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*Flinders Human Behaviour & Health Research Unit*

# THE DEFINITION AND PREDICTORS OF RELAPSE IN PROBLEM GAMBLING

# FINAL REPORT

**Commissioned by:**

**Gambling Research Australia (GRA)**

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## HOW TO READ THIS REPORT

This report comprises the Executive Summary and Final Report (Section 1) and 4 component research reports (Section 2). The report thus brings together in one cohesive document the 4 component studies: Literature Review, Delphi Study, Focus Group Study and Observational Study.

In reading this report it is recommended that the Final Report is read first so that the framework of the study as a whole can be best appreciated as the conclusions are based on the findings of all four studies. Together, the studies can be seen as building on previous research and taking the understanding of relapse in problem gambling a number of significant steps forward.

1. The Executive Summary provides a synopsis of all the components of the relapse research project and provides recommendations for clinical practice and further research.
2. The Final Report provides an overview of the relapse project and includes a summary of the methodology and the major findings of each of the four separate studies, drawing them together to address the objectives of the project and a revised model of relapse in problem gambling. It includes recommendations for future research.
3. The four component studies have been written up independently. They are presented as individual research reports as each was a substantial, stand alone piece of work

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# SECTION 1: PROJECT REPORT

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## EXECUTIVE SUMMARY

### Background

Problem gambling is associated with significant personal and societal harms. Australia's Gambling Industries Productivity Commission Report (1999) estimated that up to 2% of Australian adults are considered "problem gamblers", who experience serious impacts including suicide, occupational loss and family breakdown. For each problem gambler, it is estimated that a further seven individuals are directly affected (AusInfo, 1999).

With an increasing prevalence of problem gambling in Australia associated with the introduction of electronic gaming machines, research into problem gambling has focussed mainly on its prevalence and finding effective treatments. Research into relapse in problem gambling has received little attention in Australia and internationally. This study was funded by Gambling Research Australia to develop a definition of relapse, examine the predictors of relapse and propose a model of relapse in problem gambling.

It suggested that the Final Report is read first as it integrates the most important details of each of the four subsidiary studies, which are presented for further detailed examination.

### Methodology

The project used an iterative ground-up process with four separate studies that informed each successive study. The project used both qualitative and quantitative data. The final Observational Study was based on the definitions, elements of relapse and potential predictors found in the previous studies. The four studies were:
- A Literature Review.
- A Delphi consultation, which aimed to provide a consensus on a definition of relapse in problem gambling, potential predictors and recommended measures for relapse studies in problem gambling.
- A Focus Group Study with therapists from different therapy or counselling services, and clients and partners who were users of the services or from support groups.
- An Observational Study, which used the findings of the three previous studies to measure relapse, and, where possible, to use validated measures of potential predictors of relapse to see which were the strongest.

### Results

This project is the first of its kind to sequentially and, using qualitative and quantitative methodologies, comprehensively address relapse in problem gambling.

The Literature Review found few studies of relapse in problem gambling, and investigated similar studies in the alcohol and substance abuse literature.

Potential predictors of relapse in problem gambling that were identified included, dis-inhibition and impaired decision making, an urge, i.e., a psychophysiological response to an external or internal trigger linked with gambling, cognitions about gambling and negative affect. Other potential predictors included self-efficacy, impulsivity, availability of gambling, co-morbid psychiatric disorders and substance use. The review recommended that relapse be considered in more than one domain and that relapse be measured in the context of the individual's goals.

The Delphi Study, with responses from 22 national and international experts in problem gambling over two rounds, produced a consensus that relapse as a process consisted of three domains: behavioural, cognitive and interpersonal. Within these domains, were a number of elements of relapse so that relapse could not be summarised in one "definition". A global definition was agreed:

*Relapse is the re-emergence of gambling that may cause harm to the individual, significant others or the community after a period of abstinence or controlled gambling.*

The final stage of the Delphi process included a review of the above findings by an expert panel. There was consensus that the definitions of lapse and relapse that were proposed, whilst acceptable conceptually, were not measurable.

It was proposed that lapse be defined as: "a single episode after a period of abstinence or more than the planned controlled gambling," and that relapse was: "more than one episode of gambling after a period of abstinence or controlled gambling."

The Focus Group Study conducted four groups with two groups of therapists (one from the Statewide Gambling Therapy Service and one from therapists and counsellors from other agencies), one group of clients of these agencies and one of partners of these problem gamblers. The study found six key predictors of relapse: cognitions, urge, therapy, quality of relationships, negative affective states and environmental factors. Whilst individual factors were identified, it was found that relapse was a dynamic process in which these factors interacted. The final hypothesis coming out of this empirical study was that: "There is a chain of mental and behavioural events that occurs in gambling relapse behaviour, which is modified by a "push" towards and a "pull" away from relapse". To manage the "push" coping strategies were either taught in therapy, learned from peers or were developed by the individual themselves. For some, mastery over the urge to gamble was the most powerful factor in reducing the "push", as by eliminating the urge altogether, gamblers were not at the mercy of push or pull factors. This mastery was most often described by those who had used an exposure-based therapy program that aims to extinguish the urge to gamble. The interaction of the many predictors of relapse within this dynamic relapse process led to the proposal of a model for relapse for gambling.

The Observational Study used the Victorian Gambling Screen (VGS) as a measure of relapse because its items corresponded to many of the identified elements of relapse. These included a measure of gambling behaviour, frequency of gambling and other measures, based on the recommendation of the expert panel. Potential predictors of relapse in the form of eight validated questionnaires were included in the design to assess impulsivity, social support, co-morbidity with anxiety, depression and alcohol problems, negative affects, social adjustment and urge. In all, 158 people were recruited to the study, half of whom were male (54%), followed for a median of 8.3 months, with 78.5% completing at least one follow up measure. Baseline data showed that as a group, they exhibited moderate to severe levels of problem gambling, depression (53% severe or extremely severe) and anxiety (56% severe or extremely severe), and 29% had a harmful or dependent pattern of alcohol use. During the study period, 46.8% experienced a remission from which to study relapse.

In determining predictors after all potential factors were entered into the analysis, using both measures of relapse, the VGS and gambling frequency, gambling urge (GUS), was a highly significant predictor of gambling relapse. Whilst significant using the VGS, GRCS (cognitive distortions) was not significant using gambling behaviour as the outcome measure, though it did contribute to the model. However, both urge and cognitions are significant predictors in those continuing to gamble, i.e., who have not recovered. A possible explanation for these observations is that when someone continues to gamble, urge and cognitions are part of the same phenomenon, and drive the gambling behaviour. When they recover, erroneous

cognitions resolve, but unless urge is fully extinguished they are vulnerable to relapse, at which stage cognitions again become erroneous. The longer the person continues to engage in problem gambling, the more powerful the urge and erroneous cognitions become.

Summarising the results of the four studies, a global definition, domains, elements and predictors of relapse have been proposed. The VGS and gambling frequency, derived from these findings, have been identified as quantitative measures of relapse. Findings from the Focus Group Study were supported by the Observational Study, which found strong evidence that gambling urge was a significant predictor, and that gambling related cognitions, whilst less significant, contributed overall to the explanatory models of relapse. The Focus Group Study highlighted the individual, dynamic nature of relapse, which can be seen as a chain of mental events modified by factors which "push" or "pull" a person towards relapse. This multifactorial process is described in the first proposed model for relapse in problem gambling. Comparisons with other models of addiction and problem gambling are discussed in the Final Report.

## Recommendations

This research is the first of its kind to use a sequential approach to defining and identifying predictors of relapse in problem gambling. We recommend the following.

### Clinical practice

1. From the Focus Group Study and baseline measures of psychiatric morbidity in the Observational Study, it appears that problem gamblers experience substantial co-morbidity; as such a mental health assessment should form part of the intake assessment for clients of all gambling services and include the recognition and management of all co-morbidity, especially depression.
2. In this study treatment of the urge to gamble appeared to be the most effective approach to terminating problem gambling and the avoidance of relapse. This remains to be definitively established.
3. With cognitive behaviour therapy offering the most promise for the elimination of urge and altered cognitions, consideration needs to be given to training in exposure and cognitive restructuring aspects of cognitive behaviour therapy for gambling counselling or therapy services.
4. Urge and cognitions should be measured at the commencement of treatment and at discharge as potential predictors of relapse. Clients should be educated about the need to eliminate urge and modify cognitions to prevent relapse.

### Research

5. Treatment issues emerged as an important focus in this study. Those treated specifically with an urge reduction and response prevention strategy within a comprehensive cognitive behavioural approach clearly seemed to fare better when confronted with relapse situations.
6. This study strongly suggests that urge exposure and response prevention is effective in problem gambling treatment. A randomised controlled trial of this modality compared to a range of other treatments is warranted.
7. The findings of this study need to be tested with a number of other focus group populations, including:
   a) Clients receiving a variety of CBT strategies, including cognitive therapy alone, which focuses upon different aspects of the relapse process
   b) Non treatment-seeking problem gamblers

      c) Aboriginal and CALD clients exploring the presence of cultural factors in the context of relapse

      d) Problem gamblers with co-morbid mental health disorders and personality traits such as impulsivity, sensation-seeking, disinhibition and susceptibility to reward.

8. The findings of this study need to be extended with a larger group to specifically examine the quantitative components of the proposed model, as a number of potential predictors of relapse failed to gain statistical significance.

Predictors for gambling relapse have been significantly altered by the findings from this project. As such it is recommended that:

9. These data be put to the international Delphi Study group and that they be asked to further consider the hierarchy of predictors in gambling

10. There is a need to explore the relationship of the model proposed in this project against other aetiological and relapse models in problem gambling and other addictive behaviours, such as that developed by Witkiewitz and Marlatt (2004 and 2007).

11. An international consensus workshop on an agreed model of relapse in problem gambling be convened in association with the next "Think Tank" meeting of international experts in New Zealand in 2009.

The sequence of mental and behavioural events described in this study present many important questions that need to be answered if relapse in problem gambling is to be fully understood. A number of important studies need to explore aspects of this process in order to test its generalisability and to better describe its characteristics. The following are recommended:

12. Establishing the nature and frequency of the mental and behavioural sequences using a methodology such as an in-depth interview

13. The characteristics of the apparent altered cognition prior to and during relapse need to be described and evaluated

14. The capacity for problem gamblers to learn when they appear to move into and out of an altered cognitive set or altered state of consciousness has important implications for treatment. This then needs to be examined, as therapy of any sort may be ineffective; if this is so ways of interrupting this altered state of consciousness during relapse ("the zone") need to be explored.

## Machine Design

Developing public health interventions to minimise the harm that occurs when problem gamblers are in an altered state of consciousness ("the zone") needs to be explored. This altered state of consciousness appears to have features consistent with the problem gambler being in a dissociative state, i.e. being seriously psychologically impaired at the time. The potential exists for EGMs to be programmed to recognise patterns of the use of these machines that are indicative of problem gambling and in those situations "pop up" messaging could assist problem gamblers to escape from this altered state of cognitive function as a harm reduction intervention. As such it is recommended that:

15. The existence and the nature of "the zone" be examined to establish if such a state of mind with diminished responsibility and cognitive malfunction is in fact involved in gambling relapse and in prolonging a relapse.

16. Ways of interrupting this altered state of consciousness during relapse ("the zone") need to be explored as a harm minimisation strategy that may be able to be automated by alteration in EGM programming.

# FINAL REPORT

## 1. INTRODUCTION

### Background

Problem gambling and gambling-related behaviours are associated with significant negative social and economic consequences. Recent prevalence studies in the United States and Canada estimated 1-2% of the adult population met the diagnostic criteria for pathological gambling (Shaffer and Hall, 2001). Similar prevalence rates in Australia vary from less than 1% to approximately 2.5% across the states and territories (AusInfo, 1999, Delfabbro, 2007). Treatment protocols and treatment evaluation studies for problem gambling have increased in recent years (Ladoucer et al., 2001, Viets and Miller, 1997), however there is a paucity of empirical research examining the association between individual characteristics and treatment outcomes, including relapse processes (Daughters et al., 2003).

Ledgerwood and Petry (2006) identified potential psychological, psychobiological, social, and environmental factors influencing relapse in problem gambling (Ledgerwood and Petry, 2006). Examples of predictive factors in previous studies investigating gambling relapse include neurocognitive measures of disinhibition and decision making (Goudriaan et al., 2007); affective states and stress reactivity (Daughters et al., 2003) and satisfaction with treatment, alcohol consumption and neuroticism (Echeburua et al., 2001). However, there are important methodological and measurement issues in relapse research in problem gambling as with other addictive behaviours (Witkiewitz and Marlatt, 2004) in particular the problem of retrospectivity with recall bias. Hence prospective investigations are recommended (McKay et al., 2006) .

