risk' gamblers as shown in Table 6-3. Given the known link between frequency of play and risk of problem gambling this result aligns with the lower frequency of gambling statistics from the previous section.

Table 6-3 - PGSI status in the Time 1 and Time 2 sample

	Time 1 (N=620)	Time 2 (N=455)
Non-problem	43%	55%
Low risk	27%	23%
Moderate risk	21%	16%
Problem gambling	9%	6%

It must be remembered Time 2 participants were a convenience sub-sample of the original 620 from Time 1. This sampling strategy has weaknesses as the figures suggest that the heavier and more problematic gamblers had a reduced chance for inclusion at Time 2. That is, the sample size in Time 2 was achieved on a 'first-come, first-served' basis without numerous call-backs to hard to reach participants (as was the case with Time 1). These hard to reach participants may have been those more frequently engaged in gambling activities and less likely to be home answering the telephone.

6.1.3 Mental health

The 455 participants at Time 2 were administered the same mental health measures as Time 1. Impulsivity was not measured at Time 2 as it is considered to be a stable personality trait that would not change over 12 months. The descriptive information below is provided alongside the Time 1 information for comparative purposes. However, any differences between the two groups may be due to differences in the sampling method rather than any changes that have occurred over the past 12 months.

Depression

As shown in Table 6-4 the categorisation of depression scores were generally consistent across Time 1 and Time 2.

Table 6-4 - Depression in the Time 1 and Time 2 samples

	Time 1 (N=620)	Time 2 (N=455)
Normal	77%	75%
Mild	9%	11%
Moderate	7%	10%
Severe	3%	4%
Extremely Severe	3%	1%

6.1.4 Anxiety

As with depression, anxiety scores (shown in Table 6-5) at Time 2 were distributed in a similar manner to Time 1.

Table 6-5 - Anxiety in the Time 1 and Time 2 samples

	Time 1 (N=620)	Time 2 (N=455)
Normal	75%	77%
Mild	7%	8%
Moderate	14%	10%
Severe	3%	4%
Extremely Severe	2%	2%

Alcohol abuse

As with PGSI scores, the AUDIT classification of scores presented in Table 6-6 show that at Time 2 more participants were in the lowest category and fewer in the higher risk categories.

Table 6-6 - Alcohol abuse in the Time 1 and Time 2 samples

	Time 1 (N=620)	Time 2 (N=455)
Low risk	67%	76%
Moderate Risk	26%	20%
High Risk	3%	2%
Harmful use	5%	2%

Nicotine dependence

As per Table 6-7 there was a slight tendency for the Time 2 sample to have greater representation in the lowest group, but in general there was good agreement.

Table 6-7 - Nicotine dependence in the Time 1 and Time 2 samples

	Time 1 (N= 620)	Time 2 (N=455)
Non-smoker	69%	73%
Very Low	3%	4%
Low	20%	16%
Medium	6%	4%
High	3%	3%
Very High	0%	0%

Drug abuse

As with problem gambling, alcohol use and nicotine dependence the Time 2 sub-sample were less likely to have drug abuse problems than the full sample from Time 1. This is shown in Table 6-8.

Table 6-8 - Drug abuse in the Time 1 and Time 2 samples

	Time 1	Time 2
No use/problems	85%	92%
Low	10%	5%
Moderate	4%	2%
Substantial	1%	1%
Severe	0%	0%

6.2 Summary

The descriptive analysis provided above was largely undertaken to determine the representativeness of the sample of 455 who participated in Time 2. With Time 1 recruitment there were some issues with achieving a random sample of the population of regular gamblers and the results above indicate that this was further compromised with the sampling procedure employed at Time 2. The most notable difference was the reduction in gambling behaviour, including problem gambling, for the sample overall at Time 2. This result highlights the need to interpret the analysis of the 455 participants who provided data at both Time 1 and Time 2 with some caution.

6.3 Temporal sequencing analysis

The results of the current study thus far have suggested that a difference exists between men and women in the temporal sequencing of problem gambling with other disorders. However, the data for the previous analyses has been retrospective or cross sectional data and only allowed limited conclusions to be drawn. The current study sought to build on this evidence by analysing prospective data from 455 regular gamblers to further answer the first research question:

1. What is the temporal relationship between problem gambling and other co-occurring disorders?

6.3.1 Analysing longitudinal data

Despite some sampling issues, it is important to re-iterate some methodological and statistical qualities of the current study that strengthen the validity of any conclusions drawn. First, the variables at each time point (i.e. Time 1 and Time 2) were assessed at the same time. That is, problem gambling at Time 1 was assessed at the same time as depression at Time 1. This was also the case for measurement at Time 2 with all

variables being assessed at the same time. This issue of synchronicity strengthens the case for determining causation and the predictive validity of the results. Second, the time lag between Time 1 and Time 2 was only 12 months. Any relationships found is likely to be small as the sample were largely in good mental health and would likely remain in good mental health despite being regular gamblers. However, with a robust sample size this should allow for the identification of small effects as statistically significant. Third, the analysis of each temporal sequence model was performed with structural equation modelling (SEM). This approach considers issues such as error variance, collinearity, and the discriminant and concurrent validity of the measures whilst providing standardised coefficients that can be directly compared. It is a more stringent and flexible approach compared to classical approaches that rely on internal consistency coefficients, assumption testing and cross-lagged modelling of longitudinal data with bivariate correlations or multiple regression analysis.

The following table contains a series of standardised regression coefficients (commonly referred to as Beta in SPSS output) that were obtained via structural equation modelling using the latent variable modelling program MPlus (version 6.11). For each co-morbidity disorder and for each gender a different model was tested. The size of the sample of each gender (250 men and 205 women) was adequate for this statistical technique as the models consider relatively simple relationships between a small numbers of variables. Pictorially, each model looked like the example in Figure 6-1.

In this model problem gambling at Time 1 is measured by the 9 item Problem Gambling Severity Index (PGSI) and was left in its continuous form to better capture any change in problem gambling levels. Depression Time 1 is measured by the 7-item DASS and again was left in its continuous form. These measures was then repeated at Time 2. Absent from Figure 6-1 is the measurement part of the model which includes the 9 items used to measure problem gambling and the 7 items or variables used to measure depression. Figure 6-1 has been simplified to assist the reader in understanding the basics of the analyses undertaken. Each model assessed the relationship between problem gambling and other co-morbid disorders across a 12 month time frame whilst controlling for all other relationships between variables.

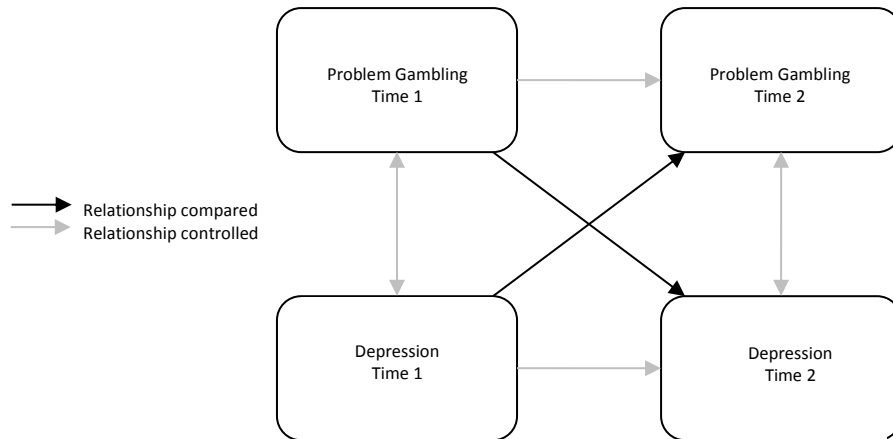


Figure 6-1 - Example of temporal relationship between problem gambling and each co-morbidity (e.g. depression)

For the temporal sequencing analysis, it is the coefficients on each diagonal path that is directly compared. That is, the model depicted tests the hypothesis that:

Problem gambling at Time 1 has a significantly different relationship with depression at Time 2 than depression at Time 1 has with problem gambling at Time 2.

It must be remembered that the purpose of these analyses is not to test the adequacy of each model or to identify the predictors of problem gambling, but to obtain standardised regression coefficients between problem gambling and other disorders. Because these have been assessed over time, the coefficients will better illuminate the nature of the temporal relationship between problem gambling and other co-occurring disorders. It should be noted that the figures provided for these diagonal relationships include controlling for the other variables in the model (however, not controlling for variables absent from the model). It should also be noted that the impulsivity facets are not included in this section as their temporal relationship with problem gambling would be before problem gambling develops as impulsivity is a trait that develops early in a person's life.

To assist with the interpretation of the results only the essential information is presented in the following table (i.e. the coefficients from the diagonal paths). These pathways represent the hypothesised direct relationships between problem gambling and co-morbid disorders across the two time points.

6.4 Results

Before any inferences can be drawn from the parameters estimated by a model, the model itself should be evaluated to see how well the theoretical model 'fits' the data. The standard benchmarks reported with structural equation modelling are the chi square statistic, χ^2 , which ideally should not be significant, the Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI). A major limitation of the χ^2 statistic, however, is that it is influenced by sample size and penalises larger samples such that in a large sample ($N > 200$), the chi-square statistic is usually always significant. Therefore, the relative or 'normed' chi-square (the ratio of χ^2 to degrees of freedom (df)) is frequently assessed along with RMSEA and CFI. The relative χ^2 indicates a close model fit to the data if the ratio is < 2 . In addition, RMSEA values < 0.05 are used to indicate close model fit and $CFI > .9$ suggests the model is an improvement over a hypothesised null model where there is zero correlations between variables. For the models tested, acceptable model fit statistics were achieved for all co-morbid disorders except drug abuse. With gender as a grouping variable the drug abuse model failed to converge after 1000 iterations and this variable was analysed differently and is presented after the other variables. Also, the measurement parts of each model were acceptable except the AUDIT scale for women. Due to continuing non-positive definite matrices seven of the ten items were removed leaving only items 1, 7 and 9 as indicators of alcohol abuse. This casts doubts over the alcohol results for women as these three items measure frequency of consumption (Q1), guilt/remorse after drinking (Q7) and alcohol related injury (Q9). Previous research has shown that alcohol abuse is a more complex dimension than these three items measure and hence, for females, the results need to be interpreted with caution.

For depression, anxiety and nicotine dependence there were no modelling issues. Table 6-9 displays the standardised coefficients between problem gambling (measured with the PGSI) and the other disorders with each as the predictor (Time 1) and the predicted (Time 2) variable. There were 250 men and 205 women in each of the samples. These standardised coefficients may be compared with the higher figure indicating a stronger relationship. For example, with men problem gambling at Time 1 was a significant predictor of depression 12 months later (Time 2) with a coefficient of .21. This is controlling for the level of Depression of Time 1 and the level of problem gambling at Time 2. However, Depression at Time 1 was not a significant predictor of problem gambling scores at Time 2 with a coefficient of only .01. Hence for the current

sample of male regular gambler it was found that problem gambling was a better predictor of future depression than depression was of future problem gambling.

It is important to remember that these participants were regular gamblers and therefore had frequent exposure to EGM gambling and, for males, gambling on racing. Having this exposure and having elevated levels of depression did not predict higher problem gambling levels 12 months later. However, having regular exposure to gambling and having elevated problem gambling scores was related to elevated depression scores 12 months later.

Table 6-9 - Relationship between problem gambling and co-morbid disorders by gender

	Time 1>>>Time 2	Men (N=250) Standardised Coefficients	Women (N=205) Standardised Coefficients
Depression (DASS)	Problem Gambling >>>Depression	.21***	.02
	Depression >>> Problem Gambling	.01	.01
Anxiety (DASS)	Problem Gambling >>> Anxiety	-.01	.22***
	Anxiety >>> Problem Gambling	.03	.06
Alcohol (AUDIT)	Problem Gambling >>> Alcohol Abuse	-.17**	.09
	Alcohol Abuse >>> Problem Gambling	-.07	-.04
Nicotine (FTND)	Problem Gambling >>> Nicotine Dep.	.02	.03
	Nicotine Dep. >>> Problem Gambling	-.02	-.02

** p < .01 ***p < .001

Aside from the problem gambling to depression relationship for men, the only other significant results found were for alcohol (men) and anxiety (women). The anxiety result for women was a similar finding to depression for men. That is, for women who gamble regularly (mostly on EGMs in the current sample), their problem gambling scores were predictive of their level of anxiety 12 months later. A higher level of problem gambling at Time 1 (regardless of level of anxiety) was related to a higher level of future anxiety. However, being a regular, female gambler with high anxiety was not related to higher problem gambling scores, 12 months later. The sequence appears to be that problem gambling comes before anxiety and not anxiety before problem gambling, in female regular gamblers. Whilst this may seem at odds with the treatment sample result which, for women, had problem gambling occurring after anxiety (Table 4-9), the treatment sample were framing their disorder in terms of age at first onset.

The alcohol abuse finding for men was a little more difficult to explain. Whilst it may appear that problem gambling comes before alcohol abuse and not the other way around, in the current analysis problem gambling scores were found to be negative predictors of future alcohol use. That is, higher PGSI scores at Time 1 were related to lower AUDIT scores 12 months later. However, the AUDIT was not a significant predictor of future problem gambling scores. It is difficult to explain why having higher problem gambling scores may protect a regular gambler from future alcohol use. Previous research suggests a positive relationship between problem gambling and alcohol use but in the current project there was one counsellor who seems to have captured the relationship between alcohol and problem gambling that matches the present finding (from Chapter 3).

I've had 11 years experience as a counsellor and with alcohol I've seen that alcohol abuse leads to problem gambling. Problem gambling seems to be the perfect cure for alcoholism because if they have an alcohol problem and they really get into gambling then people will cease the alcohol. They will devote themselves to gambling, which is incredible. And it's pretty hard for an alcoholic to stop [drinking], it's not easy. But gambling seems to do it ... a true problem gambler will give away the drink.

It is suggested here that alcoholism may lead to problem gambling, but once problem gambling is entrenched it “cures” the alcoholism. There is also perhaps a third variable explanation for the current result. High PGSI scores reflect an increase in gambling consumption and this takes time and money away from other activities, such as drinking. Further inspection of the relationship between the PGSI and the AUDIT indicated that it was the alcohol consumption items (frequency and amount of drinking) that were best predicted by the PGSI and not the alcohol related harm items. The question then becomes why was this result only for men and not women? The answer to this question may be because of the problems with the AUDIT in the measurement part of the model for women. Alternatively, there is always the possible explanation that the result is simply a spurious statistical finding explained by sampling error. Further sampling and testing would be needed to assess this and help explain this curious finding.