### Objectives

With only three prospective studies of predictors of relapse in problem gambling in the literature, variable methodological rigor and consistency of approaches, no consensus on what constitutes relapse nor even of an adequate, agreed definition of relapse in problem gambling, Gambling Research Australia (GRA) commissioned this research, which had the following objectives:

- The conduct of a systematic review of the literature examining factors that predict relapse in problem gamblers and other addictive behaviours, including alcohol and drugs of dependence
- The development of a national and international consensus of predictors and a definition of relapse in problem gambling using a Delphi methodology
- A Focus Group Study of the relapse process in problem gamblers
- A prospective Observational Study of predictors for relapse in treatment-seeking problem gamblers taking into account the findings of the Literature Review, the Delphi definition of relapse and potential predictors and the Focus Group Study
- Revision of the model of relapse in problem gambling based on the findings of these studies.

### Methodology

In order to address these objectives this study used both qualitative and quantitative methodologies in a phased approach over the 18 months of the study. Whilst each of the four components of the research stood alone, the process was both sequential and overlapping, with the earlier parts of the research (Literature Review and Delphi Study) informing the latter parts of the study (Focus Group and Observational Study). The sequencing of the

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research is shown in Figure 1. As can be seen the Literature Review commenced from the start of the project and was completed by April 2008 (9 months). Preparation for the Delphi Study required the recruitment of national and international experts, which took a considerable period (3 months); once started the study proceeded quickly, being completed in February 2008 (4 months). The preliminary draft of the Literature Review (November 2007) provided the raw material for the Delphi process. The initial prioritisation of the predictors and elements of relapse in problem gambling arrived at in the first meeting of the Delphi international expert group in November 2008 was central to providing input for the 3 Focus Groups and the planning for the Observational Study that followed this meeting. Thus the process of this research program was such that the overlap, constant monitoring and the discussion between the members of the research team resulted in each of the studies taking into account preceding findings.

## 2. LITERATURE REVIEW

The objective of the Literature Review was "the conduct of a systematic review of the literature examining factors that predict relapse in problem gamblers and other addictive behaviours, including alcohol and drugs of dependence" as specified in the project brief. Within the context of the overall project, the review has ended up being less than systematic as defined in the Cochrane guidelines for systematic reviews and meta-analyses (Higgins and Green, 2008). The purpose of the review was primarily to guide the study in each of its phases, so that an up-to-date, informed enquiry was pursued in gaining a practical consensus about the hierarchy of predictors and elements of relapse by experts in the field at a very early stage of the project.

Of necessity this "cast the net wide" in order to consider all factors associated or thought to be associated with relapse in problem gambling and other addictive behaviours. The methodology of formal systematic reviews is far more restrictive than the purpose of a pragmatic approach designed to reach a consensus. A similar conflict of purpose for the review also resulted from the need to conduct the Focus Group Study, where the qualitative literature had to be examined. Again systematic reviews exclude such studies, as such reviews are designed to harness a robust set of cumulative data the can be statistically aggregated in a way that has validity and reliability at the empirical level (Higgins and Green, 2008). The literature in problem gambling has a very long way to go before such aggregation can be achieved.

# Figure 1

## Predictors of Relapse in Problem Gambling

### Project Timeline: August 2007 - August 2009
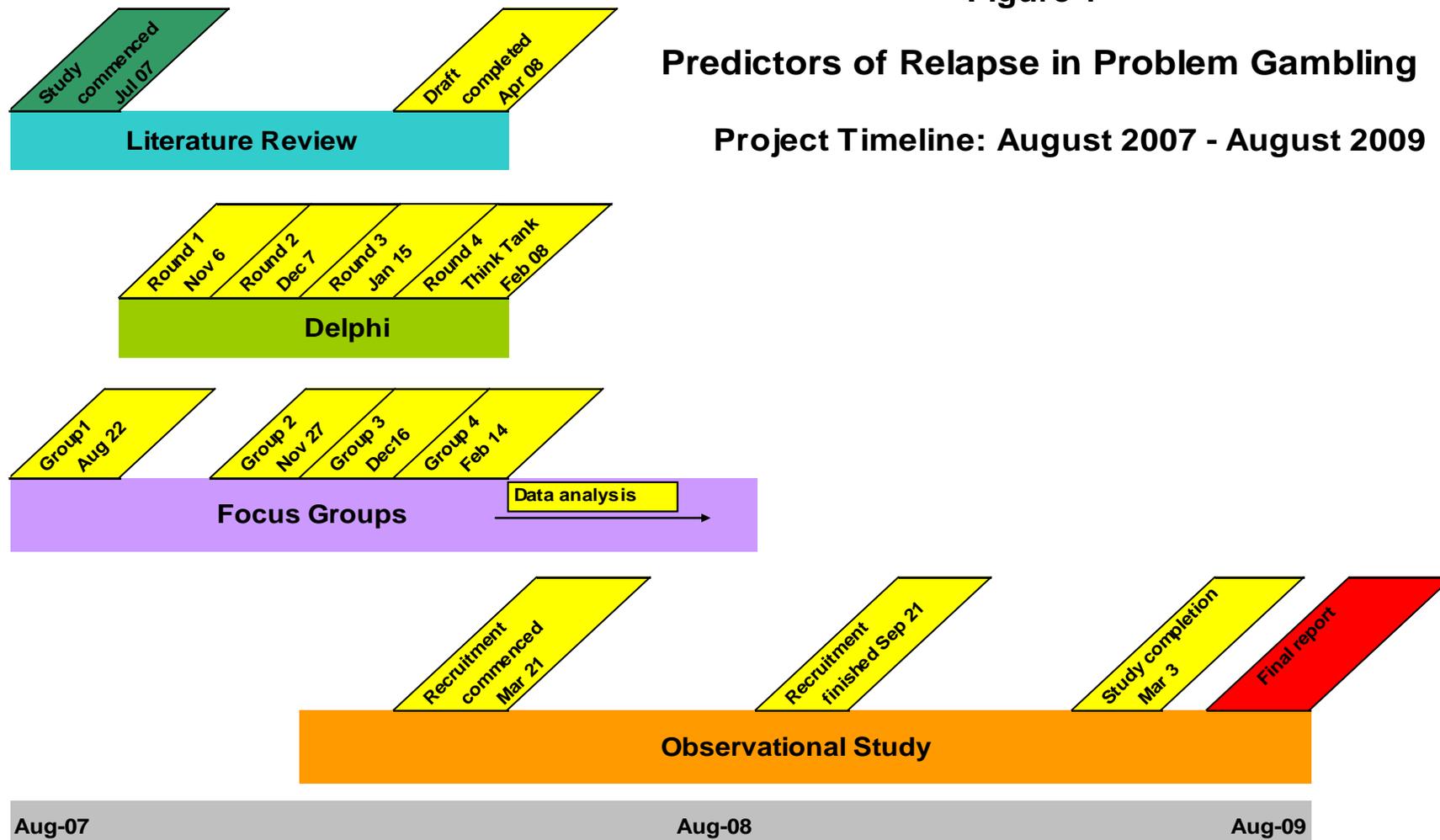
**Study commenced Jul 07** — **Draft completed Apr 08**

**Literature Review**

**Round 1 Nov 6** | **Round 2 Dec 7** | **Round 3 Jan 15** | **Round 4 Think Tank Feb 08**

**Delphi**

**Group1 Aug 22** — **Group 2 Nov 27** | **Group 3 Dec16** | **Group 4 Feb 14**

**Data analysis**

**Focus Groups**

**Recruitment commenced Mar 21** — **Recruitment finished Sep 21** — **Study completion Mar 3** — **Final report**

**Observational Study**

**Aug-07**     **Aug-08**     **Aug-09**

This Literature Review has therefore served the purpose of informing the project overall and incorporates our interpretation and evaluation of the data available on relapse factors in problem gambling, alcohol and other drug problems and addictive behaviours. For the first time the Literature Review attempts to incorporate both quantitative and qualitative findings in this area.

## Results

A brief summary of the Literature Review follows, with a full detailed Literature Review provided in Section 2, and targeted reviews provided for each of the technical research reports.

The task of the Literature Review was to critically examine all the purported predictors of relapse and examine those for which there was the best level of evidence available. This was done by selection firstly of those studies that had good methodologies, i.e. were experimental or prospective studies of problem gambling relapse. Secondly, studies of predictors of problem gambling per se were included on the basis that they might also serve as predictors of relapse once a problem gambler had achieved some control of their gambling. Thirdly, the literature studying predictors of relapse of other addictive behaviours was included. In addition, the Delphi and Focus Group Studies required a review of the qualitative literature. Relatively few studies have directly examined predictors of gambling relapse. The qualitative studies complemented the initial Literature Review, together providing more complete information about relapse in problem gambling.

The findings of the review were that studies employing the strongest methodologies, either true experiments or prospective designs provided support for the role of disinhibition, impaired decision-making, and gambling urges as predictors of increased likelihood of gambling relapse, and tolerance of negative affect as predictive of delay to gambling relapse. Similar factors were also described in the qualitative studies across the addictive behaviours. In addition qualitative studies in problem gambling relapse suggest that there is a process that develops to engender the problem gambling state that maintains it in a cycle of repeated lapses and relapses and can be managed or ceased by the use of treatments and positive changes in people's lives.

The relationship between self-efficacy and relapse is supported in other addictions. There is reasonably strong evidence that impulsivity and related personality traits, certain co-morbid psychiatric disorders (Antisocial Personality Disorders and Substance Use Disorders have the strongest support) are predictors of relapse in addictions. In addition the presence of mental health co-morbidity such as post-traumatic stress disorder (PTSD), past childhood trauma and sorrow was supported in the qualitative data. The presence of negative affect including stress, conflict, emotional highs and lows, boredom and the need for escape from these, posed considerable risks in the relapse to addictive behaviours in the majority of the qualitative studies reviewed.

Gambling expectancies (especially expectancies of winning) and gambling availability contributed to frequency and intensity of gambling behaviour. Although these have not been directly studied as factors in gambling relapse, they are likely to be promising candidates for future research into gambling relapse predictors. Environmental triggers that enticed people to engage in addictive behaviours were also highlighted as important in the qualitative studies. There is weak and inconsistent support for sensation-seeking and reward dependence as related to gambling behaviours and other predictors. Qualitative studies have not recognised these as important issues.

The qualitative studies all provided data on common protective factors that reduce the risk of relapse. These included the use of coping strategies, self-efficacy and self-esteem; existential issues such as involvement, quality of life, spirituality and the belief in a higher power; the availability of affective and social support; and the acquisition of relapse prevention skills and knowledge about the drug or addictive behaviour. As these findings were not matched in the quantitative literature a low category of relationship could only be allocated to these factors.

On the basis of these conclusions in the Literature Review, a number of suggestions were made about the need to modify the dynamic relapse model developed for alcohol use disorders by Witkiewitz and Marlatt ( 2004). This will be fully addressed later in this report, as there are a number of other findings that also pertain to models for relapse in problem gambling.

## 3. DELPHI STUDY

### Introduction

The measurement of gambling-related problems is an ongoing challenge, with no consistent definitions of abstinence and controlled gambling. There are also no clear definitions of gambling lapse and gambling relapse. Problem gambling is proposed to have a similar aetiology to other addiction models, including alcohol. However, as indicated above, there are distinct differences between problem gambling and other addictive behaviours, as there are no effects of any external psycho-active addictive substances contributing to the addictive behaviour per se.

A crucial step in the development of a framework for investigating relapse in problem gambling was therefore the development of an agreed definition of lapse and relapse, and the allocation of a hierarchy of predictors for relapse as well as the use of measuring instruments that would be valid and reliable in quantifying such relapse. These were the aims of the Delphi Study which were defined as follows in the original project brief: "The development of a national and international consensus of predictors and a definition of relapse in problem gambling."

### Methodology

Gaining consensus between experts can be achieved by either structured or unstructured processes. Unstructured processes may lack truth value (Guba, 1981) as they cannot be replicated in a consistent way. As such a Delphi consultation process was chosen for this study.

The Delphi technique uses an iterative process whereby individuals are provided the opportunity to express their opinions about structured propositions and then to receive feedback about the aggregated opinions expressed by non-identified others. They are then accorded the opportunity to reconsider the opinions that they expressed previously, in light of the collective feedback received, in the next round of the consultation. As the process continues, participants may then change their opinions based on feedback of summary measures from preceding rounds to reach a consensus (Mullen, 2003). Advantages of the Delphi method include its ability to structure and organise group communication (Powell, 2003), and the diversity of applications and modifications for business, industry and health care research (Addington et al., 2005). Individuals can be engaged face to face or by mail or online (Hasson et al., 2000). In this case a panel of experts was chosen to try to achieve a consensus about both the definition(s) of lapse and relapse as well as the allocation of a hierarchy of predictors of relapse. A panel of experts for a Delphi Study is not required to be statistically representative of the population of experts as a whole. Rather the panel is

assessed on qualities such as degree of expertise of individuals rather than the overall number (Powell, 2003). A panel comprising 25 experts with relatively homogenous characteristics is considered methodologically sound (Delbecq et al., 1975). Delbecq states that homogenous groups beyond 30 have limited new ideas generated; 10 to 15 should be enough, with panels of approximately 20 members tending to demonstrate stability from one round to the next (Mullen, 2003).

**Panel selection**

It was considered that the Delphi process would take four iterations. The number of rounds were not determined *a priori,* as each iteration informed the next and by end of round three, strong consensus was indicated for 16 (88.9%) of the elements of relapse and 62 items (93.9%) for predictors of relapse. The first round comprised local, national and international experts in the areas of problem gambling and other addictive behaviours (n=8); the second round comprised a pool of 48 international experts who were approached, 22 of whom completed two iterations that achieved a high level of consensus (rounds 2 and 3); and the final round which was conducted face to face with (n=6) international experts at the "Think Tank" in Auckland, New Zealand in February 2009 where the findings of the Delphi Study were subject to peer review (round 4). The details of the participants are given in the full Delphi Study report.

**Results**

The first round of the study was conducted with a panel of national and international experts convened in Adelaide. It agreed on a global definition of relapse, but observed that relapse consisted of a process that could be described in a number of domains and within each domain were a number of elements (see below).

The global definition of relapse in problem gambling was provided for consideration by the following rounds of the Delphi panel experts:

*Relapse is the re-emergence of gambling that may cause harm to the individual, significant others or the community after a period of abstinence or controlled gambling.*

The concept of lapse as a brief episode of recurrence of the gambling behaviour as used in the addictions was discussed. As a starting point for the Delphi process, alternative definitions of lapse were developed to account for both abstinent and controlled gambling.

Definitions for lapse where abstinence had been the goal:

*Lapse is a single gambling episode after a period of abstinence that does not cause harm to the individual significant others or the community.*

*Lapse is a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode.*

*Lapse is a single gambling episode after a period of abstinence that does not involve prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.*

Definitions for lapse where controlled gambling had been the goal:

*Lapse is a re-occurrence of a gambling episode (or pattern of gambling) that does not cause harm to the individual, significant others or the community after a period of controlled gambling and is not the start of a relapse.*

*Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not cause harm the individual, significant others or the community.*

*Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve an ongoing or prolonged loss of control beyond the episode.*

*Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve a prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the commu*nity.

Expanding on the global definition, expert panel members of round one constructed a list of elements within domains of relapse. Participants in round one also constructed a list of potential predictors of problem gambling which was guided by the literature according to the framework of the social learning model as defined by Marlatt and Gordon (1985).

These lists were agreed to as representing a comprehensive start for the second round consultation. The participants of round one were also asked to construct a list of national and international experts who should be approached to participate in subsequent Delphi rounds.

The global definition of relapse was provided to Delphi participants to guide their consideration of the definitions of lapse and elements of relapse and potential predictors of relapse. The tables of elements, predictors and definitions of lapse were forwarded to the list of experts and 22 of the 48 approached participated in the second and third rounds. Each element and predictor was rated by the participants as 1 = essential, 2 = very important, 3 = important, 4 = less important, or 5 = unimportant. The degree of consensus was assessed by calculating the semi-inter-quartile range (Jenkins and Smith, 1994, Jones and Hunter, 1995). The inter-quartile range of scores for each element or predictor comprises of 50% of the scores between the 25th percentile and 75th percentile. For example for a median score of 1, strong group consensus would be indicated when 50% of scores lie between 0.5 and 1.5, giving a semi inter-quartile range of 0.5. Therefore absolute values of 0.5 or less were interpreted as indicating strong group consensus for each element and predictor of relapse . Tables 1 and 2 present final measures of consensus for the elements of relapse from round three judged as essential and very important.

Table 1. Elements of relapse judged essential (median score 1).

| Element | Semi- inter-quartile range* |
|---|---|
| **Behavioural** | |
| *My urge has returned and I can't control it* | 0.5 |
| **Interpersonal** | |
| *Gambling is affecting my work and social behaviour* | |
| *(e.g. Leaving work early to gamble ...gambling during breaks)* | 0.5 |

*Values of 0.5 or less indicate strong group consensus.

Table 2. Elements of relapse judged very important (median score 2).

| Element | Semi- inter-quartile range* |
|---|---|
| **Cognitive** | |
| I believe that gambling is an option to solve a problem | 0.5 |
| I'm thinking about gambling more than before (pre-occupation with gambling) | 0.5 |
| I am gambling again, I'm thinking about gambling and I feel like I want to gamble again | 0.5 |
| **Behavioural** | |
| I have reduced alternative leisure activities to gambling activities | 0.125 |
| I tell lies to myself and others about my gambling | 0.5 |
| I'm gambling more than I think I should | 0.5 |
| I have disengaged from non-gambling activities | 0.5 |
| **Interpersonal** | |
| I am experiencing personal conflict about or related to my gambling | 0.125 |
| I have been emotionally or physically absent with significant others as a result of a pre-occupation with gambling | 0.5 |
| I have withdrawn from supportive social networks | 0.5 |

*Values of 0.5 or less indicate strong group consensus.

Tables 3 and 4 present final measures of consensus for the predictors of relapse from round three judged as very important and important. There were no predictors ranked as essential.

Table 3. Predictors of relapse judged very important (median score 2).

| Predictor | Semi- inter-quartile range* |
|---|---|
| **Psychological** | |
| **Distal**** | |
| Impulsivity | 0.125 |
| **Psychobiological** | |
| **distal** | |
| Affective disorder, anxiety disorder and substance use | 0.5 |
| Lack of frontal lobe disinhibition | 0.5 |
| **proximal*** | |
| Negative affective state | 0 |
| Stress reactivity | 0.5 |
| Affective instability | 0.5 |
| Intoxication with drugs or other substances | 0.5 |
| **Social and Environmental** | |
| **Distal** | |
| Access to money | 0.5 |
| Number, proximity and types of gambling venues (opportunities to gamble) | 0.5 |
| **Proximal** | |
| High risk situations | 0 |
| Access to money | 0.5 |
| Specific learnt cues | 0.5 |
| Lack of access to supportive social support networks | 0.5 |
| Lack of involvement with supportive social networks | 0.5 |

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**Treatments**
**distal**

| | |
|---|---|
| *Co-morbidities identified* | 0 |
| *CBT-cue exposure +/- response prevention* | 0.5 |
| *Stage of treatment achieved* | 0.5 |
| *Voluntary help seeking v/s other motivating factors* | 0.5 |
| *Avoidance strategy v/s mastering urge* | 0.5 |
| *Previous episodes of relapse* | 0.5 |
| *Time since completing a treatment episode* | 0.5 |
| *CBT-avoidance and distraction focused* | 0.5 |
| **proximal** | |
| *Co-morbidities addressed* | 0.125 |
| *Motivation* | 0.5 |
| *Treatment dose – homework done (hours)* | 0.5 |
| *Relationship with treatment provider/therapist* | 0.5 |
| *Stages of change (treatment readiness)* | 0.5 |

*Values of 0.5 or less indicate strong group consensus, ** distal indicates factors which that are underlying, innate or long term, *** proximal indicates immediate or current factors.

Table 4. Predictors of relapse judged important (median score 3).

| Predictor | Semi- inter-quartile range* |
|---|---|
| **Psychological** | |
| **distal**** | |
| *Anxiety traits* | 0.25 |
| *Peer and family norms* | 0.25 |
| *Locus of control* | 0.5 |
| *Neuroticism, psychoticism* | 0.5 |
| *Sensation seeking* | 0.5 |
| *Avoidant coping styles* | 0.75 |
| **proximal***** | |
| *Response to social and cultural cues (internal and external)* | 0.125 |
| *Major cultural/social events (triggers)* | 0.125 |
| *Anxiety states* | 0.5 |
| *Change in coping capacity* | 0.5 |
| *Peer pressure* | 0.5 |
| *Recurrence of cognition (erroneous)* | 0.5 |
| *Positive affective state* | 0.5 |
| *Grief and loss* | 0.5 |
| *Angry with self / angry with others* | 0.5 |
| *Social isolation* | 0.625 |
| | |
| **Psychobiological** | |
| **distal** | |
| *Personality disorders* | 0.5 |
| *Pre-existing mental Illness* | 0.5 |
| **proximal** | |
| *Internal cues leading to physiological changes* | 0 |
| *Environmental cues leading to physiological changes* | 0.5 |
| *Environmental cues leading to changes in expectations* | 0.5 |
| | |
| **Social and Environmental** | |
| **distal** | |
| *Role models* | 0.5 |
| *Advertising inducements* | 0.5 |
| *Gambling culture* | 0.5 |
| **proximal** | |
| *Inducements* | 0.5 |

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**Treatments**
**distal**

| | |
|---|---|
| *Episodes of treatment (number)* | 0.5 |
| *Inpatient treatment episodes (individual help)* | 0.5 |
| *Self-exclusion from venues* | 0.5 |
| *General counseling* | 0.75 |
| *Other* | 0.75 |
| **proximal** | |
| *External motivator / coercion by others rather than personal decision* | 0.25 |

*Values of 0.5 or less indicate strong group consensus, ** distal indicates factors which that are underlying, innate or long term, *** proximal indicates immediate or current factors.

As can be seen in Tables 3and 4 there was considerable overlap in the items predicting relapse and internal inconsistency was evident within the list. For example impulsivity (Table 3) ranked as "very important" and sensation-seeking (Table 4), which in the literature is consistently discussed as one of the personality traits related to impulsivity, was ranked at a lower level of "important". Another example was anxiety disorders, which together with affective disorder and substance abuse ranked as "very important" (Table 3), yet anxiety state again was ranked lower in Table 4. Examples of overlap, repetition and redundancy led to the retaining of "important" and "very important" elements and not "less important" or "unimportant" elements.

**Definitions of lapse and relapse**

The global definition of relapse was provided to Delphi participants to guide their consideration of the alternative definitions of lapse. Table 5 shows the consensus reached at the conclusion of round three. As can be seen there is a reasonable degree of consensus, but it is far from universal. These results were put to the review group of experts at the Auckland "Think Tank". After discussion there was consensus that both the terms "harm" and "loss of control" were subjective and open to wide variation and interpretation. This was especially a problem if the purpose of the project was to provide definitions that will be acceptable, interpretable and able to be validated, internationally.

For these reasons consensus was reached that the definitions should be able to be quantified. This issue had also been commented on by a number of the respondents in rounds 2 and 3 of the consultation. Debate occurred around what or how many episodes of gambling constituted a lapse or relapse. Instead of trying to quantify the amount of money or time spent in an episode, in a lapse or relapse, the most pragmatic approach was considered to be the description of the critical issue; namely the episode itself.

Table 5. Definitions of Lapse.

| Definition | Percent of ratings for round 3 (round 2 percent below) | | |
|---|---|---|---|
| | **Least ap'riate** | **appropriate** | **Most ap'riate** |
| **Definitions for lapse where abstinence had been the goal.** | | | |
| 1. *Lapse is a single gambling episode after a period of abstinence that does not cause harm to the individual, significant others or the community.* | 5% (5%) | 28% (36%) | 67% (59%) |
| 2. *Lapse is a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode.* | 39% (36%) | 50% (55%) | 11% (9%) |

| | | | |
|---|---|---|---|
| 3. *Lapse is a single gambling episode after a period of abstinence that does not involve prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.* | 56% (41%) | 39% (45%) | 5% (14%) |

**Definitions for lapse where controlled gambling had been the goal.**

| | | | |
|---|---|---|---|
| 1. *Lapse is a re-occurrence of a gambling episode (or pattern of gambling) that does not cause harm to the individual, significant others or the community after a period of controlled gambling and is not the start of a relapse.* | 29% (40%) | 30% (15%) | 41% (45%) |
| 2. *Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not cause harm to the individual, significant others or the community.* | 6% (16%) | 44% (63%) | 50% (21%) |
| 3. *Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve an ongoing or prolonged loss of control beyond the episode.* | 35% (38%) | 47% (57%) | 18% (5%) |
| 4. *Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve a prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.* | 47% (40%) | 35% (40%) | 18% (20%) |

This led to the position that:

1. With abstinence as the goal a lapse was defined as: "a single episode of gambling after a period of abstinence," and relapse was defined as "more than a single episode of gambling after a period of abstinence."
2. Similarly, for controlled gambling, a lapse was defined as: "a single episode of gambling over and above that defined by the client as controlled gambling," and relapse as: "more than one episode of gambling over and above that defined by the client as controlled gambling."

**Measurement scale selection**

Results from the Delphi Study guided the selection process of self-report psychometric rating scales for a prospective Observational Study. Based on the Delphi results, the project team in consultation with members of the Auckland Think Tank expert panel selected validated measurement instruments for both outcome measures of relapse and predictors of relapse. The goal was to minimise total number of study questions while simultaneously maximising potential for eliciting high quality data from study participants. The process of scale selection is described in the Observational Study section of this Final Report.

**Conclusions**

Overall the Delphi Study benefited from substantial contributions from a wide representation of international experts in the field of problem gambling. Significant consensus about the range of elements and potential predictors of relapse in problem gambling was obtained. However, there still remains a need for further research to achieve a truly international consensus about the definitions and predictors of relapse and lapse in problem gambling in light of the findings of the final round of the Delphi process and the Observational Study. The quantification of relapse by the expert panel has made it possible to include these definitions and outcome measures in the prospective study (part 4 of the relapse project) and to examine the list and provisional hierarchy of predictors of relapse in the Focus Group Study (part 3 of the relapse project).