For all other results there was no statistically significant finding in either direction. Within the limits of the time-frame utilised it can only be concluded that there was no temporal sequence identified between problem gambling and the other co-morbidity disorders (i.e. depression for women, anxiety for men, alcohol abuse for women and nicotine dependence for either gender).

In relation to drug abuse the model failed to converge with gender as a grouping variable. When gender was removed and N=455 the model did converge but six of the ten items in the DAST needed to be removed (items 1, 2, 5, 6, 7 & 9, see Appendix B). Even after doing this, neither of the diagonal paths were significant with the problem gambling predicting later drug abuse coefficient being .09 ($p = .06$) and the drug abuse predicting problem gambling coefficient being -.01 ($p = .76$). As a last resort, two cross-lagged models were tested for each gender using basic correlations and all items in the DAST (Corrigan, Holmes, Luchins, Buican, Basit & Parks; 1994; Kenny & Harackiewicz, 1979; Marmor & Montemayor, 1977). However, for both genders there was a lack of synchronicity between the PGSI and AUDIT across the two time points (failing to meet one of the assumptions for cross-lagged modelling). For both genders, the two scales correlated significantly higher at Time 2 when compared to Time 1. This could be due to a third variable that was stronger at Time 2 than Time 1 (e.g., participants may have been more willing to disclose actual drug use to a person over the phone at Time 2 compared to Time 1). Our conclusion is that, for the current sample, there was no temporal relationship identified between problem gambling and drug abuse. The small number of drug abusers in the sample could have also had an effect on this finding.

6.4.1 Conclusion - Temporal sequencing

Overall, the current analysis built upon prior findings in the current project and substantially contributed to the question 'What is the temporal relationship between problem gambling and other co-morbidity disorders?' For the co-morbid disorders of nicotine dependence and drug abuse there was no significant temporal relationship found with problem gambling regardless of gender. Also for women no temporal relationship was found between problem gambling and depression or alcohol use whilst for men there was no temporal relationship found with problem gambling and anxiety.

However, for the sample of men who gambled at least once per fortnight it appears that the temporal sequence of problem gambling and depression is that problem gambling comes before depression. Also for men, problem gambling came before alcohol abuse, but it was a negative relationship with problem gambling predicting lower alcohol use. For women, the temporal sequence appears to be problem gambling comes before anxiety and anxiety levels were not related to future gambling problems.

6.5 Predicting problem gambling with co-morbid disorders

Building from the previous results another model was developed that included all co-morbid disorders entered together along with problem gambling at Time 1. These were conceptualised as predictors of problem gambling at Time 2 and the model was designed to address the other major research question:

2. Does the presence of a particular morbid condition or a series of co-morbidities predict the development or presence of problem gambling?

6.6 Analysis with structural equation modelling

Figure 6-2 below identifies the predictive pathways that exist between the other mental health disorders and problem gambling. This full model is applied to both men and women given the number of paths involved for analysis using structural equation modelling. That is, there were too many pathways to be estimated to test the model separately for men and women, given their sample sizes. The pathways in the diagram represent the hypothesised direct relationships between the independent and dependent variable. Absent are the covariate relationships that exist between variables. Essentially the model aims to test if the mental health variables at Time 1 (i.e. depression, anxiety, alcohol abuse, nicotine dependence, drug abuse) are significant predictors of problem gambling at Time 2 whilst controlling for problem gambling at Time 1. Again SEM was preferred over the more traditional approaches (e.g., multiple regression) as it provides more information particularly with regard to the measurement part of the model. The aim of the analysis was to test the significance of each path shown in Figure 6-2 and to compare the relative importance of each path via standardised regression coefficients. This will better illuminate the nature of the relationship between other mental health disorders and problem gambling. It should be noted that the impulsivity facets are not included in this model as they will be included in the next stage of model building.

6.6.1 Model estimation and evaluation

As was undertaken with the previous analysis, the model itself was evaluated to see how well the theoretical model 'fits' the data. Due to the size and complexity of the model, some variables in the measurement part of the model were excluded from the analysis in order to properly assess the structural part. The measurement part is the scales that measure each of the constructs, such as the six items on the Fagerstrom scale which measures nicotine dependence or the 10 items of the Drug Abuse

Screening Test. Some of these items caused problems during modelling due to such issues as the highly skewed distributions of many of the variables. This is a similar problem to that identified in the previous section with the AUDIT and the DAST-10.

In addition to the skewness, many of the indicator variables within the alcohol, smoking and drugs scales were dichotomous, or they may have been ordinal (more than two category responses in the questionnaire) but only two response categories were frequented by respondents, such that the MPlus program treated them as dichotomous variables. When the tetrachoric bivariate correlations for dichotomous and skewed data were analysed, there were some instances of a zero bivariate cell for one of the variables, resulting in a correlation of 1 between two indicator variables. Whenever this occurred the model solution was inadmissible.

These were considered data issues which may not be present in much larger samples but would not have been detected if standard multiple regression was used (the Cronbach's alphas for the DAST were .84 at Time 1 and .80 at Time 2). However, the overall model results could not be considered valid while ever it was based on analyses that contained illogical relationships, necessitating the removal of one of the items involved in these problematic bivariate relationships. The excluded variables from the current model included two questions from the AUDIT (items 6 and 10), one from the FTND (item 1), and four from the DAST (items 1, 2, 6, and 9). In general, this is an improvement over the previous analysis and but does highlight the weakness in using screening tests for research purposes.

After exclusion of the problem indicator variables an adequately fitting model was obtained given by relevant statistics including a relative $\chi^2 = 1.47$, RMSEA = 0.032 (90% CI RMSEA = 0.029 - 0.035) and CFI = .91.

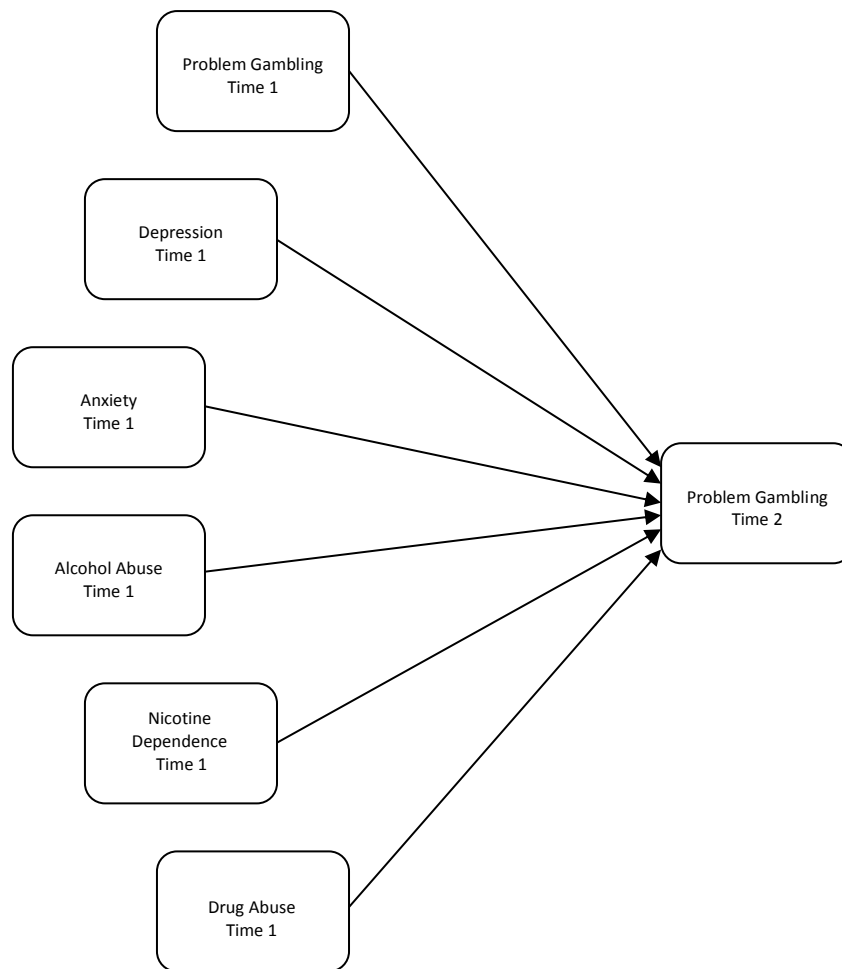


Figure 6-2 - Example predictive pathways

6.6.2 Model results

Standardised regression coefficients are provided in Table 6-10 for the model performed on all 455 regular gamblers. Problem gambling at Time 1 was by far the most significant predictor of problem gambling at Time 2, as given by the relative size and significance of its regression estimate (.54, $p < 0.001$).

Table 6-10 - Mental health predictors of problem gambling at Time 2

	Standardised Coefficient
Problem Gambling >>> Problem Gambling	.54***
Depression >>> Problem Gambling	.07
Anxiety >>> Problem Gambling	.05
Alcohol Abuse >>> Problem Gambling	-.12*
Nicotine Dependence >>> Problem Gambling	.13*
Drug Abuse >>> Problem Gambling	.24*

*p < .05, ***p < .001

Once problem gambling at Time 1 was taken into account, neither depression nor anxiety at Time 1 remained a significant predictor of problem gambling at Time 2 (.07, $p = 0.31$ and .05, $p = 0.53$, respectively). Interestingly, alcohol appeared to have a 'protective effect' (given by the negative sign) on problem gambling at Time 2, in that for every standard deviation increase in severity of alcohol issues at Time 1, there was 12% of a standard deviation reduction in problem gambling issues at Time 2, as demonstrated in the regression estimates provided in Table 6-10.

There was a similar result to that of men in the previous temporal sequencing analysis (-.07) however it failed to achieve significance. This previous analysis also included problem gambling as a predictor of alcohol use but did not include the other variables in the one model.

Other important results include, for every standard deviation increase in nicotine dependence at Time 1, there was 13% of a standard deviation increase in PGSI scores at Time 2. Finally, for every standard deviation increase in DAST scores at Time 1, there was 24% of a standard deviation increase in problem gambling issues at Time 2. All of these significant results must be considered as predictors over and above the level of problem gambling experienced by the participants at Time 1. That is, the regular gamblers in the current sample, regardless of their level of problem gambling, experienced a change in the problem gambling scores 12 months later. This change was associated with their alcohol use, nicotine dependence and drug abuse scores from the previous year.

The R-square for problem gambling at Time 2 indicated that the model accounted for 55% of the variance in problem gambling at Time 2. Although this figure is quite large, most of the variance was explained by problem gambling at Time 1.

6.6.3 Summary

The testing of the current model demonstrated that problem gambling at Time 1 was by far the most significant indicator of problem gambling at Time 2. After taking into account problem gambling at Time 1, the existence of co-morbid mood disorders (depression and anxiety) at Time 1 were not independent predictors of problem gambling at Time 2. However, substance abuse issues at Time 1 remained independent predictors of problem gambling at Time 2 even after taking problem gambling at Time 1 into account.

Interestingly, substance abuse issues had various effects on problem gambling at Time 2. For instance, alcohol abuse was a negative predictor of problem gambling indicating that as problem drinking increased, problem gambling decreased over the course of the year. After taking into account problem gambling at Time 1, drug abuse issues at Time 1 was the most significant, independent predictor of problem gambling at Time 2.

6.7 Predicting problem gambling with co-morbid disorders and impulsivity

The purpose of this section was to build upon the previous analysis to further investigate the research question:

2. Does the presence of a particular morbid condition or a series of co-morbidities predict the development or presence of problem gambling?

The major difference with this analysis as compared to the previous was the inclusion of the personality variables assessing four impulsivity facets (negative urgency, positive urgency, premeditation and sensation seeking). Neither this model shown in Figure 6-3, nor the previous could ever be considered complete predictive models of problem gambling. It is a much more complex phenomenon than either model has depicted. However, building a model with the psychological predictors aids understanding of how a series of co-morbidities (mood disorders and substance abuse) interplay with personality in the development of future problem gambling amongst regular gamblers.

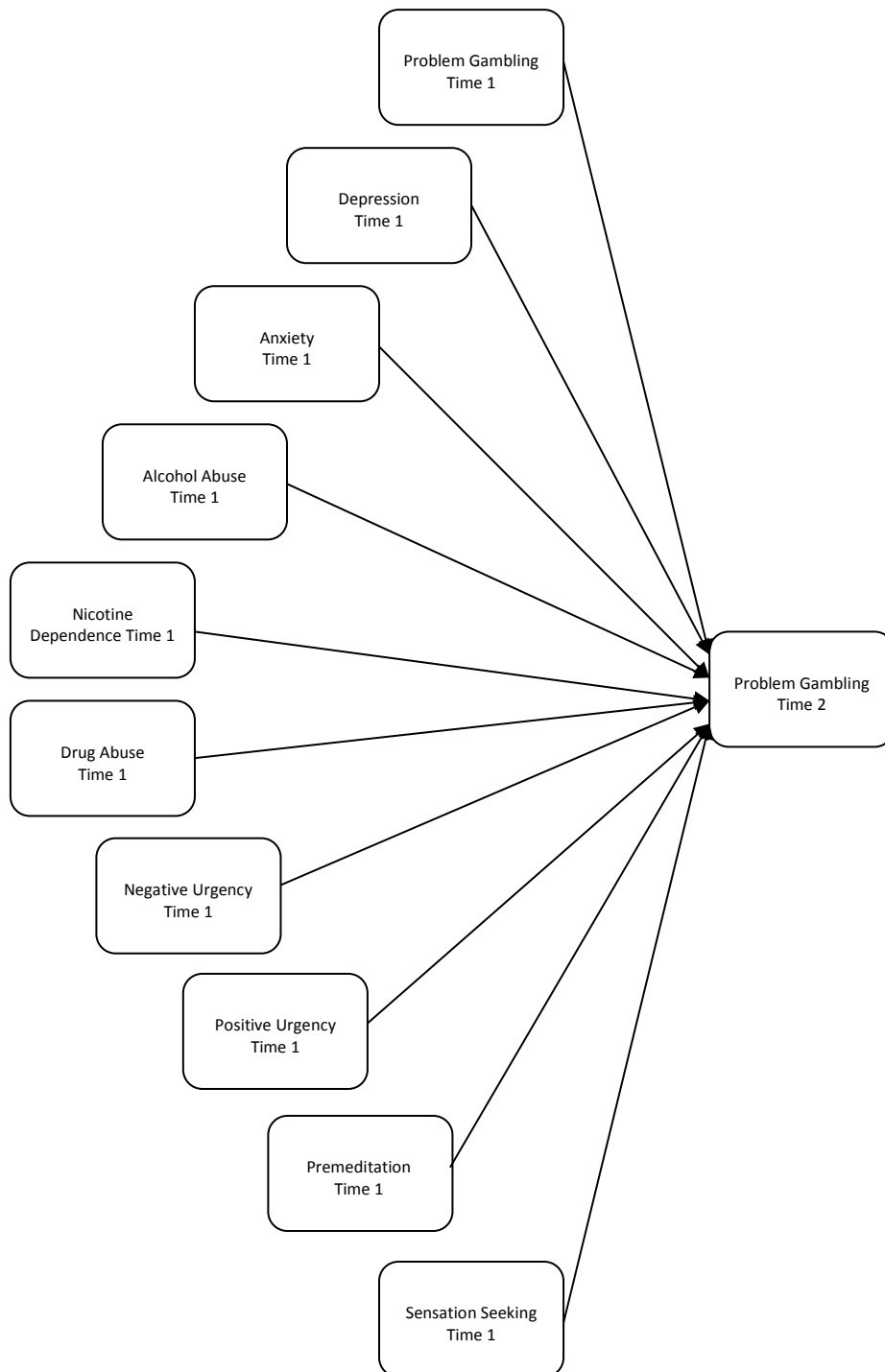


Figure 6-3- Conceptual model to assess relative strength and significance of co-morbid conditions present at Time 1 as predictors of problem gambling at Time 2

6.7.1 Model specification, estimation and fit

Building upon the previous model, the only change in the measurement part was that item 5 of the DAST was causing the model estimation to fail. When this single indicator variable was removed, the model was estimated successfully. However, this now left drug abuse at Time 1 to be estimated only by four indicators (items 3, 4, 8 and 10) as the other indicators (items 1, 2, 6 and 9) had previously been identified as problem variables and removed to facilitate overall structural modelling. The estimated model was a good fit to the data, as indicated by a relative $\chi^2 = 1.24$, RMSEA = 0.023 (RMSEA 90%, CI = 0.021 - 0.025) and a CFI = .95.

6.7.2 Results

The regression estimates for the current model are provided in Table 6-11. The inclusion of the four impulsivity variables contributed significantly to the model, such that the model accounted for 85% of the variance in problem gambling at Time 2 (R-Square = 0.85). This was an improvement of around .30 over the model without the Impulsivity facets.

Once again the strongest predictor of problem gambling at Time 2 was problem gambling at Time 1. In fact it was an even stronger predictor with the inclusion of the impulsivity facets suggesting that impulsivity acts a suppressor variable for problem gambling at Time 1. That is, it eliminated some of the variance in Problem Gambling Time 1 (PGT1) that is irrelevant to the prediction of Problem Gambling Time 2 (PGT2), thereby providing a stronger relationship. Of the four impulsivity facets, it would appear that negative urgency is the most important of these. A similar sized coefficient as negative urgency was found for anxiety which was larger than the previous analysis without impulsivity. This is an interesting finding and highlights the interplay between emotions and behaviours. Negative urgency refers to the tendency to behave rashly or lose control when experiencing negative emotions. Problem gambling is characterised by a loss of control, anxiety is a negative emotion and the inclusion of negative urgency in the model does appear to have refined this relationship, by suppressing irrelevant variance, thereby allowing a stronger relationship between PGT1, anxiety and PGT2. However, the same pattern should occur for depression, another negative emotion but depression remained non-significant in both models. Subsequent analyses showed that depression and problem gambling have a lot of shared variance and once PGT1 is included in the model, depression is no longer a significant predictor of PGT2. Anxiety

was related to PGT1 but not as strongly as depression and its ability to uniquely predict PGT2 was enhanced once the gambler's level of negative urgency was included.

It was also interesting to note that there was no longer a significant independent effect of nicotine or drugs at Time 1 on problem gambling at Time 2. This is likely to be due to the inclusion of the significant impulsivity facet, negative urgency at Time 1, which appears to overlap with both nicotine and drugs at Time 1 and explains the same information (i.e. shared variance like the depression example above). Although there was a slight change in the measurement of drug abuse with the removal of item 5 from the DAST this was not found to be responsible for drug abuse no longer achieving significance.²

However, overall, after problem gambling at Time 1 had been taken into account, variables such as anxiety, alcohol abuse and negative urgency were only weakly related to problem gambling at Time 2. The addition of impulsivity in the model does show how personality can interplay with mood disorders and substance abuse disorders in the prediction of problem gambling, but these variables were not strong unique predictors once current levels of problem gambling had been controlled.

² To assess the impact of item 5 on the previous model, that model was re-run deleting Drug5. The size and significance of the regression of PGT2 on drugs at T1 was not significantly impacted by the deletion of the variable (0.215, $p = 0.05$ without Drug5 in the measurement model versus 0.238, $p = 0.02$ including Drug5 in the measurement model).

Table 6-11 - Mental health and impulsivity predictors of problem gambling at Time 2

	Standardised Coefficient
Problem Gambling >>> Problem Gambling	0.86***
Depression >>> Problem Gambling	-0.04
Anxiety >>> Problem Gambling	0.11***
Alcohol Abuse >>> Problem Gambling	-0.09**
Nicotine Dependence >>> Problem Gambling	0.00
Drug Abuse >>> Problem Gambling	-0.04
Negative Urgency >>> Problem Gambling	0.11*
Positive Urgency >>> Problem Gambling	-0.03
Premeditation >>> Problem Gambling	0.04
Sensation Seeking >>> Problem Gambling	0.03

*p < .05, **p<.01, ***p<.001

6.8 Conclusion - Predicting problem gambling

The previous two analyses attempted to answer the question “Does the presence of a particular morbid condition or series of co-morbidities predict the development or presence of problem gambling”. The results indicated that the presence of the mood disorder anxiety, coupled with the personality trait of negative urgency can predict elevated problem gambling scores 12 months later in a group of regular gamblers. This was regardless of their current level of problem gambling but the effect was weak for both predictors. It was also found that elevated alcohol use predicted lower problem gambling scores 12 months later. This was again a weak relationship and may be due to the time and money associated with problem gambling limiting a gambler’s ability to fund other activities, such as heavy drinking.

The current study also found a host of variables that were not significant predictors of the development of problem gambling 12 months later. These included depression, nicotine dependence, drug abuse and the impulsivity facets of positive urgency, (lack of) premeditation and sensation seeking. However, the relationship between psychological variables and problem gambling is extremely volatile and the inclusion of other psychological predictors (e.g., coping style) may see a decrease or increase in the ability of variables to predict future problem gambling.

Chapter 7 Expert Interviews

7.1 Introduction

The intention of this stage of the research was to discuss the predictors of problem gambling with a range of experts in order to address the second research objective related to public health strategies. It was the results of the previous chapter that were most relevant here as the other analyses were more concerned with the temporal relationship between conditions rather than identifying a disorder as a predictor of problem gambling. Eighteen mental health and gambling help experts, including mental health service and gambling help service directors, co-ordinators and managers, participated. Some participants focused their responses on gambling problems while others mostly considered other co-occurring mental health disorders. This was consistent with the relative specialisation of these experts. Participants in both sectors emphasised that treatment often involved looking at a range of problems and complex needs.

A letter providing background information about the study was emailed to potential participants along with an information sheet, a brief summary of the results and background information about the study, and a consent form inviting participation in a telephone interview. These participants were recruited from all states and territories.

The telephone interviews averaged 30 - 45 minutes each. With participants' consent, the interviews were digitally recorded and transcribed by a professional transcription service. Participants were assured that only the researchers involved in the study would handle the information provided and all information would remain anonymous and confidential. As with the other qualitative stages, thematic data analysis was used (Attride-Sterling, 2001).

7.2 Summary of study results provided to participants

Participants were advised, prior to the interview being conducted, that the results were based on analysis of a study that:

... randomly recruited 455 adults from every State and Territory in Australia who had gambled at least fortnightly on EGMs, horse racing or casino games in the past year. Participants were tested twice, 12 months apart, to measure problem gambling, anxiety, alcohol use, nicotine use, drug use and four types of impulsivity.

Key results of that study included that:

- *Regular gamblers who have trouble controlling their impulsivity when in a negative mood (e.g., depressed, stressed) had higher problem gambling scores 12 months later.*
- *Regular gamblers experiencing anxiety had higher problem gambling scores 12 months later.*
- *Regular gamblers with greater alcohol use had lower problem gambling scores 12 months later.*

These experts were then asked to provide advice 'on the best public health strategies for use in the mental health and addiction sectors to assist with the prevention, early intervention and treatment of gambling problems'. Particular areas they were asked to consider included the implications of these findings for:

- Screening and diagnosis
- Treatment services, e.g. integration, delivery, partnerships, collaboration
- Community education and health promotion
- Training and professional development of service providers
- Future policy priorities.
- Future research priorities

The list of key results identified in the study was discussed in the context of each participant's expert knowledge. The interviews generally followed the topic structure outlined above and in the summary provided to the participants.

7.2.1 First key result

Regular gamblers who have trouble controlling their impulsivity when in a negative mood (e.g., depressed, stressed) had higher problem gambling scores 12 months later.

All participants agreed they were 'not surprised' by this result. For example, one expert participant said: 'This often happens for the clients I have seen. When someone is in a negative mood, they're feeling depressed, they'll often gamble more', while others alluded to the temporal sequencing of this behaviour, 'gambling tends to quieten down their thoughts and gambling keeps people busy if they are going through a manic stage.'

When people are feeling down they tend to gamble more. Gambling is only one of the symptoms people may have with a range of co-morbid problems. There may also be a range of underlying issues, relationship problems and other addictions.

This is consistent with other literature that has shown that when people are stressed, or depressed, or anxious they gamble more, or they drink more.

7.2.2 Second key result

Regular gamblers experiencing anxiety had higher problem gambling scores 12 months later.

As with the first key result, participants unanimously believed that for people who gamble, anxiety impacted on their level of gambling. Several participants noted that *'anxiety and gambling often go hand-in-hand'*.

Others said:

People tend to gamble to escape the stress of their lives and the anxiety from that. The stress of not having money and everything that goes along with that.

Sometimes people aren't aware of other problems, the co-morbid problems. With anxiety, people use gambling to feel better for awhile and to escape their problems.

Again, this is not surprising and supports other literature about co-occurring disorders including anxiety.

We're certainly aware of co-morbidities and often we find that gambling is only a symptom of something else happening in a person's life. So there often is anxiety.

In my experience I've found that gamblers with co-morbid depression, once the gambling's been treated there's a real improvement in the depression. However, with anxiety disorders, the anxiety seems to remain even though the gambling behaviour may have resolved. The anxiety disorder really needs to be targeted as well.

7.2.3 Third key result

Regular gamblers with greater alcohol use had lower problem gambling scores 12 months later.

Unlike the first and second key result most participants expressed surprise at this result. For instance, one participant said *'This doesn't gel with my experience of the clients I have seen.'* However, others proffered reasons for this result. Around a quarter

of the participants discussed the result as being influenced 'by what the primary problem is and whether it's the gambling or the alcohol that is the main concern for the client.' As another participant stated:

It depends which is the dominant behaviour, which is the dominant problem. People go through different cycles; sometimes they use alcohol and sometimes they use gambling.

Two participants suggested that the findings could be the result of limited resources, as 'people may be spending their money on alcohol and not gambling. So they're feeling more cashed up because they're not gambling.' 'Alcohol breaks down people's inhibitions' said another, adding that 'the effects of alcohol have reduced other issues of concern in their lives.'

This inability to identify gambling as a problem when experiencing an alcohol use disorder was explained by another participant as common:

It's a rare case when someone presents with an alcohol use problem. Some of our clients have had problems with alcohol in the past but it's not a current problem for them. They've often swapped one problem for another, swapped the alcohol for gambling.

One participant explained that the result highlights the need for 'greater integration with drug and alcohol help services and gambling help services' which is an area that is addressed further within the discussion identifying public health strategies.

7.3 Public health strategies

Participants were then asked:

Given these findings we would like to ask your advice on the best public health strategies for use in the mental health and addiction sectors to assist with the prevention, early intervention and treatment of gambling problems.

Responses were provided for the implications of the main findings for six key areas: screening and diagnosis; treatment services; community education and health promotion; training and professional development of service providers; future policy priorities; and future research priorities. Each of these is discussed below.

7.3.1 Screening and diagnosis

Participants spoke about the various tools and strategies they use for screening and diagnosis of gambling problems, as well as other underlying concerns. For gambling,

participants predominantly spoke about using the Problem Gambling Severity Index [PGSI] and the South Oaks Gambling Screen [SOGS] as the formal screens used. One participant explained:

We generally use the PGSI for gambling but we also ask about other problems the client may have, depression, anxiety, and alcohol.

Others said:

We use the Client Data Set and ask about a range of problems. First we ensure the client is feeling comfortable. But it's important to ask those questions early on in the counselling.

We work with the stages of change approach. We use timelines, discuss the impacts of gambling on the client and others, and look at the client's underlying core values.

I have found that using a simple likert scale and asking clients to rank their gambling is a useful tool.

The mental health experts mainly concerned with other co-occurring problems all said they asked about gambling, although not all used a specific screen. For instance, the following participants explained:

We don't necessarily use a screen as such. But we do ask about client's gambling behaviour.

It's important to ask about and screen for the range of disorders because they co-occur, and we include gambling in that.

The importance of asking about co-occurring disorders was raised by all participants. Some comments included:

In our service we use the DASS [Depression Anxiety Stress Scale] and also mainly ask a question like "Have you ever had a problem with alcohol?" And we ask about other mental illnesses and problems they may be experiencing.

We look beyond what is being presented, what the presenting symptom is and so we can look at what the underlying issues are. We ask them about what their needs are, what they want to achieve. For example, they may be grieving, feeling guilty and ashamed and there may be a range of issues.

One mental health expert said:

You learn more by talking to the person. Asking about the medication they are taking. What they want to gain out of the sessions.

Another said:

I very rarely use any screening, I just accept that the client has a gambling problem if they come in and see me. I learn more about the depth of their gambling by talking to them and getting the information that way.