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# 4. A FOCUS GROUP STUDY

## Introduction

There were only 3 qualitative studies on relapse in problem gambling found in the literature (see Literature Review). They suggest that negative affect may both initiate a gambling relapse and also be predictive of delay to gambling relapse. It was also suggested that there is a process that develops to engender the problem gambling state and that maintains it in a cycle of repeated lapses and relapses, and which can be managed or ceased by the use of treatments and positive changes in people's lives. The presence of negative affect including stress, conflict and negative social pressure, emotional lows, boredom and the need for escape from these, posed considerable risks for relapse. The presence of mental health co-morbidity such as PTSD, past childhood trauma and sorrow also posed a risk factor for some. Withdrawal and the stigma associated with the addiction were factors of importance for others in increasing a vulnerability to relapse.

Emotional highs and peer pressure also initiated relapse and were amongst environmental triggers that enticed people to engage in addictive behaviours. The qualitative studies all provided data on common protective factors that reduce the risk of relapse. These included the use of coping strategies, self-efficacy and self-esteem; existential issues such as involvement, quality of life, spirituality and the belief in a higher power; the availability of affective and social support; and the acquisition of relapse prevention skills and knowledge about the drug or addictive behaviour.

As these findings were not matched in the quantitative literature a low category of relationship could only be allocated to these factors. In the Delphi Study, all these factors achieved high interquartile ranking by the experts consulted. As such, particular attention needed to be paid to these factors in this empirical study.

This report provides data about the predictors and processes involved in episodes of relapse acquired from clients, significant others and workers with direct experience of gambling relapse. It describes the processes involved in relapse and concludes by providing a framework for conceptualising this process. It is an extensive piece of work that is argued in detail in the full report of the Delphi Study. This synopsis presents the major findings, but the data upon which the conclusions have been reached can be found in that report.

## Methodology

This study was the third component of the relapse project that sought to address "the relapse process in problem gamblers." The first focus group was held early in the project (see Figure 1, Part 2 above), informed only by the early part of the Literature Review and the remaining groups were held during the Delphi process. The data analysis was undertaken separately from that of the Delphi process, but the findings of that part of the project became available prior to the end of the focus group analysis and contributed to the focus groups analysis.

A qualitative research design was selected for this part of the project because it provided the ability to describe and examine a social phenomenon using the rich information obtained from problem gambling treatment providers, counsellors and clients and their significant others (Patton, 1990). The aim was to try to enquire into what these observers of relapse from close quarters would say about relapse as a phenomenon that had been experienced or observed by them, or what they had been told about it by clients and relatives. As the project aimed to try to better understand predictors of relapse and the allocation of an hierarchy to these, it was considered that those closest to relapsing (clients and significant others) and those trying to help them (therapists and counsellors representative of available treatment agencies) would be

in the best position to provide information about their experiences of relapse from multiple perspectives.

The conduct of the groups was based on the guide for the conduct of focus group research and they were conducted in a planned and standardised fashion (Breen, 2006). Two research staff conducted the focus groups. The interview guide is included in the full Focus Group report. All the groups were recorded using an MP3 Sony Walkman. There were no missing sections or fragments of conversation. Facilitators also made notes about pertinent issues during the focus group discussions.

Analysis of the raw text used a formal grounded theory methodology (Strauss and Corbin, 1990). Open coding was complete once each component of verbal data had been named. Axial coding involved the aggregation of open codes into categories of data or themes. The open codes were reviewed and grouped, and were then put back together in new ways as more data was analysed within, from and between successive groups (Strauss and Corbin, 1990). For example in the first group there were 12 comments about "urge" and "cues". This clearly led to the categorisation of "urge" as one of the key themes in the data set. This helped to identify concepts both at an individual focus group level and across all four groups. This process of analysis involved looking for trends and patterns that occurred across each focus group. The analysis began with putting together the raw data to determine an overall picture of the process so an analysis could be made (Krueger, 1994).

Examination of the axial codes and the researchers' familiarity with the literature allowed them to begin to generate hypotheses about patterns that were emerging. These patterns constitute derived data from the open and axial codes. As such it appears as if new data is being introduced by the researchers, when in fact these data emerge from the process of constant comparison and hypothesis generation (Patton, 1990). These hypotheses concluded the analyses of each of the principal themes that came from the focus groups, in-depth discussions by the researchers, comparison with the literature and the Delphi Study and further review of the identified codes. Thereby the data was reorganised in new ways, connections were made between categories, and new themes were identified, validating the relationships and refining the categories, as described by Patton (1990). An example of this process was that there were a number of times that sequences of events were described by participants, suggesting that relapse was a sequential process wherein one event triggered another. Again comparisons were made with the literature, resulting in the modification of the interpretations that were being made by the researchers. This process of data reduction helped to sharpen, sort and organise the data so "final" conclusions could be made (Miles and Huberman, 1994), and continued until theoretical saturation was achieved with each category (Strauss and Corbin, 1990). For example, it was surprising that co-morbidity did not appear to be as important as had been anticipated. It became clear that this was because it appeared to be acting through a number of other factors, especially the negative affective states in problem gamblers when they are so vulnerable to relapse.

A formal audit of the research process was also conducted by an independent researcher experienced in qualitative research. This is included in the Focus Group Report.


## Results

There was a total of 36 participants comprising 11 current or former problem gamblers, 5 significant others and 20 workers from gambling treatment agencies. The 11 problem gamblers comprised 5 clients from SGTS and 4 from PA, including one couple, and 2 from Consumer voice. The 5 significant others were associated with the SGTS unit. Clients and significant others were represented from rural and urban areas. There were a total of 20 workers, 11 with a cognitive behavioural therapy (CBT) orientation, and 9 NGO and referral

service workers comprising 3 social workers, 2 nurses, 2 counsellors and 2 financial counsellors, including 2 Indigenous agency workers. Overall it was considered that the groups were representative of the clients and workers as seen in the wider range of services provided for those affected by problem gambling in South Australia.

The transcripts of the groups comprised the raw data, which was broken down into individual statements relevant to relapse in problem gambling. These open codes were conceptualised and named individually by the principal researcher (JO). In order to maximise reliability this was independently checked (RP). This person had not participated in any of the focus group interviews. Where disagreement occurred discussion was held and a joint assignment of a code was made (Miles and Huberman, 1994). In this process, code-to-sentence matches should occur in at least 80% of cases to claim high reliability (Breen, 2006). Inter-coder reliability was calculated for each focus group and for the four focus groups as a whole; this was calculated at 84.8% between the two coders.

## Open and axial coding

During the first round of coding, no new data emerged after coding of the third focus group which suggested that the data was saturated (Strauss and Corbin, 1990) and a total of 27 themes relating to predictors of relapse were identified from a total of 622 open codes. These are shown in Table 6.

Table 6. Initial open coding of data points for each predictor of relapse across the groups.

| Open codes | SGTS Workers | SGTS clients | NGO workers | NGO consumers | Total number of items |
|---|---|---|---|---|---|
| Erroneous cognitions about gambling | 13 | 18 | 27 | 56 | 114 |
| The intervention | 49 | 18 | 12 | 8 | 87 |
| Urge to gamble | 16 | 10 | 11 | 33 | 70 |
| Social networks | 8 | 22 | 8 | 27 | 65 |
| Stress | 15 | 2 | 8 | 8 | 33 |
| Mental health Co-morbidity | 15 | 2 | 5 | 6 | 28 |
| Motivation | 6 | 3 | 6 | 11 | 26 |
| Escape | 4 | 1 | 8 | 9 | 22 |
| Theoretical models/ machine design | 11 | 1 | 4 | 5 | 21 |
| Triggers | 2 | 5 | 8 | 4 | 19 |
| Environmental factors | 13 | 2 | 1 | 1 | 17 |
| Financial stress | 3 | 7 | 3 | 3 | 16 |
| Loneliness | 4 | 2 | 6 | 4 | 16 |
| Addiction | 1 | 2 | 6 | 6 | 15 |
| Incentives to gamble | - | 4 | 7 | 2 | 13 |
| Shame | 0 | 6 | 3 | 0 | 9 |
| Culture | - | - | 8 | - | 8 |
| Events positive and negative | 1 | 1 | 2 | 4 | 8 |
| Boredom | 0 | 2 | 1 | 5 | 8 |
| Gender | 6 | - | - | - | 6 |
| Personality | 4 | 2 | - | - | 6 |
| Religion | - | - | - | 6 | 6 |
| Physical health problems | - | 1 | 2 | - | 3 |
| Neurophysiology | 2 | - | - | - | 2 |
| Access to services | 2 | - | - | - | 2 |
| Stigma | 1 | 1 | - | - | 2 |
| **Total** | **176** | **112** | **136** | **198** | **622** |

Axial coding and constant comparative analysis led to the reduction of these 27 primary themes into 6 key themes which appeared to be describing a process of relapse. This is shown in Table 7, where the six themes are organised indicating the sequence of the process rather than the numeric hierarchy of the factors.

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Table 7. Key themes in the relapse process.

| Theme | Number of open codes allocated |
|---|---|
| Environmental factors | 30 |
| Negative affective states | 108 |
| Cognitions | 139 |
| Urge to gamble | 104 |
| Social support | 95 |
| Intervention | 138 |
| **Total** | **622** |

**Constant comparative analysis and hypothesis generation**

Table 6 shows that these included negative affective states and environmental factors, which appeared to initiate the relapse process; cognitions and urge, which appeared to push the problem gambler to the point of relapse; and the quality of relationships (social support) and successful interventions, which appeared to pull the problem gambler away from the point of relapse. Table 7 shows the 18 specific hypotheses that were generated in this analytic process.

Table 7. The hypotheses generated in the data analysis.

| Factor | No | Hypotheses |
|---|---|---|
| External | 1 | Environmental factors provide triggers for relapse back to gambling. |
| | 2 | There are multiple operant rewards in gambling venues which shape gambling behaviour and make relapse more likely. |
| Negative affects | 3 | In some problem gamblers the presence of negative affective states initiates a sequence of events that increases the risk for relapse. |
| | 4 | Negative affective states secondary to gambling problems create a vicious circle where repeated relapse is likely. |
| Cognitions | 5 | Cognitions can directly and indirectly increase or decrease the intensity of the urge to gamble and the likelihood of relapse. |
| | 6 | The increasing arousal associated with an urge to gamble initiates a process of illogical cognitions about winning and a suspension of critical thinking about anticipated gambling resulting in relapse. |
| Urge | 7 | Treatment that effectively manages the urge will lead to the return of critical thinking processes and reduce the risk of relapse. |
| | 8 | There is a sequence of mental events involving the urge to gamble that increases or decreases the intensity of the urge, arousal and the risk of relapse. |
| | 9 | The intensity of urge and physiological arousal fluctuates over time. |
| | 10 | Urge extinction is the most effective in reducing the risk for relapse. |
| | 11 | The intensity of the urge or physiological arousal becomes such that cognitive functions become affected. |

| Social support | 12 | All positive social support acts to reduce the vulnerability to relapse. |
| | 13 | Relationship disharmony and negative social support can trigger relapse. |
| Interventions | 14 | Interventions based on a belief in supportive approaches leads to a reduction in relapse. |
| | 15 | Motivation of a client to complete treatment reduces relapse. |
| | 16 | Urge exposure and response prevention based on the belief that gambling is a conditioned behaviour demonstrates that it can be treated to urge extinction and mastery of the urge, at which time relapse is reduced or eliminated. |
| | 17 | Interventions based on the belief that gambling is an addiction affect people for life. |
| | 18 | The lifelong ongoing maintenance of vigilance is central to management of problem gambling for as long as the urge to gamble is present so that cognition remains in tact and the risk of relapse is reduced. |

Each of these themes were examined in detail. This is discussed in the Focus Group Report in summary form, and in detail in Appendix 9 of that report.


**Data synthesis**

The final task in the analysis of the data was to integrate these findings as a whole. To accomplish this, required there to be one or more hypotheses that addressed the findings in a way that assisted in understanding the phenomenon being studied.

There were a total of 18 hypotheses generated to explain the relationships seen within each of the 6 principal factors involved in relapse by constant, comparative analysis. These hypotheses can in fact be seen to describe a process of relapse as follows:

There is an initiation of the process by means of external environmental (H1) or by internal affective triggers (H3), and these may be precipitated by negative social conflict that evokes negative affects (H13). This initiates a sequence of mental events and behaviours that may lead to relapse (H8) and is modified by a number of factors which "push" the sequence towards relapse (H2, H4, H5, H6, H11, H17). There are also a number of factors that act to "pull" the sequence away from relapse (H18, H7, H10, H12, H14, H15 and H16).