Some of the participants spoke about the importance of gambling being raised by other health and welfare workers, particularly General Practitioners because '*gambling problems tend to go under the radar*'. This concern was raised by the following participant who explained:

When a patient presents to a GP with say depression, or anxiety I think the GP needs to ask a simple question about whether the person gambles. I think we need to have education for GPs and other health care workers about gambling and how it can become a problem for some people.

7.3.2 Treatment services

The need for services to work together, to refer between services and to build partnerships was an area that raised significant discussion by all participants. For instance, one respondent said: 'we need to have a joined up approach between services'. Other comments included:

It's about building networks between services. Having forums where information is shared. Interagency meetings where people talk about what their services offer. Those kinds of things that help services to build partnerships and provide information are useful.

We have established contacts with different areas of health and have a good working relationship with various services such as with a financial counsellor. We refer clients to different services and identify a path for clients to follow.

We do take a case management approach. We work with other organisations and we refer clients to other services if we think it is appropriate.

In the service where I work we have various services under one roof. We take a holistic approach.

One of the benefits of an integrated approach is the 'no wrong door' strategy. This also helps with early intervention measures.

7.3.3 Community education and health promotion

Participants spoke at length about the importance of community education and health promotion campaigns. For some of the participants this was an aspect of their professional role. For instance, the following participants said:

Part of my role is community education. We hold stalls at various events to raise awareness of gambling as a problem and how it isn't all about fun and how it can develop into a problem for some people. This needs to be made clear to the community.

We do some community education here. There is a need for a lot of education around counselling, what counselling is, what people can expect from counselling so people can feel comfortable and at ease. For a lot of people there is fear they will be expected to stop gambling. They think counselling is about someone telling them what they should do. But that doesn't work.

We at our service have made a DVD of a role play that provides information on problem gambling that we distribute.

The need for television campaigns to raise awareness of the problems that can be associated with gambling was emphasised by most of the participants. Some comments by participants included:

TV advertising. Not everyone reads newspapers. There needs to be an overarching television community campaign that is equitable across all geographical locations to highlight the problems associated with gambling problems. The stigma that is involved; How problem gambling can have detrimental effects on relationships, on families, on finances, crime, work, on so many aspects ... The more recognition about gambling problems the less it will be stigmatised.

We need to have serious ads on TV. We need to target families so they know what the indicators of problem gambling are because families will be more likely to act. There needs to be a holistic approach taken, one that recognises some of the indicators might be domestic violence, depression, anxiety, work problems. It's important that people know that if they contact a counselling service that something will happen.

TV campaigns is what is needed. Campaigns that are culturally appropriate for different cultural groups. That recognise the diversity of different groups and that target specific risk groups.

7.3.4 Training and professional development of service providers

The implication of the research findings on training and professional development for service providers elicited a mixed response from the expert participants. Some participants believed that current training was of a high-quality, while others discussed various gaps in current training practices. The following two participants were satisfied with current training practices:

Part of the training happens at various forums, at conferences, at meetings, these sorts of events. All of these forums are important for training, and just for keeping up-to-date with various research and

treatment, also to keep in touch with other people from other services as part of building networks.

We have a registered psychiatrist that we can contact. We have a rich support group of counsellors and we have on-going training that is funded through the Responsible Gambling Fund [RGF] where we can nominate the type of training we would like.

One participant called for 'a holistic approach to training ... that covers the whole gamut of areas that clients present with', while another gave an example of how their service does this, by providing 'workshops about aspects of problem gambling where various services are invited to attend, GPs, Red Cross, Centrelink, police etc.' Similarly, a need for 'more mental health professionals be trained specifically in the treatment of gambling related problems' was highlighted, and that training should recognise prior learning.'

A key issue raised by many of the participants was that GPs be trained in identifying people who may be experiencing gambling problems. The following participant explained:

It's important that GPs are educated that people might be having problems with gambling. They might present with depression, anxiety, and the gambling might be the underlying issue. They need to routinely ask about their patients gambling activities. Ask: Do they gamble? It's a useful strategy in the treatment setting.

Several participants spoke about the benefits of the Better Access Mental Health Initiative and how this assisted service providers to provide quality help. They spoke about how it has also made access to mental health therapists accessible for more people dealing with a range of co-occurring problems as noted by the following participant:

The Better Access Mental Health Initiative has seen good results. It has allowed greater access to psychologists, and people are confident that they will receive quality care, and for various problems.

Another participant spoke about a lack of awareness about the Better Access Mental Health Initiative:

Gambling help services need to be aware that clients can be referred back to their GP to get a Mental Health Care Plan and they can get 12 sessions with a psychologist. It's called the Better Access Program.

7.3.5 Future policy priorities

Various policy priorities were discussed by the expert participants. A key priority raised by the majority of participants concerned the advertising of gambling on television. For instance, participants said:

A definite priority is the removal of all gambling advertising from television including sports betting and internet gambling similar to the bans on cigarette advertisings.

The first thing is to not advertise gambling on television. We need to have a national television campaign addressing the dangers of gambling. The problems that gambling can create.

Support for integrated services was also identified as a policy priority as acknowledged by one participant thus:

What is needed is an integrated approach across all co-occurring issues and portfolios. There needs to be a focus on co-morbidity and there needs to be a shared vision across all government sectors. Policy that incorporates gambling help services and strong links with mental health services.

Another participant said 'services need a psychologist that is funded. Or at least access to a psychiatrist.'

Financial concerns were identified by around a quarter of the participants including the need for 'mandatory control over finances for identified problem gamblers', while others spoke about increased funding for counselling positions as highlighted by the following participant who said there was 'Definitely [a need for] more funding for permanent counselling positions, including financial counselling.'

Some experts spoke about self-exclusion policy and how the enforcement of self-exclusion should be given priority. More broadly, the need to address problem gambling from a public health perspective was also raised by several participants including one who saw a need for '... problem gambling [to be] seen as being a priority and that it is viewed as part of public health, similar to alcohol and other drug abuse.' In addition to increased awareness a public health approach could help '... to address the stigma associated with gambling problems, for example, similar to other public health issues like the anti-smoking campaigns.'

A number of participants highlighted their concern about the issue of problem gambling having the greatest impact on people from lower socio-economic communities. These

experts broadly agreed that ‘policy needs to address the supply side of gambling products, especially EGMs, in relation to where most of the harm is, in lower socio-economic communities.’

Several participants raised concern about the lack of social activities, particularly for certain age groups, and believed that lack of social connection could contribute to problem gambling for some people:

We need to develop more places for people to go to socialise etc. rather than going to gambling venues. I know many of the older people go and play the pokies to just be around people because they are lonely.

While the majority viewed EGM gambling as the form of gambling with the most associated problems, one participant believed that it is important that government policy recognises that other forms of gambling can lead to problems:

When problem gambling is discussed in relation to policy it's almost always in relation to EGMs. But people have problems with many other forms of gambling too, races, internet and this needs to be recognised in policy.

One participant asserted that ‘there’s not much more governments can do to have an impact on problem gambling.’

7.3.6 Future research priorities

A variety of research priorities were also identified. A key priority raised by around a quarter of the participants concerned the need for ‘*more evidence based research*’ with the aim being that this can then guide effective policy. One participant suggested research that explored:

What measures have the greatest impact on addressing problem gambling - We need research that is based on evidence. For instance, research about specific program evaluations, best practices and so forth. We need research that is based on hard data that is evidence based.

Others highlighted the need for further research targeted at particular sub-groups of people, including Indigenous people, gender related research, research amongst prisoners and research concerning specific ages - young people, middle aged people and older people. Comments and suggestions included:

A research topic is - how can people making the transition from prison to the wider community be best supported?

Why do people gamble? Why do particular sub-groups of the population gamble? Especially on pokies. What is the attraction? What causes people to gamble, what are the reasons? Why do women gamble? Men? People of various ages ... What are the concerns for Indigenous people?

Several participants discussed the need for more research concerning the impact of gambling on partners and families of people with gambling problems. One participant commented that:

There has been very little research about families, the experiences that family members go through when a partner or a parent has a gambling problem. I think this is an important gap in the research.

A number of participants identified further co-morbid research as a priority, with one interviewee specifying research particularly concerning severe mental illnesses ‘... including psychosis and schizophrenia.’

As well as a policy priority, the issue of addressing loneliness and social isolation was raised by several participants as a research priority. For instance, one participant suggested that research explore ‘how can we as a society address the issue of loneliness and isolation - and how do these issues relate to people gambling due to loneliness and isolation?’

Other research priorities identified by participants included longitudinal studies, measuring gambling behaviour ‘in household surveys and the Census data’, and ‘research that looks at strategies to engage help-seeking for people with gambling.’ Assistance for those who have sought help particularly related to finances and budgeting was also popularly proposed.

7.4 Discussion of results

In this section the results presented above are discussed according to the likely effectiveness of public health responses to problem gambling and mental health disorders.

7.4.1 Screening and diagnosis

In relation to screening and diagnosis many of the participants spoke about the role of GPs and other health care providers in identifying patients who have gambling problems. There was clear consensus that primary health care providers play a fundamental role in uncovering gambling problems early however, it was pointed out

that identifying people who have developed problems with gambling is frequently difficult because there are often no apparent or obvious symptoms.

Antonetti and Horn (2001:3) have called for 'targeted strategies ... to encourage early disclosure by clients' in recognition that early diagnosis of gambling problems is important for effective treatment. One such strategy would include that routine screening for gambling problems be conducted by various service providers including GPs and other primary health care providers (Antonetti & Horn, 2001). Rowan and Galasso (2000) point out that GPs are in a good position to provide the early identification of people experiencing gambling problems. However, as noted by Tolchard, Thomas and Battersby (2007:501):

Gambling is not an issue that most GPs consider when consulting with patients about depression, anxiety or non-specific health concerns. However, it is likely that patients presenting with such symptoms, and social or relationship problems, may also have a gambling problem that is causing or exacerbating the symptoms.

Participants spoke about easy to use screening tools that could be used by service providers such as the South Oaks Gambling Screen (SOGS); the Eight Screen (8-Screen); the Canadian Problem Gambling Index (CPGI) and in particular the Problem Gambling Severity Index (PGSI) component. One participant discussed identifying a person's level of gambling activity by 'using a simple likert scale and asking them to rank their gambling'. Another suggested utilising the public health approach and asking people to 'rate their level of gambling behaviour on the gambling continuum ranging from no risk to a great deal of risk'.

Similarly, several other participants spoke about screening and the importance of early diagnosis of gambling problems from a public health perspective for early intervention and how this approach highlights people who may be at-risk of a gambling problem. This sentiment concurs with Shaffer and Korn's (2002) approach of considering gambling as a continuum and how this is useful for recognising people who are beginning to gamble problematically so they are able to moderate their gambling behaviour early. Furthermore, Lepper and Creigh-Tyte (2006) have noted that a public health perspective encourages informed choice through the dissemination of information which discourages excessive gambling while making sure that the enjoyment of recreational gamblers is not affected.

7.4.2 Treatment services: Integration, partnerships and collaboration

Integration, partnerships and collaboration of services elicited considerable discussion from participants. Participants spoke about the usefulness of utilising an integrated approach within health services dealing with people experiencing gambling problems, as well as services for mental illness, substance abuse, unemployment, legal issues, financial counselling, primary health, police and so forth. The importance of dealing with a range of issues was a key theme raised and participants spoke about the value of building networks between services that assist people with a range of problems. The Productivity Commission (2010) noted that better collaboration between problem gambling services and other health and community services is important when providing intervention and treatment options for people with gambling problems because people who have problems with gambling often present to help services with multiple and complex needs. For instance, present estimates suggest that between 60 - 80 per cent of people with gambling problems experience significant depression, anxiety disorders and suicide ideation (Delfabbro, 2009). In addition, approximately 15 - 20 per cent of people experiencing gambling problems are estimated to be affected by substance abuse (Delfabbro, 2009).

Many participants said that the services in which they work already use a collaborative approach, at least to some extent, and that this has proven beneficial to treatment planning. This concurs with other research concerned with collaborative linkages and partnerships between services. For example, Fuller et al. (2011) argue that effective intervention strategies and treatment planning appear to benefit from a more integrated approach between service providers.

Two participants spoke about the 'Stepped Care Model' and how this is effective in providing care structures. Similarly, the South Australian Social Inclusion Board (2007) recommended the need for a range of recovery-focussed community based linkages as part of an integrated solution. Stepped Care is defined as:

A service system that is organised as a range of steps from the least intensive to the most intensive. The system is balanced by ensuring there is sufficient capacity at each of the less intensive service steps so as to limit the need for more intensive options (South Australian Social Inclusion Board, 2007:97).

Another participant discussed the 'No Wrong Door' approach which is focussed on therapists and counsellors gaining knowledge, learning new skills and consolidating current skills, as well as building relationships across the sectors (Proudfoot, Teesson,

Brewin & Gournay, 2003). Clients who present at a service are provided care across a range of health and social needs which can also require services to facilitate access to service delivery that falls beyond their specific focus (Proudfoot et al., 2003). The 'No Wrong Door' approach is premised on the principle that:

Every door in the health care system should be the "right" door. Each provider within it has a responsibility to address the range of client needs wherever and whenever a client presents for care. When clients appear at a facility that is not qualified to provide some type of needed service, those clients should carefully be guided to appropriate, cooperating facilities, with follow-up by staff to ensure that clients receive proper care (Department of Human Services, 2006:13).

7.4.3 Community education and health promotion

Many of the expert participants identified community education as being an important aspect of their professional role. Several specifically spoke about the importance of a holistic approach to community education and health promotion by incorporating various strategies, including a public health approach. In the literature, McLeroy et al., (1988) have similarly stressed the importance of utilising a range of approaches within health promotion campaigns in response to the complexity of issues people commonly face. Targeting only one behaviour or concern, without also targeting other issues, will not have as great an impact on health status (Hawkins & Catalano, 1992; Stokols, 1992).

In relation to integrating a public health approach to community education and health promotion, current public health promotion research highlights the need for a holistic approach to prevention, early diagnosis and harm minimisation strategies (Derevensky & Gupta, 2007; Sheedy, 2006). Such public health strategies include primary, secondary and tertiary interventions (Derevensky & Gupta, 2007). Primary interventions are those designed to prevent the development of gambling problems and include community education campaigns, changes to gambling advertising, the provision of safe-gambling messages, or the removal of gambling inducements. Secondary interventions assist gamblers once they are exposed to gambling (for example, in venues) and include restricting the accessibility of gambling, strategies to encourage greater awareness of gambling expenditure, social policies, modifications to gaming machines, and interventions involving assistance from staff at gambling venues. Tertiary interventions involve treating people with gambling problems, such as through counselling (Delfabbro & LeCouteur, 2003).