The final hypothesis describes the fluctuating cognitive, physiological and emotional state of the problem gambler during relapse where the "push" and the "pull" are involved in an approach – avoidance conflict in respect of the urge to gamble (H9) and whether or not to relapse into gambling behaviour. This final synthesis summarises the results in a single overarching hypothesis of the results which describes the conclusions by the researchers:

*Relapse comprises a sequence of mental events and behaviours which evolves over time during each relapse episode which is modified by factors that "push" this sequence towards and others that "pull" problem gamblers away from relapse in their gambling behaviours.*

There are risk factors that together "push" the problem gambler towards relapse and risk factors that together "pull" the problem gambler away from relapsing. All these risk factors act concurrently in a complex, highly specific and unique way for each problem gambler. This complex process is discussed in detail in the Focus Group Report (Section 5). It is also shown diagramatically in the last section of this Report, where it is proposed as the first specific model for relapse in problem gambling. The process is briefly described here.

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*The relapse process: initiation of relapse*

There are three steps in the initiation of a relapse event: an enticing or aversive trigger mediated by the problem gambler's emotional response to the trigger, ending at the point where thoughts about and the urge to gamble have been aroused and become the focus of attention of the problem gambler.

*The "push" factors towards a relapse*

Cognitions and urges are the key facilitators that "push" the relapse process. They lead to increasing arousal for the problem gambler. Erroneous cognitions relating to the outcomes of gambling act as powerful stimuli for the rise of the urge to gamble, which is accompanied by increasing cognitive, affective and autonomic arousal.

There appears to be a critical point in the relapse process when arousal is so intense that the problem gambler decides to gamble, possibly in order to reduce the dysphoria resulting from the intense arousal. The implementation of the decision appeared to occur at a variety of times:

1. in an "all or none" single decision
2. as a stepped decision to firstly place oneself in an "at risk" situation for gambling making relapse highly likely, where often, the final decision to engage in gambling behaviour was made, prior to the relapse behaviour per se
3. at the decision to gamble at some future time (e.g. when money would be available).

- Once this decision has been made the problem gambler appears to develop a cognitive set where there are significant alterations in cognitive processing, including impairment of self-observation, cognitive bias with impairment of memory for prior negative consequences from gambling behaviour, impairment of critical thinking and a suspension of "the will" which was described as having loss of control.
- Once the problem gambler engages in the gambling behaviour, this altered cognitive state is intensified and it becomes much more difficult for the problem gambler to disengage from gambling behaviour because of this altered state of consciousness. This is described as "being in the zone", a state that appears to have some of the characteristics of dissociation (Diskin and Hodgins, 1999).

For some, an immediate, uncontrollable urge cannot be resisted and has to be immediately satisfied, for others the decision could be made to relapse but to defer the gambling behaviour and for others, a struggle is initiated of "push" and "pull" factors in a classical approach-avoidance conflict that often culminates in relapse behaviour.

*The "pull" factors away from relapse*

Factors that "pull" problem gamblers away from relapse include treatment interventions and beliefs, cognitive factors, avoidance, distraction, memories, fear and images of previous negative consequences, and positive social support. Maintaining vigilance is the central issue in the protective "pull" factors in a high risk situation or threat of lapse or relapse. The capacity to remain aware that relapse could occur at any time is the key to successful management of the temptation to gamble and to maintain a low level of arousal, excitement and urge so that normal cognitive processing remains possible.

*Management or "cure"*

There appeared to be two fundamentally different ways of trying to manage relapse: relapse prevention and management by maintaining vigilance and avoiding getting caught up in the process of relapse or by confronting the urge by graded exposure, and response prevention, which appeared to result in the extinction of the urge with the confidently asserted belief by those participants that they no longer had a problem. Extinction of the urge to gamble seemed to eliminate the relapse process for some, suggesting the possibility of "cure".


*Relapse in an Indigenous community*

An Aboriginal health worker described relapse to problem gambling in a large rural centre, as occurring by the community as a whole in a setting where the community was grieving. This was a very different process than that described above and needs confirmation and further investigation.


## Discussion

The focus group methodology has served as a valuable tool in eliciting rich and detailed data concerning these predictors of relapse. The findings of this study must be considered to be of a preliminary nature, however it is one of the few qualitative studies that we have found in the literature about gambling relapse that has been rigorously carried out and reported in detail. It is the only study to specifically explore the factors that initiate, perpetuate and impede the process of relapse in problem gambling. It also describes the cognitive processes during relapse that results in a person continuing to choose illogical behaviour over and above the consciously stated desire to stop. The validity and reliability of the findings from this study was maximised by using a structured format and auditing the research process (see the Focus Group Report for the audit report).

With the small numbers of subjects generalisability is clearly limited. Subject selection and recall bias are clear issues in all such qualitative studies. There are alternative specific therapies other than CBT with urge exposure and response prevention for which findings may be different. This methodology has also pieced together a purported process that needs to be verified by in-depth interviews with individuals to see whether such a process actually happens as has been described.

The derivation of this empirical model of relapse is described in the results section in detail. It has clear face validity and complements the well-known relapse prevention model of Marlatt and Gordon (1985), pathways to relapse (Blaszczynski and Nower, 2002a), the dynamic model applied to alcohol by Witkiewitz and Marlatt (2004), and our understanding of cognitive behavioural models of the genesis of addictive behaviours. It does, however, suggest that an altered state of cognitions develops for problem gamblers, which may be a learned decision-making psychological set. These findings need to be confirmed in other studies, but there are a number of new areas for research and possible harm minimisation interventions that could be considered. The applicability of these findings will be explored in the further discussion of models of relapse in problem gambling later in this report.

A number of recommendations arise out of this study, which will be taken together in the conclusion of this report.


## Conclusions

This research has helped to gain a deeper understanding of the process of gambling relapse, which has been shown to involve a sequence of mental events as well as being influenced by modifying factors that lead either to "push" towards relapse or the "pull" from relapse.

Additionally, this study provides a new insight into the predictors of relapse, highlighting six key groups of predictors of relapse in problem gambling: urge, cognitions, negative affective states, environmental factors, social support and intervention type. It also reinforces the efficacy of current treatment options for problem gambling and relapse prevention strategies. However, therapy aimed at urge extinction appeared to enable some clients to think clearly and not enter altered cognitive states, resulting in long term resilience against a gambling relapse, and possibly suggesting "cure". These findings have important implications for research and for future directions in understanding and treating such problem gamblers more effectively.

# 5. OBSERVATIONAL STUDY

## Introduction

The purpose of this study was to conduct "a prospective Observational Study of predictors for relapse in treatment-seeking problem gamblers, taking into account the findings of the Literature Review, the consensus definition of relapse and the Focus Group Study" (GRA project brief). The goal was to empirically identify predictors of relapse in problem gambling using a quantitative methodology. Specifically, the goal was to model the odds of a study participant experiencing a relapse in problem gambling following a period of remission as a function of potential predicting variables. The preliminary studies ensured that the present study was grounded in the experiences of consumers and experts. The findings of this Observational Study may help identify appropriate interventions and support systems to reduce the negative health and social consequences of those who are vulnerable to relapse in problem gambling.

## Method

### Participants

The participants in this study were adults who, at baseline, were treatment-seeking for problem gambling. Recruitment was initiated by research staff contacting gambling help services in South Australia with information about the study. All services contacted agreed to participate and the following subjects (N=158) were referred: Statewide Gambling Therapy Service (SGTS, n = 106; 67.1%); Gambling Helpline (GHL, n=31; 19.6%); Pokies Anonymous (PA, n=11; 7%); Offenders Aid and Rehabilitation Service Gambling Support Service (OARS, n=5; 3.2%); and Relationships Australia (RA, n=5; 3.2%).

### Design and procedure

A prospective cohort design was used to investigate predictors of relapse in problem gamblers, which followed participants over a 12 month time period. Baseline measures were collected following consent to participate in the study. Follow-up measures comprised 1 and 3 months for all participants, for up to 12 months (March 2009), depending on recruitment time into the study (March 24th to September 22nd 2008). The STROBE (Strengthening the Reporting of Observational Studies) guidelines (Vandenbroucke et al., 2007) were used to guide the reporting of this study, including participant flow (Figure 2).

The selection of measures for the Observational Study was based on findings from the Delphi process and recommended by the "Think Tank" experts. The following predictor and outcome measures were used at 1, 3, 6 and 12 month follow-up.

*Outcome variables*

Outcome status was represented by three items: remission, relapse, and continuing to problem gamble. All participants were measured to be either in remission (non-problem gambling), or continuing to problem gamble at baseline. At follow-up time points of 1, 3, 6, and 12 months, outcome status was dependent on preceding assessments and participants were classified as either in remission; continuing to problem gamble; or relapsed if the individual had returned to problem gambling following a remission period. To compare two alternative measures of outcome derived from the Delphi process, assessments were conducted at each point in time using: (1) the Victorian Gambling Screen (VGS)[1] self-harm subscale, and (2) self-reported gambling behaviours as quantified by the Delphi definition of relapse.

(1) VGS

The selection process of a validated measure to classify an individual's gambling status at each point in time was based on the final elements of relapse prioritised as "essential" and "very important" in the Delphi Study (Table 8). Final selection of the Victorian Gambling Screen was based on the scale's following properties: (i) items on the self-harm subscale relate to the person's experiences in the previous 4 weeks and therefore enhance sensitivity to relapse and temporal associations; (ii) representation of all domains of elements in the final list (behavioural, cognitive, and interpersonal factors); and (iii) a validated cut-off point indicative of problem gambling. Of other validated instruments that classify problem or pathological gambling, neither the Canadian Problem Gambling Index (CPGI) nor the South Oakes Gambling Screen (SOGS) satisfied criteria (i) and (ii). Other potential measures of relapse such as the Gambling Urge scale (GUS) or Work and Social Adjustment Scale (WSAS), identified for some items in the elements of relapse in Table 8, were also potential predictors of relapse and therefore excluded.

The VGS is a self-reported questionnaire measuring the extent to which gambling behaviour has impeded the client's life. The screen comprises three sub-scales (enjoyment of gambling, harm to partner and harm to self) with a total of 21 items. For purposes of this study, only the harm to self sub-scale was used as an outcome measure. This sub-scale has been validated for use in Australia by Ben-Tovim, Esterman, Tolchard, Battersby and Flinders Technologies (2001). The harm to self sub-scale scores range from 0 = no harm to self to 60 = high harm to self. Concurrent validity indicates that the scale correlates very highly with the South Oaks Gambling Screen (SOGS) (R = 0.97), but extends the score range. To determine outcome status for this study, a cut-off score of 21 or higher (Ben-Tovim et al., 2001) identified a participant as either continuing to problem gamble or relapsed. A score less than 21 identified a person to be in remission from problem gambling.

(2) Based on the recommendation of the Think Tank expert panel, a numerical definition of lapse and relapse was used as a guide to including an outcome measure of relapse based on gambling frequency. In considering issues of statistical analysis based on the expected sample size and time frame, it was decided to combine the lapse and relapse criteria by asking if participants had gambled once or greater than once more than their goal. There is no simple questionnaire that has been validated that takes into account the goal of problem gamblers when they seek treatment. As such at each follow-up time point participants self-reported their gambling behaviours from the previous 4 weeks. Three questions pertaining to outcome status were asked:

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[1] Please note: The Victorian Gambling Screen (VGS) was developed by a team of researchers and clinicians at Flinders University led by Professor David Ben-Tovim after a competitive tender funded by the Victorian Casino and Gaming Authority. Professor Battersby was part of this team. There may be a perception of potential conflict of interest in the use of the VGS, although the VGS is the property of the Victorian government and is in the public domain. Hence, care was taken in the selection of the VGS on purely scientific grounds and in consultation with the entire research team.

(i) Are you currently aiming to be abstinent from gambling? (Yes/No);

When answering "No" the person was asked:

(ii) To what level are you aiming to limit your gambling? (Once a week/Twice a week/Three or more times a week/Daily).

(iii) How often did you gamble during the last 4 weeks? (Never/Once/Twice/Once a week/ Twice a week/Three or more times a week).

Participants answering "No" to question (i) and reporting gambling activity in question (iii) that exceeded their aims in question (ii) were categorised as either having relapsed or continuing to problem gamble.

Participants who answered "Yes" to question (i) and reported gambling activity in that time period were categorised as having either relapsed or continuing to problem gamble (depending on their previous assessment). Otherwise participants were categorised as being in remission.

Table 8. Final Delphi elements of relapse rated as "essential" and "very important" and selected rating scales.

| Element | Rating scale |
|---|---|
| **Behavioural** | |
| *My urge has returned and I can't control it* | Gambling Urge Scale (GUS) |
| *I tell lies to myself and others about my gambling* | Victorian Gambling Screen (VGS) |
| *I'm gambling more than I think I should* | VGS |
| *I have reduced alternative leisure activities to gambling activities* | Work and Social Adjustment Scale (WSAS) |
| *I have disengaged from non-gambling activities* | WSAS |
| **Cognitive** | |
| *I believe that gambling is an option to solve a problem* | Gambling Related Cognition Scale (GRCS) |
| *I'm thinking about gambling more than before (pre-occupation with gambling)* | VGS |
| *I am gambling again, I'm thinking about gambling and I feel like I want to gamble again* | GUS |
| **Interpersonal** | |
| *Gambling is affecting my work and social behaviour (e.g. Leaving work early to gamble…gambling during breaks)* | WSAS |
| *I have been emotionally or physically absent with significant others as a result of a pre-occupation with gambling* | WSAS |
| *I have withdrawn from supportive social networks* | WSAS |
| *I am experiencing personal conflict about or related to my gambling* | VGS, WSAS |

Baseline demographic variables: gender, age, marital status, highest education level, employment status, and living arrangement. Data for duration of gambling problem and type of gambling was also collected.

The selection of validated measurement scales as predictor variables was based on the final predictors from the Delphi Study rated as "very important" and "important" with strong group consensus (Table 9). Selected predictors were assessed as measurable in terms of validated

self-rating scale properties and minimal overlap within domains of psychological, psychobiological, and social and environmental factors.

Table 9. Final Delphi predictors of relapse and selected rating scales.

| Predictor | Rating scale |
|---|---|
| **Psychological** | |
| **distal-** | |
| *Impulsivity* | Arnett Inventory of Sensation Seeking (AISS) |
| *Anxiety traits* | Spielberger Trait Anxiety Inventory (STAI) |
| *Sensation seeking* | AISS |
| **proximal** | |
| *Anxiety states* | Depression Anxiety Stress Scale (DASS) |
| *Recurrence of cognition (erroneous)* | Gambling Related Cognition Scale (GRCS) |
| *Social isolation* | Multidimensional Scale of Perceived Social Support (MSPSS) |
| **Psychobiological** | |
| **distal-** | |
| *Affective disorder, anxiety disorder and substance use* | DASS, STAI, Alcohol Use Disorders Identification Test (AUDIT) |
| **proximal-** | |
| *Negative affective state* | DASS |
| *Stress reactivity* | DASS |
| *Affective instability* | DASS |
| *Intoxication with drugs or other substances* | AUDIT |
| *Internal cues leading to physiological changes* | Gambling Urge Scale (GUS) |
| *Environmental cues leading to physiological changes* | GUS |
| **Social and Environmental** | |
| **proximal-** | |
| *Lack of access to supportive social support networks* | MSPSS |
| *Lack of involvement with supportive social networks* | Work and Social Adjustment Scale (WSAS) |

## Results

Recruitment of participants was obtained mainly from help seeking problem gamblers. From a potential recruitment pool of 480 people contacting the Gambling Help Line and the treatment services directly, 158 people enrolled in the study over a 6 month period (Figure 2).

Figure 2. Participant flow chart for each stage of the study.
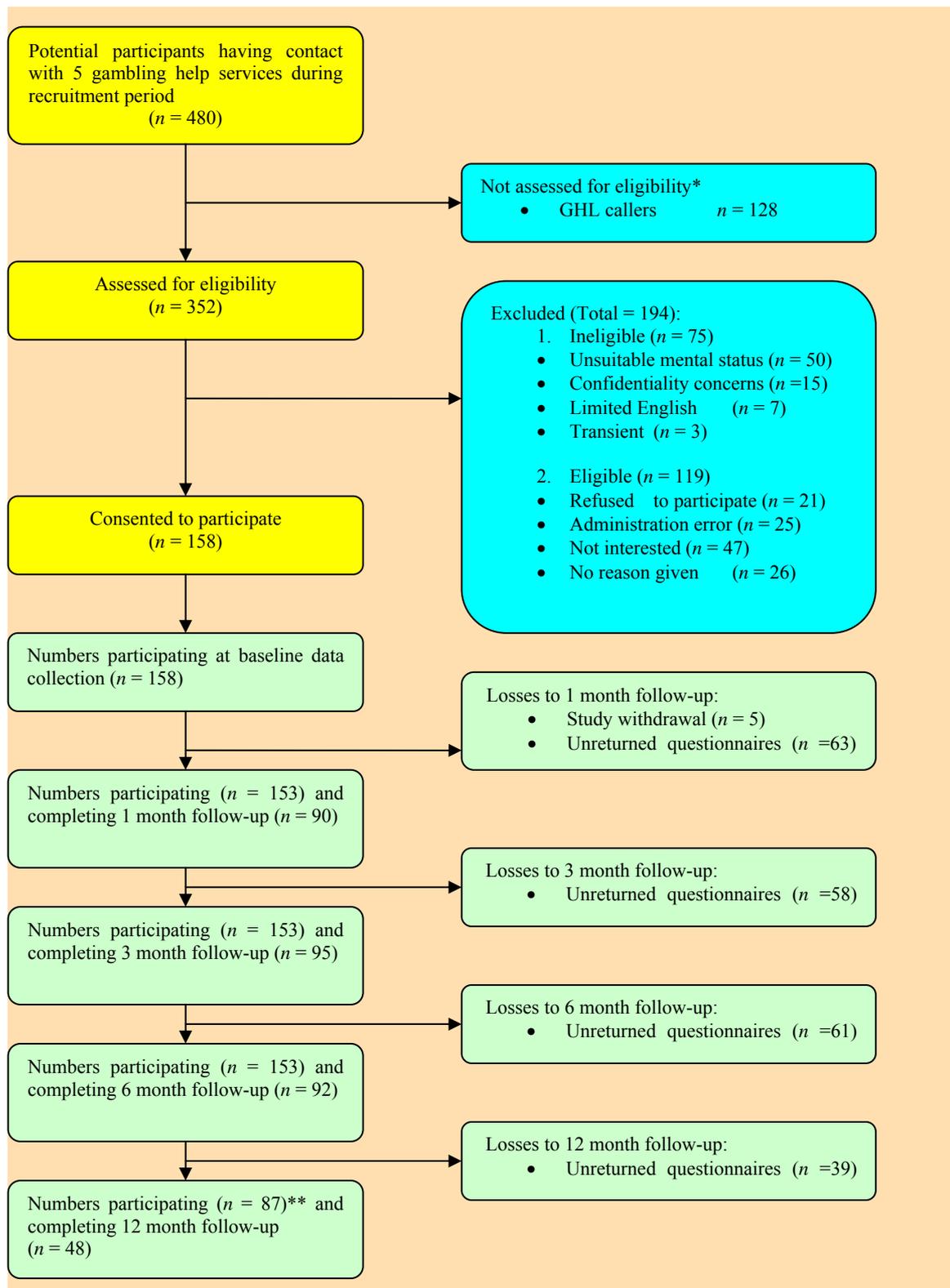


Figure 2. Participant flow chart for each stage of the study.

* This is an approximate figure based on quarterly report figures for the Gambling Helpline from April to September, 2008.
** Remaining participants (*n*= 66) received 6 month questionnaires as final follow-up.

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The dispersion or spread of participant's time engaged in the study is described using median scores and inter-quartile ranges (IQR) for each time point (Table 10). The IQR comprises 50% of the scores (or times in this case) between the $25^{th}$ percentile and $75^{th}$ percentile. Median and IQR values are analogous to a mean and standard deviation as measures of dispersion, however, they are less sensitive to extreme scores. Overall, median time for participants' enrolment in the study was 8.38 months with 50% of participants having times between 7 and 9.57 months (IQR= 2.57 months) and 25% less than 7 months. Patterns of completed measures for points in time included 116 (73.4%) with at least a 3 month follow-up, and 99 (62.7%) with at least a 6 month follow-up.

Table 10. Descriptive statistics of follow-up completion times.

| Follow-up time | *N* | Median (IQR)* |
|---|---|---|
| 1 month | 90 | 1.23 (0.4) |
| 3 months | 95 | 3.23 (0.5) |
| 6 months | 92 | 6.4 (0.7) |
| 12 months | 48 | 9.2 (1.2) |

IQR, Inter-quartile range expressed as months*

All questionnaires were tested for internal consistency at baseline and were found to be adequate, with Cronbach's alpha ranging from 0.69 to 0.96 for tests on all items in each scale.

**Demographic and baseline measures**

Demographic and clinical characteristics of the study cohort are presented in Table 11. When compared to previous normal population scores (Lovibond and Lovibond, 2004) baseline DASS means where higher for the depression, anxiety, and stress scales, and in the moderate severity range. Alcohol harm as indicated by the AUDIT showed that 29.3% were either using alcohol in a harmful manner or were alcohol dependent. Stratifying the VGS self- harm subscale with a cut-off at 21 (Ben-Tovim et al., 2001) classified 94.9% (*n* =150) participants as problem gamblers.

Table 11. Demographic and clinical characteristics of 158 problem gamblers.*

| Variable | Value |
|---|---|
| Age, mean ± SD, y | 44 ± 12.92 |
| Male sex | 85 (54) |
| Marital status | |
| Married/defacto | 63 (40) |
| Single | 55 (35) |
| Separated | 33 (21) |
| Widowed | 7 (4) |
| Highest education level | |
| Primary school | 2 (1) |
| High school | 88 (56) |
| TAFE/Trade qualification | 43 (28) |
| University degree | 24 (15) |
| Employment | |
| Full-time | 58 (37) |
| Part-time | 28 (18) |
| Not working | 50 (31) |
| Retired | 17 (11) |
| Student | 5 (3) |
| Living arrangement | |
| Alone | 36 (24) |
| Couple with dependent children | 29 (19) |

| | |
|---|---|
| Couple without dependent children | 38 (25) |
| Single parent | 15 (10) |
| Living with parents | 24 (16) |
| Sharing | 11 (7) |
| Primary form of gambling | |
| Gaming machines | 138 (87) |
| Duration of gambling problem | |
| < 2 y | 31 (20) |
| 2 - 5 y | 36 (23) |
| > 5 y | 87 (57) |
| Clinical measures, mean ± SD[a] | |
| GUS | 14.16 ± 11.52 |
| WSAS | 16.03 ± 9.73 |
| DASS-21: depression | 10.76 ± 6.35 |
| DASS-21: anxiety | 6.63 ± 5.65 |
| DASS-21: stress | 10.60 ± 6.01 |
| MSPSS | 48.88 ± 22.08 |
| VGS: self-harm subscale | 40.09 ± 11.46 |
| AUDIT | 6.07 ± 7.46 |
| AISS | 46.72 ± 7.65 |
| GRCS | 65.50 ± 25.03 |
| TAI | 53.86 ± 11.01 |

Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; DASS-21, Depression Anxiety and Stress Scale; MSPSS, Multidimensional Scale of Perceived Social Support; VGS, Victorian Gambling Screen; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of Sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory.

*Data are presented as number (percentage) unless otherwise indicated. Percentages not always based on 158 participants owing to missing data.

Overall, there were 34 baseline completers only (dropouts, 21.5%), with 124 participants (78.5) completing at least one follow-up measure (Table 12). Dropouts were more likely to be younger (p< 0.01), male (28 vs 6; $\chi^2_1 = 14.21$; $p < 0.01$), sensation seeking (AISS; p=0.02) and had greater trait anxiety (TAI; p= 0.05).

Table 12. Differences between dropouts and other participants.

| Variable | Baseline only ≥ mean ± SD[a] | 1 follow-up mean ± SD[b] | $t (p)^c$ |
|---|---|---|---|
| Age | 38.5 ± 11.42 | 45.51 ± 12.94 | -2.86 (<0.01) |
| GUS | 14 ± 8.62 | 14.21 ± 12.03 | -0.09 (0.93) |
| WSAS | 16.07 ± 9.24 | 16.02 ± 9.90 | 0.03 (0.98) |
| DASS-21 | 24.85 ± 16.42 | 28.86 ± 16.64 | -1.25(0.21) |
| MSPSS | 52.13 ± 22.01 | 47.99 ± 22.12 | 0.97 (0.33) |
| VAGS | 40.97 ± 10.27 | 39.85 ± 11.80 | 0.50 (0.61) |
| AUDIT | 7.82 ± 8.90 | 5.59 ± 6.98 | 1.55 (0.12) |
| AISS | 49.37 ± 7.50 | 45.99 ± 7.56 | 2.31 (0.02) |
| GRCS | 64.98 ± 23.73 | 65.64 ± 25.47 | -0.14 (0.89) |
| TAI | 50.62 ± 10.26 | 54.75 ± 11.08 | -1.95 (0.05) |

[a] $n = 34$; [b] $n = 124$; [c]Two-tailed.
Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; DASS-21, Depression Anxiety and Stress Scale; MSPSS, Multidimensional Scale of Perceived Social Support; VGS, Victorian Gambling Screen; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory.

**Main results**

Statistical modelling of predicting factors in problem gambling relapse processes were conducted with two independent measures of outcome: (1) Victorian Gambling Screen, and (2) changes in gambling behaviours. The final models for each of the outcome measures are summarised below and interpreted using odds ratios. For each significant predictor of relapse the odds ratio is presented as the probability of an event occurring (relapse or continuing to gamble) over the probability of remission. The degree of reliability for each odds ratio is reflected by the width of their confidence intervals where smaller is better.