Culturally appropriate campaigns were a key area discussed in the interviews. It was noted that mainstream advertising may not suit the cultural needs of different cultural groups and included concerns over language barriers. In multicultural societies such as Australia, non-Caucasian ethnicity has been reported as a risk factor for gambling-related harm (Cultural Perspectives, 2005; McMillen, Marshall, Murphy, Lorenzen & Waugh, 2004; Productivity Commission, 2010; Stevens, Golebiowske, & Morrison, 2010). The Productivity Commission (2010) suggested that cultural differences can affect how gambling and gambling help are perceived. This point has also been made in New Zealand by Bellringer, Pulford, Abbott, DeSouza and Clarke (2008) who recommended greater Maori involvement in raising awareness of help services and destigmatising help-seeking behaviour, along with greater involvement in the design and provision of services.

Despite this growing awareness that well designed community education and health promotion campaigns can be effective, people may not identify gambling problems even when gambling-related harm is impacting their lives, as well as the lives of their families (McMillen & Bellew, 2001; McMillen et al., 2004). This was a point raised by participants in this current study in relation to campaigns that identify the indicators of problem gambling where the need for well-informed public health promotion and community education for gambling help access for all groups in society was highlighted. It was also noted that there is often a lack of awareness about services and what services can offer generally and that shame, guilt and stigma can stop people accessing services. The Aboriginal Health and Medical Research Council (2007) similarly note that that shame and stigma can prevent people seeking gambling and related help. Participants stressed the need for educational campaigns to address the shame and stigma associated with gambling problems and to highlight what counselling is and what people can expect from counselling.

7.4.4 Training and professional development of service providers

Participants who mainly assist people with a range of mental health concerns spoke about the importance of on-going training provided for counsellors and psychologists. Several spoke about the Better Access Mental Health Initiative that provides subsidised mental health care under the Mental Health Care Plan. For registered psychologists Continuing Professional Development (CPD) is required. The introduction of mandatory CPD was introduced in the 2009-10 Budget as a condition for registered psychologists and social workers providing Focussed Psychological Strategies (FPS) services under

the Better Access Mental Health Initiative. The initiative was designed to ensure that Commonwealth-funded mental health services are of a 'suitably high quality' and to ensure 'consistency in the quality of services provided by all providers of FPS services' (Department of Health & Ageing, 2011:2).

Several of the problem gambling counsellors and co-ordinators spoke about the on-going support for clinical supervision they or their staff receive. According to the Responsible Gambling Fund [RGF] (2008:4) 'clinical supervision is an essential tool in ensuring the provision of professional treatment services'. It occurs when a counsellor and supervisor meet regularly to examine the counsellor's work with clients (RGF, 2008). Several participants spoke specifically about the benefits they get from the continuing support of psychiatrists.

Several participants also discussed the support they get from fellow counsellors. This support was seen as important for keeping up-to-date with current research and treatment strategies. According to Mead and MacNeil (2006) peer support occurs when people provide knowledge, experience, and emotional, social or practical help to each other. Peer support is also used to refer to initiatives where colleagues, members of self help organisations and others meet as equals to give each other support on a reciprocal basis. Participants in this current study also spoke about peer support occurring as part of training and professional development workshops, and at various forums and conferences.

7.4.5 Future policy priorities

A diversity of future policy priorities were discussed by participants. While many of the responses were wide ranging, most participants highlighted the need for additional funding for permanent counselling positions, including financial counselling. In addition, most discussed how problem gambling needs to be seen as a priority by governments and recommended that problem gambling be viewed as part of public health, similar to alcohol and other drug abuse. It was agreed that there be a complete ban on all gambling advertising on television including sports betting and internet gambling and that there be intensive government campaigns to address gambling concerns to highlight the harms involved when gambling becomes a problem, not only for the person experiencing the gambling problem, but also to families, to communities, to employers and to wider social networks.

Several participants discussed the role of gambling venues as a place for people to go to alleviate social isolation and loneliness, and the need for alternative places for people to go. This concern was similarly discussed by Holdsworth, Nuske and Breen (2011) who found that many of the women in their study who were experiencing problems with gambling also spoke about loneliness and social isolation.

A number of participants highlighted their concern about the disproportionate impact of problem gambling on people from low socio-economic communities. One considered that 'policy needs to address the supply side of gambling products, especially EGMs, in relation to where most of the harm is, in lower socio-economic communities'. Research has revealed that it is those who are least able to afford gambling related losses that are often most affected, and while people from all socio-economic backgrounds can develop gambling problems, problem gamblers on low incomes experience losses disproportionately (Brown & Coventry, 1997; Evans & Delfabbro, 2005; Livingstone & Adams, 2010; Shaffer & Korn, 2002). There are greater financial demands and less financial buffers for those with fewer resources.

7.4.6 Future research priorities

Participants identified various important research gaps including the need for more research into particular sub-groups such as specific cultural groups, various age groups, gendered research, the prison population, people with severe mental illness, people from low socio-economic communities, and research concerned with the impact of problem gambling on partners and families. Other research priorities included studies concerned with financial issues such as budgeting, addressing loneliness and isolation experienced by people with gambling problems, and greater concentration on longitudinal studies. Many of these areas have likewise been identified in the gambling related literature as research gaps (for example, Hing & Breen, 2001; Holdsworth, Nuske & Breen, 2011; Holdsworth, Haw & Hing, 2011; McMillen et al., 2004; Patford, 2008, 2009; Piquette-Tomei et al., 2008; Productivity Commission, 2010; Raylu & Oei, 2004; Shaffer & Korn 2002; Thomas & Jackson, 2008).

Using evidence based research to guide future policy development was emphasised by many participants. This echoes the sentiment of the Productivity Commission (2010:18.2) who have noted that a 'scarcity of policy relevant evidence' that has 'constrained the scope to design more effective and efficient regulations'. In a submission by Relationships Australia (SA) (sub. 203:10) to the Productivity Commission (2010:18.3) it was stated that:

There is a dire lack of research regarding the effectiveness of different types of interventions with problem gamblers ... This includes little or no research/evaluation of telephone counselling, the self-exclusion process, venue-level and machine-based interventions, cultural differences in gambling ... and the link between counselling outcomes and counselling processes.

Factors confounding effective research, especially the issue of trusting what participants say, were of concern to two expert interviewees. They pointed out that before people are willing to open up and tell the truth about personal aspects of their lives there is a need to build rapport and trust between the participant and the researcher. As one stated:

Sometimes I wonder just how truthful people are when they are being interviewed for research. Sometimes when I read these studies I'm wondering why the information isn't similar to my experiences of people who I have counselled.

Relationships between the researcher and the participant can be constrained by their limited interactions, and according to Judd et al. (2004) it can take months to build the kind of rapport and trust that encourages disclosure of more private or difficult information. Nevertheless, some researchers have argued that this can be overcome by showing empathy through careful listening, being non-judgemental and respectful, asking open-ended questions, and allowing space for people to tell their stories (Reinharz, 1992). Rubin and Rubin (2005:2) have similarly noted that trust and rapport can be built in the research process through 'talking with, and listening carefully to, the people who are being researched'.

7.5 Summary of expert findings

Participants' comments concurred with the first and second key results of this study: regular gamblers who have trouble controlling their impulsivity when in a negative mood (e.g., depressed, stressed) had higher problem gambling scores 12 months later; and regular gamblers experiencing anxiety had higher problem gambling scores 12 months later. However, participants' responses about the third key result: regular gamblers with greater alcohol use had lower problem gambling scores 12 months later, were mixed. While the majority expressed surprise and noted that this result did not match their experiences of assisting their clients, others provided some possible explanations. For instance, several participants explained the result as being whether the primary concern is the gambling behaviour or the alcohol abuse. Others explained this result by noting that clients' problems are often cyclical; sometimes they are having

problems with gambling and at other times they are having problems with alcohol abuse.

Expert participants discussed various screening and diagnosis tools that are used including the Problem Gambling Severity Index [PGSI] and the South Oaks Gambling Screen [SOGS]. Others suggested that it is more useful to 'just ask the question'. The participants who mainly assist people experiencing gambling problems said they ask clients about co-occurring problems including depression, anxiety disorders and alcohol abuse. Some use screens such as the Depression Anxiety Stress Scales [DASS] and the Client Data Set [CDS], while others asserted that 'you learn more by talking to the person'. The participants who mainly assist people with co-occurring mental health and related concerns noted that gambling problems get asked about, however, generally this is through broad discussion with clients. Participants said that it is important that gambling is asked about by other health and welfare workers because 'gambling problems tend to go under the radar'. It was highlighted that it is especially important that GPs ask about gambling problems when patients present with symptoms of depression and anxiety.

Participants were in agreement that it is beneficial for services to work together, and many noted that this is already happening to various degrees. Some noted that the services in which they work have various services 'under one roof', such as financial counselling and relationship counselling.

Many participants noted that their roles involve community education and health promotion activities. This was considered to be important in order to alleviate concerns about approaching counselling services, as well as to educate the public about the indicators of problematic gambling behaviour. It was considered especially important that there be television campaigns to inform people that gambling can become a problem for some people, and that many people are affected by harmful gambling including partners, children, friends, work colleagues and employers, and members of the wider community. Such campaigns would also help to address the stigma that is associated with gambling problems.

The adequacy of training and professional development of service providers elicited mixed responses, with some participants asserting that current training was of high quality while others identified gaps in current training practices. Some stressed the importance of taking 'a holistic approach to training', including areas that commonly go

hand-in-hand with gambling problems such as co-occurring mental health concerns and relationship issues.

Participants highlighted a range of future policy priorities including: more funding for permanent counselling positions, especially financial counselling; the removal of gambling advertising from television including sports betting and internet gambling, raising the profile of problem gambling so it is seen as a public health priority, similar to alcohol and other drug abuse. One participant believed that not much more could be done by governments.

Various research priorities were also identified including: research addressing budgeting by gamblers; the impact of gambling on partners and families of people with gambling problems; issues of loneliness and isolation; measures that have the greatest impact on addressing problem gambling; evidence based research that can guide effective policy; gender related research; research concerning particular sub groups including people from various cultural groups, people of various ages - younger people and older people, as well as people from low socio-economic communities; research in prisons; more co-morbid research on problem gambling co-occurring with severe mental illnesses including psychosis and schizophrenia; and emphasis on longitudinal studies.

Chapter 8 Report Summary

The evidence suggesting a temporal relationship between many mental health co-morbidities and problem gambling is mixed. For example, rates of alcohol dependence, smoking and other drug use have been found to be significantly higher in problem gamblers than in the general population. In addition, there is strong evidence to suggest that problem gamblers have increased rates of mental disorders, including depression, suicide ideation and anxiety disorders. The issue of ascertaining the temporal relationship between problem gambling and co-occurring disorders is, therefore, an important one. By understanding the connection between problem gambling and co-morbidities in the general population, as well as within subgroups and treatment samples, better treatment and harm minimisation strategies, as well as useful and appropriate policies, can be developed.

This research was commissioned by Gambling Research Australia in order that the key co-morbidities complicit in the development and maintenance of problem gambling could be explored and appropriate public health strategies considered. Using a sequential, mixed methods research design and sampling from a range of participants including: counsellors and therapists from gambling and mental health services; gamblers in counselling; regular gamblers in the community and public health experts, a picture of the temporal relationship between significant disorders and problem gambling was able to be established.

Qualitative data was analysed thematically and the results retested on increasingly specialised samples of clinicians. These findings informed the design of the CATI questionnaire administered to gamblers in treatment (N=267) and regular gamblers (N=620) in the community. A key feature of the community survey was a second (Time 2), longitudinal stage of data collection (N=455) that occurred approximately 12 months after the Time 1 survey.

While the researchers were able to survey a greater number of participants at Time 2 than originally intended, there were some limitations in terms of the under-representation of problem gamblers in this second round of data collection that required weighting of the data at the analysis stage. Nonetheless, a large and robust sample of respondents was obtained and the results of the quantitative analyses were able to be discussed with the public health experts (N=18) interviewed in Stage 6 of the project.

The study aimed to answer two broad research questions.

What is the temporal relationship between problem gambling and other co-occurring disorders?

Does the presence of a particular morbid condition or a series of co-morbidities predict the development or presence of problem gambling? If so, provide advice on the best public health strategies for use in the mental health and addiction sectors.

With regard to the first question it was found that mental health professionals such as problem gambling counsellors suggested that the sequence is inconsistent across individuals. That is, from their clinical experience they have found that some people develop problem gambling first and others develop problem gambling after experiencing depression, anxiety, alcohol abuse, nicotine dependence or drug abuse. The research that followed largely agreed with this, however, there were some temporal relationships identified with some disorders.

From the survey of problem gamblers in treatment it must be remembered that not all reported experiencing another disorder. Depression and anxiety were experienced by over 80%, however, nicotine dependence was experienced by around 50% of participants and alcohol abuse and drug abuse was experienced by around 30% of participants. Of those who had experienced another disorder it was found that gender differences existed in the age of **first onset** for the disorders tested. The most striking feature of this analysis was the very late onset of problem gambling for women compared to men. From these data, it would appear that for women the first onset of problem gambling occurs **after** the first onset of the other disorders tested. For men, there was no such distinct pattern with the average age of first onset for problem gambling being close to that for depression and anxiety, but after alcohol use, nicotine dependence and drug abuse. All of these disorders tended to occur, for men, in their twenties. The age of first onset analysis was also performed on the community sample of regular gamblers. The results showed a very similar pattern to the treatment sample adding support to these conclusions regarding the temporal sequence of the first onset of problem gambling with other disorders.

However, the age of first onset analysis does not allow for any conclusions to be drawn about the relationship or connection between disorders. This was tested with longitudinal data from regular gamblers with a 12 month follow-up. The results suggested that for men no temporal relationship existed between problem gambling

and anxiety, nicotine dependence or drug abuse. However, for men, it was found that problem gambling came **before** elevated levels of depression and also **before** reduced levels of alcohol misuse. For women, problem gambling was not temporally related to depression, alcohol use, nicotine dependence or drug abuse. Problem gambling was, however, found to come **before** elevated levels of anxiety.