*Victorian Gambling Screen*

This section provides the results of a final regression model when scores from the Victorian Gambling Screen were used to determine gambling status (remission, relapse, or continuing to gamble) at each point in time. To interpret effect sizes in Table 6 of significant predictors in the final regression model each significant variable at $P < 0.05$ is summarised, while holding all other variables constant, with odds ratios (and 95% confidence intervals) in the following paragraphs .

Table 13. Relative Risks and Outcomes for the Victorian Gambling Screen.

| Variable | OR[a] (95% CI) | |
| --- | --- | --- |
| | Relapse vs. Remission | Continuing vs. Remission |
| time | 1.23(1.03-1.47)* | 0.76(0.66-0.88)* |
| living arrangement | 1.98(0.41-9.65) | 0.49(0.17-1.40) |
| Gambling Urge Scale (GUS) | 1.29(1.12-1.49)* | 1.20(1.07-1.35)* |
| Multidimensional Scale of Perceived Social Support (MSPSS) | 1.00(0.96-1.04) | 1.02(0.99-1.05) |
| Gambling Related Cognitions Scale (GRCS) | 1.06(1.01-1.12)* | 1.08(1.04-1.13)* |
| Alcohol Use Disorders Identification Test (AUDIT) | 1.09(0.98-1.22) | 0.96(0.88-1.04) |
| Work and Social Adjustment Scale (WSAS) | 0.93(0.78-1.10) | 1.13(1.03-1.24)* |

* 95% confidence interval significant at $P < .05$

Time
For each one month change in time the odds of participants relapsing over remission increased by 23% while holding all other variables constant. In terms of confidence intervals the increase in odds of relapse over remission could be as low as 3% or as high as 47%. The odds of continuing to gamble over remission decreased by 24% with each one month change in time, and could be as low as 12% or as high as 34%.

Gambling Urge
The odds of participants experiencing a relapse over remission for each one unit increase on the Gambling Urge Scale increased by 29% and could be as low as 12% or as high as 49% while holding all other variables constant. For each one unit increase on the Gambling Urge Scale the odds of participants continuing to gamble over remission increased by 20% and could be as low as 7% or as high as 35%.

Gambling Related Cognitions
For each one unit increase on the Gambling Related Cognitions Scale the odds of participants experiencing a relapse over remission increased by 6% and could be as low as 1% or as high as 12%. The odds of continuing to gamble over remission with each one unit increase on the Gambling Related Cognitions Scale increased by 8%, and could be as low as 4% or as high as 13%.

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Work and Social Adjustment
For each one unit increase on the Work and Social Adjustment Scale the odds of a participant continuing to gamble over remission increased by 13%, and could be as low as 3% or as high as 24%.


*Changes in gambling behaviours*

This section provides the results of a final regression model when measures of each participant's gambling behaviours were used to determine gambling status at each point in time. Specific details of the odds ratios and 95% confidence intervals for the comparison of relapse and continuing to gamble categories with the remission category are presented in Table 14 and discussed in the following paragraphs. Effect sizes of each variable are interpreted while all other variables in the final model are held constant.

Table 14. Relative Risks and Outcomes for changes in gambling behaviours.

| | OR[a] (95% CI) | |
| --- | --- | --- |
| Variable | Relapse vs. Remission | Continuing vs. Remission |
| time | 1.26(1.11-1.43)* | 0.78(0.69-0.88)* |
| gender | 0.40(0.11-1.46) | 0.37(0.14-1.00) |
| Gambling Urge Scale (GUS) | 1.16(1.06-1.27)* | 1.09(1.02-1.17)* |
| Depression, Anxiety, Stress Scale (DASS-21) | 0.99(0.95-1.03) | 0.98(0.95-1.01) |
| Arnett Inventory of Sensation Seeking (AISS) | 1.01(0.93-1.09) | 1.05(0.99-1.11) |
| Gambling Related Cognitions Scale (GRCS) | 1.02(0.99-1.05) | 1.02(1.00-1.04) |
| Work and Social Adjustment Scale (WSAS) | 0.94(0.83-1.07) | 1.18(1.09-1.27)* |

* 95% confidence interval significant at *P* < .05

Time
For each one month change in time the odds of a participant relapsing over remission increased by 26% and could be as low as 11% or as high as 43% while holding all other variables constant. The odds of continuing to gamble over remission decreased by 22% with each one month change in time and could be as low as 12% or as high as 31%.

Gambling Urge
For each one unit increase on the Gambling Urge Scale the odds of participants experiencing a relapse over remission increased by 16% and could be as low as 6% or as high as 27%. The odds of participants continuing to gamble over remission increased by 9% and could be as low as 2% or as high as 17%.

Work and Social Adjustment
The odds of participants continuing to gamble over remission increased by 18% with each one unit increase on the Work and Social Adjustment Scale and could be as low as 9% or as high as 27%.


**Discussion**

The sample size, missing observations and duration of the study limit its generalisability, including the ability to distinguish between lapse and relapse processes. Nevertheless, the prospective study of relapse in a normal clinic population has demonstrated that gambling urge is an important predictor of relapse in gambling, using the definition of relapse as defined by the ''Think Tank'' experts.

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There were a number of other predictors of relapse that were excluded through the analysis that need further examination. Negative affect as measured by the DASS and co-morbidity with drinking featured as important variables that did not demonstrate statistical significance in the final analysis. This may have been due to missing values or sample size and warrants further consideration.

An important observation was that participant characteristics of being younger, having higher sensation-seeking scores, and male gender were significantly associated with a higher study dropout rate. These findings suggest that impulsivity and sensation-seeking needs further consideration, as the exclusion of these subjects at later stages of the analyses may have reduced relapse data over time.

## Conclusion

The Observational Study has clearly demonstrated that urge and gambling cognitions are central to episodes of relapse. Co-morbidity, negative affect and social support all failed to reach statistical significance, but only narrowly in a study with relatively low power. Further work is clearly required to further clarify the relapse process.

## 6. FINAL SYNTHESIS AND IMPLICATIONS FOR MODELS OF RELAPSE

## Introduction

This final part of the report will draw together all the findings in respect of predictive and protective factors in the relapse of problem gamblers. It also addresses the final aim of the project "Revision of the model of relapse in problem gambling based on the findings of these studies" (GRA project brief). It will conclude with comments about future directions clinically and for research. This section will focus upon the empirical findings in the Delphi, Focus Group and Observational Studies. It was not part of the brief for this project to provide a detailed review of aetiological models in problem gambling and other addictive behaviours, as that would be a full scale study in its own right.

## A hierarchy of factors in relapse

The data from the Observational Study do support the findings from the Delphi and Focus Group Studies and assists in arriving at some tentative conclusions as shown in Tables 15, 16 and 17.

As can be seen there is some consensus across the 4 studies in the relapse project concerning the major predictors of relapse. These include the following, ranked according to empirical evidence.

## Urge

The Delphi Study participants saw this as an important element of relapse, and perhaps therefore did not think it should be included as a predictor, but it is clearly the strongest predictor supported by the empirical data, both qualitative and quantitative. There is also some discussion of urge in the literature, and urge has some of the qualities of gambling expectancies and excitement, also addressed in the literature.

### Gambling cognitions

Again, the participants in the Delphi Study saw this as an important element of relapse and as one of the potential predictors, but not in the most important table. However, cognitions are strongly supported in the literature and empirically in both the Focus Group and Observational Studies.

### Negative affective states

This has clear support in the literature and in the Delphi Study. Empirically it is strongly supported in the Focus Group Study, but not in the final analysis of the Observational Study.

### External factors

These have been highlighted in the literature as precipitating relapse episodes, and were also recognised as important by the Delphi Study participants. There was good empirical evidence for their role in initiating the relapse process, but there was no data concerning external factors in the Observational Study.

Table 15. A comparison of predictors of relapse.

| *Predictors of Relapse* | | | |
|---|---|---|---|
| **Literature review** | **Delphi Study** | **Focus group study** | **Observational study** |
| Urge | | Urge | Urge |
| Reward dependence | Stress reactivity Affective instability | | Time |
| Disinhibition Impaired decision-making | Lack of frontal lobe inhibition Intoxication with drugs or other substances | | |
| Impulsivity Sensation-seeking | Impulsivity | | ?Sensation seeking |
| Gambling cognitions Gambling expectancies Excitement | | Gambling cognitions | Gambling cognitions |
| Negative affective states | Negative affective states Previous episodes of relapse | Negative affective states | ?Negative affects |
| Co-morbid psychiatric disorders (ASP; SUD; PTSD, sorrow and loss | Affective disorder, anxiety disorder and substance use | Subsumed into negative affective states | ?Alcohol |
| Gambling availability Peer pressure Environmental trigger | Access to money Opportunities to gamble High risk situations Specific learnt cues | External | ?Work |

### Co-morbidity

This has also been highlighted in the literature and in the Delphi Study where affective disorder, anxiety disorder and substance use were endorsed as very important. Alcohol use disorder as measured by the AUDIT just failed to reach statistical significance as a predictor in the Observational Study. In the Focus Group Study, co-morbidity appeared to act through the negative affects that they engendered.

**Measuring issues**

There were a wide number of other potential predictors suggested, but only time has empirical support. It may be that a number of these predictors are simply a description of two different points along a cycle of relapse when problem gambling is an established pattern of behaviour. For example peer pressure on a "Girls' night out to the casino" may result in anticipatory cognitions, which alternate between excitement and negative affects as winning and disastrous losses are recalled. These cognitions may then be followed by urge arousal that becomes increasingly intense and the sights and sounds of the EGM machines result in a relapse once in the venue. Thus different predictors could simply be descriptions of the relapse process over time.

Protective factors for relapse are shown in Table 16.

Table 16. A comparison of protective factors for relapse.

| *Protective factors for Relapse* | | | |
|---|---|---|---|
| **Literature review** | **Delphi Study** | **Focus group study** | **Observational study** |
| Treatment<br> Relapse prevention skills<br>Coping strategies<br>Knowledge | Treatment readiness<br>Treatment dose<br>Stage of treatment<br>CBT-cue exposure +/-<br>response prevention<br>Avoidance strategy v/s<br>mastering urge | Interventions<br>CBT-cue exposure and<br>response prevention<br>mastering urge | Treatment |
| | Time since treatment | | Time |
| Self efficacy<br>Tolerance of negative<br>affect<br>Social support reduces<br>relapse | Supportive social<br>support networks<br>Relationship with<br>treatment<br>provider/therapist | Social support | |
| Spirituality Existential<br>issues | Voluntary help seeking | Spirituality | Work |
| There is a relapse<br>process | Co-morbidities<br>identified | | |
| | Previous episodes of<br>relapse | | |

**Treatment**

There is agreement in the literature, the Delphi consultation, the Focus Group Study and in the empirical, Observational Study that treatment and interventions are clearly helpful and reduce or prevent relapse.

**Social support**

Social support was identified in the Literature Review, acknowledged as very important in the Delphi Study and received empirical support in the Focus Group Study. However, it was one of the first variables eliminated in the modelling of the Observational Study data.

**Other empirical factors**

As time progressed in the empirical study there was an increased likelihood for the subjects to go into remission. Social integration in being at work was both a positive and negative risk factor, in that workers were more likely to be continuing gamblers; it was found to be

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protective in the Focus Group Study. Spirituality was also strongly supported empirically in the focus groups, by the Delphi participants and in the Literature Review.

In this project there has been a new observation made; the "zone", which suggests that there may be perpetuating factors operating to continually "push" the problem gambler to relapse, and once a relapse has occurred prevents her/him from interrupting the relapse process.

**Relapse cycle**

In the qualitative literature a continuing cycle of remission, lapses and relapses was described. Such a cycle was also established empirically in the Focus Group Study. This factor was not considered important by the Delphi participants nor specifically demonstrated in the Observational Study.

**The "zone"**

In the Focus Group Study problem gamblers described going into what appears to be an altered state of consciousness, which they called "the zone". Whilst in this state of mind the problem gamblers seemed to be unable to exercise normal cognitive abilities of self-observation, realistic appraisal of the value of money, seeing the consequences of their actions or exercising the will. This cognitive dysfunction appeared to inhibit problem gamblers to terminate their relapse until they ran out of financial resources, thereby perpetuating the duration of the relapse and exacerbating the losses and harm incurred. The "zone" has also been described in two other recent papers (Allcock et al., 2006, Livingstone et al., 2008).

Table 17. A comparative analysis of perpetuating factors in relapse.

| *Perpetuating factors for Relapse* | | | |
|---|---|---|---|
| **Literature review** | **Delphi Study** | **Focus group study** | **Observational study** |
| A cycle of repeated lapses and relapses | | Relapse process | |
| The "zone" Abstinence violation effect | | The "zone" | |

In summary, considerable agreement is depicted in the above tables. However, there is no real consensus even with the Delphi Study, where they have expanded the number of predictors and have described increasingly specific factors which could possibly be better grouped in a larger set of predictors; e.g. the many components of treatment individually categorised in the Delphi Study. The empirical contributions of this project also throw some light onto this discussion where clearly the roles of urge, gambling cognitions, impulsivity/sensation-seeking, negative affect, the "zone", co-morbidity and treatment need to be put to the Delphi participants again for further ranking to be carried out.