With regard to the second research question it was found that most morbid conditions do not predict problem gambling. These include depression, nicotine dependence, drug abuse and personality traits such as sensation seeking, positive urgency and lack of premeditation. However, it was found that a tendency to act impulsively under conditions of negative affect (negative urgency) and anxiety were positive predictors of problem gambling 12 months later. Either of these conditions alone predicted higher levels of problem gambling and it was not necessary for a gambler to experience both to have higher levels of problem gambling 12 months later. It was also found that alcohol misuse predicted lower levels of problem gambling in 12 months time.

Although the methodology employed has several strengths compared to other research in the area (utilising longitudinal data from regular gamblers) there were weaknesses with the execution of some stages of this methodology. First, the longitudinal sample was not a true random sample and this generated a differential attrition across the two time points. This limits the generalisability of the results. Second, the follow-up time period was only 12 months and this meant the study was looking for changes in problem gambling scores rather than the transition from non-problem gambling to problem gambling according to the PGSI classification. Tracking regular gamblers over 3 - 5 years would allow a better estimate of the role that co-morbid disorders play in causing problem gambling and the retrospective data suggest that there is often a large time-lag between the first onset of disorders. Finally, there were several statistical problems with the measures utilised, particularly with substance abuse and the resultant skewed distributions. Many of these problems could be reduced with a larger sample size.

The results of this study and its limitations were discussed within a public health framework with a panel of mental health experts with diverse specialities. These limitations included lower numbers of problem gamblers in the Time 2 sample as compared to the Time 1 sample, and low prevalence of several co-morbid disorders that prevented the application of several intended statistical tests.

There was agreement that further research was needed and some suggestions on how to assist the mental health sector. Strategies included greater public awareness of the relationship between these disorders and the concurrent resourcing of a range of treatment providers and counsellors to help understand and identify the disorders. These may include access to specialists such as psychologists or psychiatrists along with increased training in co-morbid disorders.

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Appendix A: Stage 3 Treatment Sample Questionnaire

Gambling and psychology

This study is the initiative of Gambling Research Australia and is funded by each State and Territory government in Australia. The following questionnaire is administered by the Centre for Gambling Education and Research at Southern Cross University, Lismore, New South Wales.

The purpose of this study is to examine gambling problems and other mental health issues that people can have. The results will help improve treatment services and lead to a greater understanding of the issues around problem gambling. If you complete this survey, please be assured that only the researchers will handle the information.

Your individual responses to the survey will remain anonymous and confidential. Your information will be combined with that from other respondents. A research report on the results will be provided to Gambling Research Australia and available on their website at a later date.

The survey should take you around 15 minutes to complete.

As a thank you for your time in completing the questionnaire, we will reimburse you with a \$20 StarCash voucher redeemable for petrol or goods at any Caltex outlet in Australia. At the end of the survey, you will be asked to write a name and postal address in order to receive the voucher. The voucher will be sent out by an administrative person who does not have access to the data and it will not contain any information that links you with this specific study.

If any unwelcome issues about gambling arise while you are completing the survey, you should consider terminating the questionnaire and speaking to a counsellor or contacting the National Gambling Helpline (ph. 1800 858 858).

If you have any questions about this project, feel free to ask the project coordinator Professor Nerilee Hing Centre for Gambling Education and Research School of Tourism and Hospitality Management Southern Cross University Email: nerilee.hing@scu.edu.au ph. 02 6620 3928 fax 02 6620 3565 The ethical aspects of this study have been approved by the Southern Cross University Human Research Ethics Committee (HREC). The Approval Number is 09-110. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the HREC through the Ethics Complaints Officer, telephone [02] 6626 9139, fax [02] 6626 9145. Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

Section A: First we need to ask some basic questions that describe you.

1. What is your gender? Female Male
2. What is your age? _____ years
3. What is the postcode of your usual residential address? _____

Many of the following questions ask you to identify how old you were when certain events took place in your life. Please take your time thinking about this and try to be as accurate as possible.

Section B: Next, we would like you to answer some questions about problem gambling.

Problem gambling is characterised by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community.

These adverse consequences may include frequent financial problems, health problems such as stress and anxiety, or relationship issues.

1. Thinking about this definition, at what age were you when you first experienced difficulties with your gambling?

_____ years old

2. What was the main type of gambling associated with these problems (tick one box only)?

- Keno
- Casino games (e.g., roulette, card games)
- Racing (e.g., horse, greyhound)
- Gaming machines (e.g., poker machines)
- Sports betting (e.g., football, car racing)
- Bingo or Housie
- Lotto, Powerball, Tattslotto, Oz Lotto etc.
- Other _____

Thinking about that time in your life when you first experienced difficulties with gambling, please indicate how often each statement below applied to you at that time:

3. How often did you bet more than you could really afford to lose?

Never **Sometimes** **Most of the time** **Almost always**

4. How often did you need to gamble with larger amounts of money to get the same feeling of excitement?

- Never Sometimes Most of the time Almost always
5. How often did you go back another day to try to win back the money you lost?
- Never Sometimes Most of the time Almost always
6. How often did you borrow money or sell things to get money to gamble?
- Never Sometimes Most of the time Almost always
7. How often did you feel that you might have a problem with gambling?
- Never Sometimes Most of the time Almost always
8. How often did people criticise your betting or tell you that you had a gambling problem, regardless of whether or not you thought it was true?
- Never Sometimes Most of the time Almost always
9. How often did you feel guilty about the way you gambled, or what happened when you gambled?
- Never Sometimes Most of the time Almost always
10. How often did your gambling cause you any health problems, including stress or anxiety?
- Never Sometimes Most of the time Almost always
11. How often did your gambling cause financial problems for you or your household?
- Never Sometimes Most of the time Almost always
12. How often were you unable to resist the urge to gamble?
- Never Sometimes Most of the time Almost always
13. How often did you gamble more money than intended?
- Never Sometimes Most of the time Almost always
14. How often did you spend more time gambling than intended?
- Never Sometimes Most of the time Almost always

Section C: We would now like you to answer some questions about your mood.

A depressive disorder is characterised by persistent low mood, problems functioning with everyday activities and a reluctance to participate in activities that were once enjoyable.

Other symptoms of depression may include feeling down or sad for an extended period of time and feelings of worthlessness and hopelessness.

1. Thinking about this definition, how strongly would you agree that you have experienced a depressive disorder during your lifetime?

- Not at all** (please go to page 6 **Section D**)
- Somewhat Agree** (continue below)
- Strongly Agree** (continue below)

2. At what age were you when you first experienced a depressive disorder?

_____ years

3. Thinking about that time in your life when you first experienced a depressive disorder, please indicate how much each of the 7 statements below applied to you at that time.

Please **circle** your response using the following scale.

0 Did not apply to me at all.

1 Applied to me to some degree or some of the time.

2 Applied to me a considerable degree or a good part of the time.

3 Applied to me very much or most of the time

I felt downhearted and blue	0	1	2	3
I felt that I had nothing to look forward to	0	1	2	3
I felt that life was meaningless	0	1	2	3
I felt that I wasn't worth much as a person				
I was unable to become enthusiastic about anything	0	1	2	3
I couldn't seem to experience any positive feeling at all	0	1	2	3
I found it difficult to work up the initiative to do things	0	1	2	3

Section D: The following questions relate to your levels of anxiety.

Anxiety disorders are characterised by persistent feelings of panic, worry or fear along with tension. This can occur for no apparent reason and can continue long after a stressful situation has passed.

Other symptoms of anxiety may include, experiencing breathing difficulties, being aware of heart action in the absence of physical exertion, trembling, dryness of mouth and feeling scared for no good reason.

1. Thinking about this definition, how strongly would you agree that you have experienced an anxiety disorder during your lifetime?

Not at all (please go to page 7 **Section E**)

Somewhat Agree (continue below)

Strongly Agree (continue below)

2. At what age were you when you first experienced an anxiety disorder?

_____ years

3. Thinking about that time in your life when you first experienced an anxiety disorder, please indicate how much each of the 7 statements below applied to you at that time.

Please **circle** your response using the following scale.

0 Did not apply to me at all.

1 Applied to me to some degree or some of the time.

2 Applied to me a considerable degree or a good part of the time.

3 Applied to me very much or most of the time

I felt I was close to panic	0	1	2	3
I felt scared without any good reason	0	1	2	3
I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
I experienced trembling (e.g. in the hands)	0	1	2	3
I experience breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
I was aware of dryness of my mouth	0	1	2	3
I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0	1	2	3

Section E: The next set of questions refer to your use of alcohol.

An alcohol use disorder is characterised by tolerance to the effect of alcohol and also withdrawal symptoms when use is reduced or stopped. It may include repeated use of alcohol despite recurrent adverse consequences (e.g., failing to fulfil obligations, relationship issues).

Other symptoms of an alcohol use disorder may include repeated unsuccessful efforts to stop or lessen the alcohol use, a need for alcohol first thing after waking, and continued alcohol use despite negative health effects (physical or psychological).

1. Thinking about this definition, how strongly would you agree that you have had an alcohol use disorder during your lifetime?

- Not at all** (please go to page 9 **Section F**)
- Somewhat Agree** (continue below)
- Strongly Agree** (continue below)

2. At what age were you when you first experienced an alcohol use disorder?

_____ years

Thinking about that time in your life when you first experienced an alcohol use disorder, please indicate the response below that best reflects your drinking at that time.

3. How often did you have a drink containing alcohol?

- Monthly or less** **2-4 times a month** **2-3 times a week** **4 or more times a week**

4. How many standard drinks did you have on a typical day when you were drinking? (a standard drink is a glass of wine, shot of spirits, middy/pot of full strength beer. Larger portions such as stubbies, schooners are 1.5 standard drinks).

- 1 or 2** **3 to 4** **5 to 6** **7 to 9** **10 or more**

5. How often did you have six or more standard drinks on one occasion?
 Never **Less than monthly** **Monthly** **Weekly** **Daily or Almost Daily**
6. How often did you find you were not able to stop drinking once you had started?
 Never **Less than monthly** **Monthly** **Weekly** **Daily or Almost Daily**
7. How often did you fail to do what was normally expected of you because of your drinking.
 Never **Less than monthly** **Monthly** **Weekly** **Daily or Almost Daily**
8. How often did you need a first drink in the morning to get yourself going after a heavy drinking session?
 Never **Less than monthly** **Monthly** **Weekly** **Daily or Almost Daily**
9. How often did you have a feeling of guilt or remorse after drinking?
 Never **Less than monthly** **Monthly** **Weekly** **Daily or Almost Daily**
10. How often were you unable to remember what had happened the night before because you had been drinking?
 Never **Less than monthly** **Monthly** **Weekly** **Daily or Almost Daily**
11. Were you or someone else injured because of your drinking?
 No **Yes**
12. Was a relative, friend, doctor or other health care worker concerned about your drinking or suggested you cut down?
 No **Yes**

Section F: The next set of questions refer to your use of nicotine.

Nicotine dependence is characterised by tolerance to the effect of nicotine and also withdrawal symptoms when use is reduced or stopped. For most people, smoking is generally the main source of nicotine.

Other symptoms of nicotine dependence may include repeated unsuccessful efforts to stop or lessen the use of nicotine, a need for a cigarette first thing after waking, and continued cigarette use despite negative health effects (physical or psychological).

1. Thinking about this definition how strongly would you agree that you have experienced nicotine dependence during your lifetime?
- Not at all** (please go to page 10 **Section G**)
- Somewhat Agree** (continue below)
- Strongly Agree** (continue below)

2. At what age were you when you first experienced nicotine dependence?
3. _____ years

Thinking about that time in your life when you first experienced nicotine dependence, please answer the following questions in relation to your smoking at that time

4. How soon after you woke up would you smoke your first cigarette?
 Within 5 minutes **6-30 minutes** **31-60 minutes** **After 60 minutes**
5. Did you find it difficult to refrain from smoking in the places where it is forbidden (cinemas, airplanes, restaurants)?
 Yes **No**
6. Which cigarette would you hate most to give up?
 The first one in the morning **Any other**
7. How many cigarettes per day did you smoke?
 10 or less **11-20** **21-30** **31 or more**
8. Did you smoke more frequently during the first hours after waking than during the rest of the day?
 Yes **No**
9. Did you still smoke even if you were so ill that you were in bed most of the day?
 Yes **No**

Section G: The next set of questions refer to your use of substances other than alcohol or nicotine.

*A substance use disorder is characterised by tolerance to the effect of the substance and also withdrawal symptoms when use is reduced or stopped. It may also include repeated use of the substance despite **recurrent** adverse consequences (e.g., failing to fulfil obligations, relationship problems).*

Other symptoms of a substance use disorder may include repeated unsuccessful efforts to stop or lessen the substance use, a need for the substance first thing after waking, and continued substance use despite negative health effects (physical or psychological).

1. In relation to drugs (legal or illegal) **other than alcohol or nicotine**, how strongly do you agree that you have experienced a substance use disorder during your lifetime?
- Not at all** (please go to page 11 **Section H**)
- Somewhat Agree** (continue below)
- Strongly Agree** (continue below)
2. At what age were you when you first experienced this substance use disorder?
_____ years

3. Thinking about that time in your life when you first experienced problems from this drug use, please answer the following questions in relation to your use of this drug, at that time. **Circle** either **yes** or **no**.

Did you use drugs other than those required for medical reasons
Did you abuse more than one drug at a time?
Were you always able to stop using drugs when you wanted to?
Did you have “blackouts” or “flashbacks” as a result of drug use?
Did you ever feel bad or guilty about your drug use?
Did your spouse (or parent) ever complain about your involvement with drugs?
Did you neglect your family because of your use of drugs?
Did you engage in illegal activities in order to obtain drugs?
Did you ever experience withdrawal symptoms (felt sick) when you stopped taking drugs?
Did you have medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding etc...)?

Section H: The final section asks you to rate statements about you in general.

Please read each item carefully and indicate how strongly you agree or disagree with each statement using the following scale.

1 Agree Strongly

2 Agree Somewhat

3 Disagree Somewhat

4 Disagree Strongly

1. I have a reserved and cautious attitude toward life.
2. I have trouble controlling my impulses.
3. I generally seek new and exciting experiences and sensations.
4. When I am very happy, I can't seem to stop myself from doing things that can have bad consequences.
5. My thinking is usually careful and purposeful.
6. I have trouble resisting my cravings (for food, cigarettes, etc.).
7. I'll try anything once.
8. When I am in a great mood I tend to get into situations that could cause me problems.
9. I am not one of those people who blurt out things without thinking.
10. I often get involved in things I later wish I could get out of.
11. I like sports and games in which you have to choose your next move very quickly.
12. When I am very happy, I tend to do things that may cause problems in my life.
13. I like to stop and think things over before I do them.
14. When I feel bad, I will often do things I later regret in order to make myself feel better now.
15. I would enjoy water skiing.
16. I tend to lose control when I am in a great mood
17. I don't like to start a project until I know exactly how to proceed.
18. Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.
19. I quite enjoy taking risks.
20. When I am really ecstatic, I tend to get out of control.
21. I would enjoy parachute jumping.
22. I tend to value and follow a rational, "sensible" approach to things.
23. When I am upset I often act without thinking.
24. Others would say I make bad choices when I am extremely happy about something.
25. I welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.
26. I usually make up my mind through careful reasoning.

27. When I feel rejected, I will often say things that I later regret.
28. Others are shocked or worried about the things I do when I am feeling very excited.
29. I would like to learn to fly an airplane.
30. I am a cautious person.
31. It is hard for me to resist acting on my feelings.
32. I sometimes like doing things that are a bit frightening.
33. Before I get into a new situation I like to find out what to expect from it.
34. I often make matters worse because I act without thinking when I am upset.
35. When overjoyed, I feel like I can't stop myself from going overboard.
36. I would enjoy the sensation of skiing very fast down a high mountain slope.
37. I usually think carefully before doing anything.
38. Before making up my mind, I consider all the advantages and disadvantages.
39. When I am really excited, I tend not to think of the consequences of my actions.
40. In the heat of an argument, I will often say things that I later regret.
41. I would like to go scuba diving.
42. I tend to act without thinking when I am really excited.
43. I always keep my feelings under control.
44. When I am really happy, I often find myself in situations that I normally wouldn't be comfortable with.
45. I would enjoy fast driving.
46. When I am very happy, I feel like it is ok to give in to cravings or overindulge. Sometimes I do impulsive things that I later regret.
47. I am surprised at the things I do while in a great mood
48. When I get really happy about something, I tend to do things that can have bad consequences.

Thankyou for completing this survey.

If any unwelcome issues have arisen while you were completing this survey, you should consider speaking to a counsellor or contacting the National Gambling Helpline (ph. 1800 858 858).

To obtain your \$20 StarCash voucher, please email a name and address to cger@scu.edu.au and advise that you just completed the psychology study.

Thank you.

Appendix B: Stage 4 Community Sample Questionnaire

INTRODUCTION:

Good (...). My name is from Reark Research and at the moment we are talking to people around Australia who are 18 years or older about popular gambling activities.

SCREEN 1:

1. May I speak to the person in this household, who is 18 years or older and whose birthdate is closest to today's date. (*If necessary, arrange time for call-back*)
2. IF LOOKING FOR QUOTA: May I speak to the (..man/woman..) in this household, who is 18 years or older and whose birthdate is closest to today's date. (*If necessary, arrange time for call-back*)
3. IF QUOTA FULL: Thank you but unfortunately our quota is now full. Thank you for your time anyway."

PROCEED WITH SELECTED RESPONDENT

This is a national study conducted on behalf of Southern Cross University and your responses will remain anonymous and confidential. The questionnaire takes about 20 minutes depending on your responses ...

SECTION A: RESPONDENT'S GAMBLING

Firstly we need to understand how often you may, or may not, have been involved in various types of gambling activities in the last 12 months ... that is, since this time last year.

- A1 During the last 12 months, how often did you gamble on (*..say type of gambling..*)?
If necessary: Would it have been (..read out scale..)?

(repeat question for each 'type of gambling' listed - randomise sequence)

Type of gambling

- Keno
- Poker machines or gaming machines
- Horse or greyhound racing
- Sports events
- Casino games not on the internet
- Casino games or poker on the internet
- Private gambling for money (e.g. cards, mahjong).

Scale

1. At least once a day
2. Several days a week
3. About once a week
4. About once a fortnight
5. About once a month

6. Once every two or three months
7. Three or four times in the last 12 months
8. Once or twice in the last 12 months
9. Not in the last 12 months
10. Never
11. (*Don't know/Can't say*)

SCREEN 1: COMPUTER TO CALCULATE NUMBER OF TIMES PER YEAR FOR EACH ITEM AND THE TOTAL GAMBLING ACTIVITY PER YEAR OF ITEMS (1) TO (7):

- (1) KENO
- (2) GAMING MACHINES
- (3) HORSES OR GREYHOUND RACING
- (4) SPORTS EVENTS
- (5) CASINO GAMES NOT ON THE INTERNET
- (6) CASINO GAMES OR POKER ON THE INTERNET
- (7) PRIVATE GAMBLING FOR MONEY (EG CARDS, MAHJONG)
- TOTAL OF ITEMS (1) TO (7)

SCREEN 2 IF TOTAL OF ITEMS (1) TO (7) IS '<52 TIMES IN PAST YEAR' - THAT IS RESPONDENT HAS NOT GAMBLED 52 TIMES OR MORE IN THE LAST 12 MONTHS, TERMINATE INTERVIEW AND SKIP TO 'END OF INTERVIEW' SECTION

A2 So we can classify your answers, can you tell me *what is your gender?*

1. Male
2. Female

A3 In what year were you born? (*specify*)

If year of birth refused, ask: Into which of these age-groups do you fall ... (*read out*)

1. 18 to 19 years
2. 20 to 24 years
3. 25 to 29 years
4. 30 to 34 years
5. 35 to 39 years
6. 40 to 44 years
7. 45 to 49 years
8. 50 to 54 years
9. 55 to 59 years
10. 60 to 64 years
11. 65 to 69 years
12. 70 years or more

A4 QUOTA LOCATION

1. SYDNEY
2. OTHER NSW
3. MELBOURNE
4. OTHER VIC
5. BRISBANE

6. OTHER QLD
7. ADELAIDE
8. OTHER SA
9. PERTH
10. OTHER WA
11. HOBART
12. OTHER TAS
13. DARWIN
14. OTHER NT
15. CANBERRA

A5 IF GAMBLING ACTIVITY IS <52 TIMES IN PAST YEAR, CLOSE SUITABLY ... OTHERWISE CONTINUE

PROCEED ONLY WITH PERSONS WHOSE GAMBLING ACTIVITY IS 52 TIMES OR GREATER IN PAST YEAR

A6 This study is conducted in two stages and we would like to offer you ...

- a \$30 Caltex voucher for participating in this stage AND
- a \$20 voucher for participating in the next stage, in 12 months time. The next stage is a simple 10 minute telephone interview.

(If necessary: The vouchers are redeemable for petrol and other goods at Caltex service stations.

Would you like to receive a total of \$50 in Caltex vouchers by completing both stages?

(If only want to do FIRST stage, SAY: "I'm sorry but we're only after people who can participate in **both** stages"

1. Yes - continue
2. Yes, but not now (*Arrange suitable time for call-back*).
3. No (*close suitably*)

BRIEFING NOTE: IN SECTIONS TO FOLLOW WE HAVE PROVIDED "Don't Know/Can't say" AND "Refused" RESPONSE CODES ... THESE CODES ARE NEVER TO BE READ OUT AND USED ONLY IF ABSOLUTELY ESSENTIAL.

Section B: Problem Gambling Disorder

To begin, I'd like to ask you about your past experiences with gambling.

B1 What age were you when you first gambled with money?

(If necessary: This can be on any type of gambling, eg: horse racing, lotteries).

- _____ years (*specify*)
- (*Don't know/can't remember*)
- (*Refused*)

B2 And at what age were you when you first commenced gambling regularly, that is on average once per week on any gambling activity?

- _____ years (*specify*)
- Never gambled regularly
- (*Don't know/can't remember*)
- (*Refused*)

B3 CHECK A1 - GAMBLING TYPES USED IN PAST 12 MONTHS

Thinking about the types of gambling activities you have been involved with in last 12 months ...

Ask for each type used in A1: How much money, not including winnings, did you spend on (*..say type from A1..*) in the last 12 months?

REPEAT FOR EACH TYPE OF GAMBLING MENTIONED IN A1

Types of gambling in A1

- Keno
- Poker machines or gaming machines
- Horse or greyhound racing
- Sports events
- Casino games not on the internet
- Casino games or poker on the internet
- Private gambling for money (e.g. cards, mahjong).

B4 People's experiences with gambling can vary from person to person ...

I am now going to read to you statements some people have made about some of those gambling experiences ...as I read each one I would like you to tell me how often, if at all, each statement has applied to you in the past 12 months. Let's get started.

In the past 12 months (*..read statement..*), would you say (*..read scale..*)?

(Repeat question for each statement - do not randomise presentation order)

Scale

1. Never
2. Sometimes
3. Most of the time
4. Almost always
5. (*Don't know/Can't say*)
6. (*Refused*)

Statements - do not randomise

- how often were you unable to resist the urge to gamble?
- how often did you gamble more money than intended?
- how often did you spend more time gambling than intended?
- how often have you bet more than you could really afford to lose?

- how often have you needed to gamble with larger amounts of money to get the same feeling of excitement?
- how often have you gone back another day to try to win back the money you lost?
- how often have you borrowed money or sold anything to get money to gamble?
- how often have you felt that you might have a problem with gambling?
- how often have people criticised your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?
- how often have you felt guilty about the way you gamble, or what happens when you gamble?
- how often has your gambling caused you any health problems, including stress or anxiety?
- how often has your gambling caused any financial problems for you or your household?

B5 The next statement is more general and applies to you at any time during your lifetime, not just the past 12 months ... At any time during your lifetime have you ever felt you might have a problem with gambling?

(If necessary: Would that be 'No, not at all' or 'Yes, at some time'?)

1. **No/Not at all** (*go to **Section C***)
2. **Yes/At some time** (*continue below*)

B6 What age were you, when you first felt, you might have a problem with your gambling?

- _____ **years old** (*specify*)
- (*Don't Know/Can't say*)
- (*Refused*)

B7 And, at that time, what was the main type of gambling associated with the problem?

Read list if necessary: Would it have been (...read out...)

1. Keno?
2. Casino games (e.g., roulette, card games)?
3. Racing (e.g., horse, greyhound)?
4. Gaming machines (e.g., poker machines)?
5. Sports betting (e.g., football, car racing)?
6. Bingo or Housie?
7. Lotto, Powerball, Tattsлото, Oz Lotto etc?
8. Lotteries
9. Scratch lottery tickets
10. Something else? (specify: _____)
11. (*Don't know/Can't say*)
12. (*Refused*)

Section C: Depressive Disorder

C1 Next some statements concerning people's moods ...

I am going to read you some statements that may be used to describe a person's moods. ... as I read each one I would like you to tell me how much if at all, each statement has applied to you in the past 12 months using the following scale

- 1 not at all
- 2 to some degree or some of the time
- 3 to a considerable degree or a good part of the time
- 4 very much or most of the time

(Suggest respondent makes a note of the scale). Let's get started.

In the past 12 months have (..read statement..), would you say (..read scale..)?
(Repeat question for each statement - randomise presentation order)

Scale

1. not at all
2. to some degree or some of the time
3. to a considerable degree or a good part of the time
4. a very much or most of the time
5. (*Don't know/Can't say*)
6. (*Refused*)

Statements - randomise presentation

- you felt downhearted and blue
- you felt that you had nothing to look forward to
- you felt that life was meaningless
- you felt that you weren't worth much as a person
- you've been unable to become enthusiastic about anything
- you've been unable to experience any positive feelings at all
- you found it difficult to work up the initiative to do things

C2 The next statement is more general and applies to you at any time during your lifetime, not just the past 12 months ... At any time over your lifetime, have you ever felt, you might have a serious problem with depression? (*If necessary: by serious I mean considered seeking treatment for your depression*)

(If necessary: Would that be 'No, not at all' or 'Yes, at some time'?)

1. **No/Not at all** (*go to Section D*)
2. **Yes/At some time** (*continue below*)

C3 At what age were you when you first felt you might have a serious problem with depression?

- _____ **years old** (*specify*)
- (*Don't know/Can't say*)
- (*Refused*)

Section D: Anxiety Disorder

D1 Next some statements that may be used to describe a person's level of anxiety...

I am going to read you some statements that may be used to describe a person's level of anxiety ... as I read each one I would like you to tell me how often, if at all, each statement has applied to you in the past 12 months using the following scale

- 1 not at all
- 2 to some degree or some of the time
- 3 to a considerable degree or a good part of the time
- 4 very much or most of the time

(Suggest respondent makes a note of the scale). Let's get started.

In the past 12 months have (..read statement..), would you say (..read scale..)?

(Repeat question for each statement - randomise presentation order)

Scale

- 1 not at all
- 2 to some degree or some of the time
- 3 to a considerable degree or a good part of the time
- 4 very much or most of the time
- 5 (*Don't know/Can't say*)
- 6 (*Refused*)

Statements - randomise presentation

- you felt you were close to panic
- you felt scared without any good reason
- you've been worried about situations in which you might panic and make a fool of yourself
- you've experienced trembling, for example, in the hands
- you experienced breathing difficulty, for example, excessively rapid breathing, breathlessness in the absence of physical exertion
- you been aware of dryness of your mouth
- you've been aware of the action of your heart in the absence of physical exertion, for example a sense of heart rate increase or heart missing a beat.

D2 The next statement is more general and applies to you at any time, during your lifetime, not just the past 12 months ... At any time over your lifetime have you ever felt you might have a serious problem with anxiety? (*If necessary: by serious I mean considered seeking treatment for your anxiety*)

(If necessary: Would that be 'No, not at all' or 'Yes, at some time'?)

1. **No/Not at all** (*go to Section E*)
2. **Yes/At some time** (*continue below*)

D3 At what age were you when you first felt you might have a serious problem with anxiety?

- _____ **years old** (*specify*)
- (*Don't know/Can't say*)

- *(Refused)*

Section E: Alcohol use Disorder

E1 The next set of questions are about activities you may or may not engage in ... First about your experiences, if any, with alcohol. These questions refer to your consumption of alcohol at home or at some other place during the past 12 months.

To begin, in the past 12 months ... how often did you have a drink containing alcohol?

1. **Never** (go to **Question E11**)
2. Monthly or less
3. 2-4 times a month
4. 2-3 times a week
5. 4 or more times a week
6. *(Don't know/Can't say)*
7. *(Refused)*

E2 In the past 12 months, how many standard drinks did you have on a typical day when you were drinking? (a standard drink is a glass of wine, shot of spirits, middy/pot of full strength beer - larger portions such as stubbies, schooners are 1.5 standard drinks).

1. 1 or 2
2. 3 to 4
3. 5 to 6
4. 7 to 9
5. 10 or more
6. *(Don't know/Can't say)*
7. *(Refused)*

E3 In the past 12 months, how often, if ever, did you have six or more standard drinks on one occasion?

1. Never
2. Less than monthly
3. Monthly
4. Weekly
5. Daily or almost daily
6. *(Don't know/Can't say)*
7. *(Refused)*

E4 In the past 12 months, how often, if ever, did you find you were not able to stop drinking once you had started?

1. Never
2. Less than monthly
3. Monthly
4. Weekly
5. Daily or almost daily
6. *(Don't know/Can't say)*
7. *(Refused)*

E5 In the past 12 months, how often, if ever, did you fail to do what was normally expected of you because of your drinking?

- 1 Never
- 2 Less than monthly
- 3 Monthly
- 4 Weekly
- 5 Daily or almost daily
- 6 (*Don't know/Can't say*)
- 7 (*Refused*)

E6 In the past 12 months, how often, if ever, did you need a first drink in the morning to get yourself going after a heavy drinking session?

- 1 Never
- 2 Less than monthly
- 3 Monthly
- 4 Weekly
- 5 Daily or almost daily
- 6 (*Don't know/Can't say*)
- 7 (*Refused*)

E7 In the past 12 months, how often, if ever, did you have a feeling of guilt or remorse after drinking?

- 1 Never
- 2 Less than monthly
- 3 Monthly
- 4 Weekly
- 5 Daily or Almost daily
- 6 (*Don't know/Can't say*)
- 7 (*Refused*)

E8 In the past 12 months, how often, if ever, were you unable to remember what had happened the night before because you had been drinking?

- 1 Never
- 2 Less than monthly
- 3 Monthly
- 4 Weekly
- 5 Daily or Almost daily
- 6 (*Don't know/Can't say*)
- 7 (*Refused*)

E9 In the past 12 months, were you or someone else injured because of your drinking?

- 1 No
- 2 Yes
- 3 (*Don't Know/Can't say*)
- 4 (*Refused*)

E10 In the past 12 months, was a relative, friend, doctor or other health care worker concerned about your drinking or suggested you cut down?

- 1 No

- 2 Yes
- 3 *(Don't Know/Can't say)*
- 4 *(Refused)*

E11 The next statement is more general and applies to your use of alcohol at any time, during your lifetime, not just the past 12 months ... at any time over your lifetime have you ever felt you might have a serious problem with your alcohol use? (*If necessary: by serious I mean considered seeking treatment for your alcohol use*)

(If necessary: Would that be 'No, not at all' or 'Yes, at some time'?)

1. **No/Not at all** (*go to Section F*)
2. **Yes/At some time** (*continue below*)

E12 At what age were you when you first felt you might have a serious problem with your alcohol use?

- _____ **years old** (*specify*)
- *(Don't Know/Can't say)*
- *(Refused)*

Section F: Nicotine Dependence

F1 Next, about your experiences with smoking or nicotine use in the past 12 months ... have you smoked cigarettes in the past 12 months?

1. **No** (*Skip to Question F8*)
2. **Yes** (*Continue*)

F2 Thinking about the past 12 months ... how soon after you woke up would you smoke your first cigarette? If necessary: Would it be (*..read out..*)?

- 1 Within 5 minutes
- 2 6 to 30 minutes
- 3 31 to 60 minutes
- 4 After 60 minutes
- 5 *(Don't know/Can't say)*
- 6 *(Refused)*

F3 In the past 12 months did you find it difficult to refrain from smoking in places where it is forbidden (eg restaurants, cinemas, airplanes etc)

- 1 Yes
- 2 No
- 3 *(Don't Know/Can't say)*
- 4 *(Refused)*

F4 In the past 12 months, which cigarette would you hate to give up most?

- 1 The first one in the morning?
- 2 Any other

F5 In the past 12 months, how many cigarettes per day did you smoke per day?

- 1 10 or less
- 2 11 to 20
- 3 21 to 30
- 4 31 or more
- 5 (*Don't know/Can't say*)
- 6 (*Refused*)

F6 In the past 12 months, did you smoke more frequently during the first hours after waking than during the rest of the day?

- 1 Yes
- 2 No
- 3 (*Don't Know/Can't say*)
- 4 (*Refused*)

F7 In the past 12 months, did you (or would you) continue to smoke even if you were so ill that you were in bed most of the day?

- 1 Yes
- 2 No
- 3 (*Don't Know/Can't say*)
- 4 (*Refused*)

F8 The next statement is more general and applies to your dependence on nicotine at any time, during your lifetime, not just the past 12 months ... at any time over your lifetime have you ever felt you might have a dependence on nicotine? (*If necessary*: by dependence I mean you were smoking more and more and would have withdrawal symptoms without a cigarette).

(*If necessary*: Would that be 'No, not at all' or 'Yes, at some time'?)

1. **No/Not at all** (*go to Section G*)
2. **Yes/At some time** (*continue below*)

F9 At what age were you when you first felt you might have a dependence on nicotine?

- _____ **years old** (*specify*)
- (*Don't Know/Can't say*)
- (*Refused*)

Section G: Substance use Disorder

G1 I'd now like to ask you about your involvement, if any, with substances other than alcohol and tobacco during the past 12 months ... To do this I am going to use the term 'drugs'. By this I mean prescription drugs or recreational drugs.

In the past 12 months (*..read statement..*)?

Scale

1. Yes
2. No
3. Refused (don't read out).

Statements

- have you used prescription drugs in excess of the directions have you used recreational drugs, other than alcohol or nicotine?

(If necessary: I'd like to remind you your answers are confidential and will be combined with information from the other participants in the study.)

CHECK: If 'No' to BOTH statements skip to Section H:

G2 Next I am going to read out some statements concerning the use of prescription drugs or recreational drugs... as I read each statement please answer with a 'Yes' or 'No' whether the statement would have applied to you in the past 12 months.

In the past 12 months (..read statement..)? (Repeat this question for each statement)

Scale

1. Yes
2. No
3. (Don't know/Can't say)
4. (Refused)

Statements - randomise presentation

- have you always been able to stop using drugs when you wanted to?
- have you had "blackouts" or "flashbacks" as a result of drug use?
- have you ever felt bad or guilty about your drug use?
- has your spouse (or parent) ever complained about your involvement with drugs?
- have you neglected your family because of your use of drugs?
- have you engaged in illegal activities in order to obtain drugs?
- have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?
- have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding etc...)?
- have you abused more than one drug at a time?

G3 The next statement is more general and applies to your drug use at any time, during your lifetime, not just in the past 12 months ...at any time in your lifetime have you ever felt you might have a drug use problem?

1. No/Not at all (skip to Section H) or
2. Yes/At some time (continue below)

G4 At what age were you when you first felt you might have a drug use problem?

- _____ **years old** (specify)

- *(Don't Know/Can't say)*
- *(Refused)*

Section H: Personality Profile

RANDOMISE STARTING QUESTION BETWEEN H1, H2, H3, H4 AND H5

In this final section of this study, I am going to read different sets of statements that have been used to describe how people think and feel ...

H1 This set of statements refers to the different way or ways people may think ... as I read each statement please tell me how strongly you personally agree or disagree with each as a description of you.

How strongly do you agree or disagree that (*..read statement..*), would that be (*..read scale..*)?
(Repeat question for each statement)

Scale

- | | |
|---|-------------------------------|
| 1 | Agree Strongly |
| 2 | Agree Somewhat |
| 3 | Disagree Somewhat |
| 4 | Disagree Strongly |
| 5 | <i>(Don't know/Can't say)</i> |
| 6 | <i>(Refused)</i> |

Statements - randomise presentation order

- you have a reserved and cautious attitude toward life.
- your thinking is usually careful and purposeful.
- you are not one of those people who blurt out things without thinking.
- you like to stop and think things over before you do them.
- you don't like to start a project until you know exactly how to proceed.
- you tend to value and follow a rational, "sensible" approach to things.
- you usually make up your mind through careful reasoning.
- you are a cautious person.
- before you get into a new situation you like to find out what to expect from it.
- you usually think carefully before doing anything.
- before making up your mind, you consider all the advantages and disadvantages.

H2 This list of statements refers to people's feelings and actions ... as I read each statement please tell me how strongly you personally agree or disagree with each as a description of you.

How strongly do you agree or disagree that (*..read statement..*), would that be (*..read scale..*)?
(Repeat question for each statement)

Scale

- | | |
|---|-------------------------------|
| 1 | Agree Strongly |
| 2 | Agree Somewhat |
| 3 | Disagree Somewhat |
| 4 | Disagree Strongly |
| 5 | <i>(Don't know/Can't say)</i> |
| 6 | <i>(Refused)</i> |

Statements - randomise presentation order

- you have trouble controlling your impulses.
- you have trouble resisting your cravings (for food, cigarettes, etc.).
- you often get involved in things you later wish you could get out of.
- when you feel bad, you will often do things you later regret in order to make yourself feel better now.
- sometimes when you feel bad, you can't seem to stop what you are doing even though it is making you feel worse.
- when you're upset you often act without thinking.
- when you feel rejected, you will often say things that you later regret.
- it is hard for you to resist acting on your feelings.
- you often make matters worse because you act without thinking when you are upset.
- in the heat of an argument, you will often say things that you later regret.
- you always keep your feelings under control.
- sometimes you do impulsive things that you later regret

H3 This list of statements is about people's attitudes to activities ... as I read each statement please tell me how strongly you personally agree or disagree with each as a description of you.

How strongly do you agree or disagree that (*..read statement..*), would that be (*..read scale..*)?
(*Repeat question for each statement*)

Scale

- | | |
|---|---------------------------------|
| 1 | Agree Strongly |
| 2 | Agree Somewhat |
| 3 | Disagree Somewhat |
| 4 | Disagree Strongly |
| 5 | (<i>Don't know/Can't say</i>) |
| 6 | (<i>Refused</i>) |

Statements - randomise presentation order

- you generally seek new and exciting experiences and sensations.
- you'll try anything once.
- you like sports and games in which you have to choose your next move very quickly.
- you would enjoy water skiing.
- you quite enjoy taking risks.
- you would enjoy parachute jumping.
- you welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional.
- you would like to learn to fly an airplane.
- you would like to go scuba diving.
- you would enjoy fast driving.
- you would enjoy the sensation of skiing very fast down a high mountain slope.
- you sometimes like doing things that are a bit frightening.

H4 This set of statements refers to people's actions when they are feeling good ... as I read each statement please tell me how strongly you personally agree or disagree with each as a description of you.

How strongly do you agree or disagree that (*..read statement..*), would that be (*..read scale..*)?
(*Repeat question for each statement*)

Scale

- 1 Agree Strongly
- 2 Agree Somewhat
- 3 Disagree Somewhat
- 4 Disagree Strongly
- 5 (*Don't know/Can't say*)
- 6 (*Refused*)

Statements - randomise presentation order

- when you are very happy, you can't seem to stop yourself from doing things that can have bad consequences.
- when you're in a great mood you tend to get into situations that could cause you problems.
- when you are very happy, you tend to do things that may cause problems in your life.
- you tend to lose control when you are in a great mood
- when you're really ecstatic, you tend to get out of control.
- others would say you make bad choices when you're extremely happy about something.
- others are shocked or worried about the things you do when you are feeling very excited.
- when you get really happy about something, you tend to do things that can have bad consequences.
- when overjoyed, you feel like you can't stop yourself from going overboard.
- when you are really excited, you tend not to think of the consequences of your actions.
- you tend to act without thinking when you are really excited.
- when you are really happy, you often find yourself in situations that you normally wouldn't be comfortable with.
- when you are very happy, you feel like it is OK to give in to cravings or overindulge.
- you are surprised at the things you do while in a great mood.

H5 This set of statements refers to the different ways that people approach tasks ... as I read each statement please tell me how strongly you personally agree or disagree with each as a description of you.

How strongly do you agree or disagree that (*..read statement..*), would that be (*..read scale..*)?
(*Repeat question for each statement*)

Scale

- 1 Agree Strongly
- 2 Agree Somewhat
- 3 Disagree Somewhat
- 4 Disagree Strongly

5 (Don't know/Can't say)
6 (Refused)

- You generally like to see things through to the end.
- You tend to give up easily.
- Unfinished tasks really bother you.
- Once you get going on something you hate to stop.
- You concentrate easily.
- You finish what you start.
- You are able to pace yourself so as to get things done on time.
- You are a person who always gets the job done.
- You almost always finish projects that you start.
- Sometimes there are so many little things to be done that you just ignore them all.

Section I: CLOSING

Thank-you, that's the end of the survey. So I can send you the vouchers I will need to get a name and mailing address. This information will not be used for any other purpose other than to send you the \$30 voucher.

Name: _____

Mailing Address: _____

Town/Suburb: _____

Postcode: _____

Would you like to have the contact details of the person sending you the vouchers?
If yes (John Haw, ph. (02) 6626 9429).

We will record your name and telephone number and call you in approximately 12 months time to do another brief telephone interview. After that interview, you will be sent a \$20 Caltex voucher.

Southern Cross University conducts 1 or 2 gambling studies per year. Would you like to be informed about these studies?

- 1 Yes
- 2 No/DK

As this is University research it has been approved by the Southern Cross University Human Research Ethics Committee. Would you like to know more about this project or about counselling services that help people with the issues we've discussed?

_ READ OUT IF WANTED: _ The ethics approval number for this project is 09110 and the ethics officer is Sue Kelly. Her phone number is 02 6626 9139. There is a national telephone helpline that provides free and confidential counselling advice. Their number is 13 11 14.

_ READ TO ALL: _ As part of quality control procedures, someone from Reark Research may wish to re-contact you to ask a couple of questions verifying some of the information we just collected. Can I confirm your phone number:
_ [Q0PH] _

Thanks again for your time, just to remind you, I am from Reark Research. If you have any queries about the research or your vouchers you can call the project coordinator John Haw on 02 6626 9429."