## Implications for models of relapse

There are no relapse models for problem gambling in the literature. Blaszczynski and Nower (2002) described three pathways by which people with varying predispositions come to develop problem gambling (Blaszczynski and Nower, 2002b). In 1977 the social learning model of substance use disorders was developed by the WHO working party chaired by Prof Griffith Edwards. This was a seminal point in the development of theoretical constructs that could be tested (Edwards et al., 1981). The Blaszczynski model and most other models in problem gambling and "other addictive behaviours" since that time share much in common

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with this model. All discussions in the literature about relapse revert to discussions about the model of Marlatt and Gordon (1985) for alcohol and "other addictive behaviours that was constructed as a linear process" (Marlatt and Gordon, 1985).

The validity of applying this model to problem gambling is clearly problematical, as there is no psychoactive external substance that is consumed, acting as a powerful operant factor in shaping behaviour when the arguments for substance use are advanced as applying to problem gambling. This becomes even more of a problem when drug dependence models and arguments are applied to problem gambling where abstinence syndromes come into play, because there is as yet no convincing evidence that an abstinence syndrome and reinstatement apply in problem gambling.

The most recent update in the literature is the dynamic model of relapse for alcohol, postulated by Witkiewitz and Marlatt (2004), and tested on the Project Match data set in 2007 (Witkiewitz and Marlatt, 2004). These authors now postulate that relapse is not in fact a linear process; rather, for alcohol, dependence relapse results because a large number of factors come together to make relapse more or less likely (Witkiewitz and Marlatt, 2007). It is suggested that on a background of high risk there are tonic processes which comprise an individual's underlying risk for relapse and phasic processes that "represent the dynamic precipitants to the transgressive behaviour" (p. 727). Their model is shown in Figure 3.

Figure 3. Dynamic model of relapse proposed by Witkiewitz and Marlatt (2004).
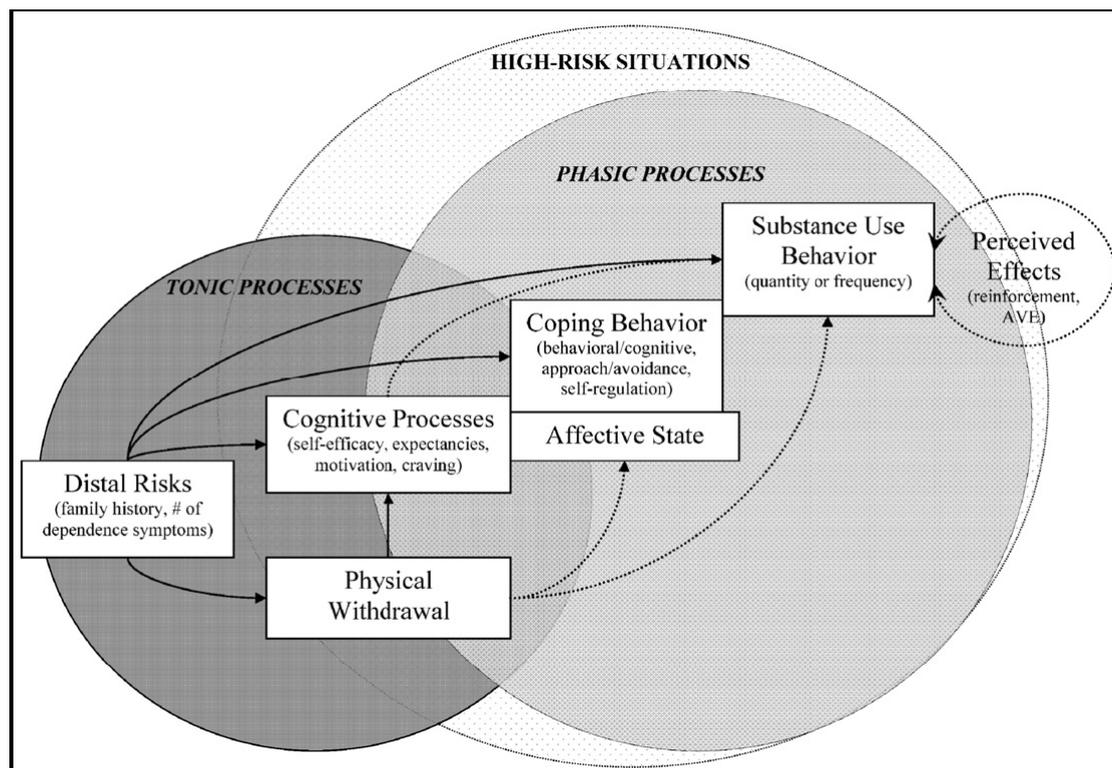


Many of the arguments advanced for alcohol dependence also apply for problem gambling. However, the physical aspects of dependence, withdrawal and reinstatement are powerful forces in the relapse of substance use disorders that can give rise to extremely discontinuous behaviours with severe relapse whenever any lapse that seems to be a minor precipitant occurs. This is a constant physical given in substance dependence.

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**The relapse project's empirical evidence about relapse in problem gambling**

The complementary findings of the Focus Group and Observational Studies lead us to suggest that gambling-related urges and cognitions are hard to separate, and both act to lead to relapse. The proposed dynamic model of relapse is shown in Figure 4.

*Part 1 of the relapse process- Cognitions and the urge are aroused*

Figure 4. Initiation of a sequence of mental events resulting in relapse – The "push" towards relapse.
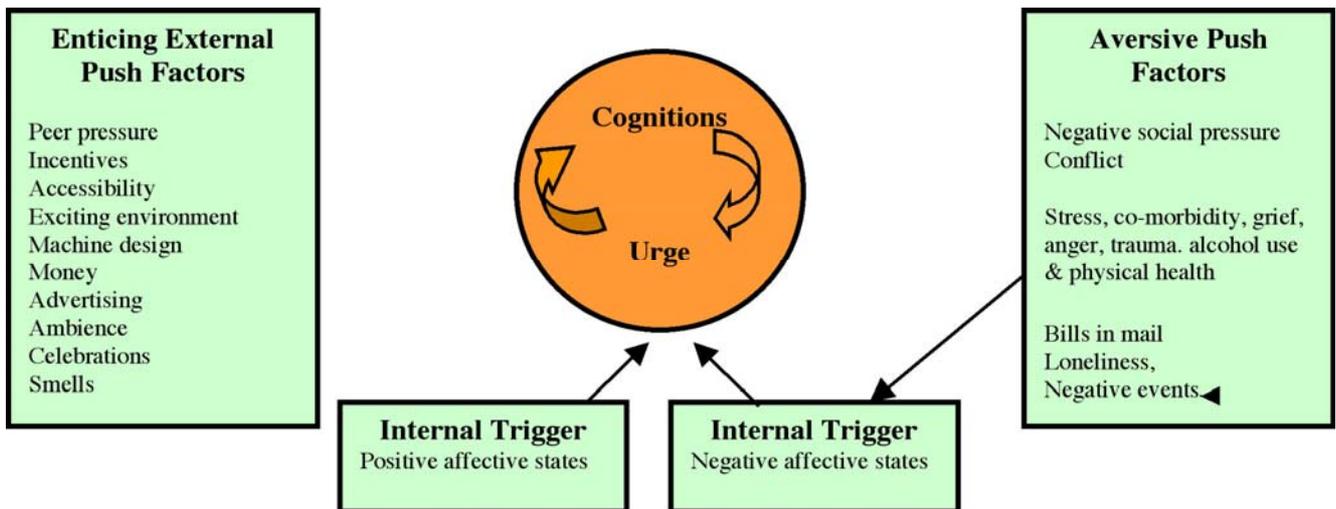


This proposed model of the initiation of relapse tells nothing about the innate predispositions or other "tonic processes" that lead to relapse in problem gambling. It simply describes what the focus group participants said. It does suggest that there are a number of both positive and negative chance events or "phasic processes" that can result in the initiation of the relapse process. Negative social pressure and conflict are described as important aversive "push" factors, and peer pressure or celebrations as enticing "push" factors. The fundamental difference is the suggestion that urge and cognitions appear to be the mediating mechanism around which the cognitive-behavioural relapse process occurs.

Figure 5 shows the relapse process when it ends in problem gambling behaviour. It describes the increasing arousal that occurs within the problem gambler that is relieved only when the decision to gamble (give in to the temptation) occurs and that a new cognitive state emerges where problem gamblers describe clear alterations in cognitions with inhibition of self-observation as the underlying impairment. It is clearly uncertain whether or not every problem gambler experiences being in "the zone", but if this is so relapse in problem gambling may involve a state-dependant alteration of cognition.

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Figure 5. The sequence of events that occurs in the process of relapse.
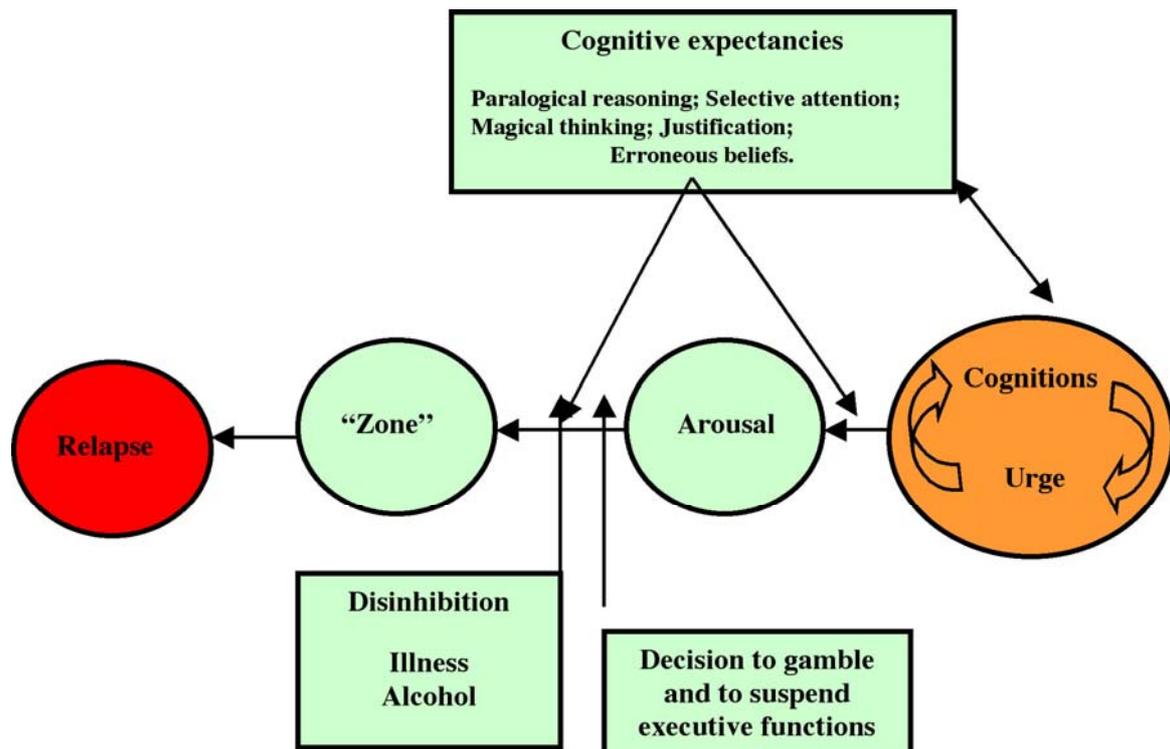


Three different patterns of relapse were described and Figure 5 shows final aspects of each pattern, i.e. the relapse behaviour. The first pattern was that of a linear relapse where urge and cognitions simply followed a pathway of increasing arousal with mutual reinforcement. The second was a pattern of classical approach – avoidance conflict where all the factors in Figure 6, the "pull" away from the relapse, came into play, but relapse still occurred. The third was a pattern that appeared to occur to the minority of focus group participants; that of a two stage relapse. i.e. deciding to relapse at a future time, where the urge and cognitions were stimulated as in Figure 4, but where the problem gambler short-circuited the relapse by deferring it to a future time. This is clearly a dynamic process that can be altered by chance happenings, as part of "phasic processes", e.g. an argument with a significant other pushing the relapse process in either direction, as suggested for relapse in alcohol dependence (Witkiewitz and Marlatt, 2004, Witkiewitz and Marlatt, 2007). A number of other considerations suggest that there may one or more conditioned cognitive – behavioural patterns that would comprise "tonic processes" such as low self-esteem and self-efficacy, abuse or a conflicted violent background or impulsivity.

Figure 4 shows two important differences from that by: the dynamic process of moral struggle occurring within the problem gambler and secondly the fact that a significant group of problem gamblers felt that they no longer had any problem having had urge reduction and response prevention treatment and thereby to exit from the model. It should be noted that a member of PA had also learned to extinguish the urge to gamble without formal CBT.

Figure 6. Managing problem gambling: the "pull" from relapse.
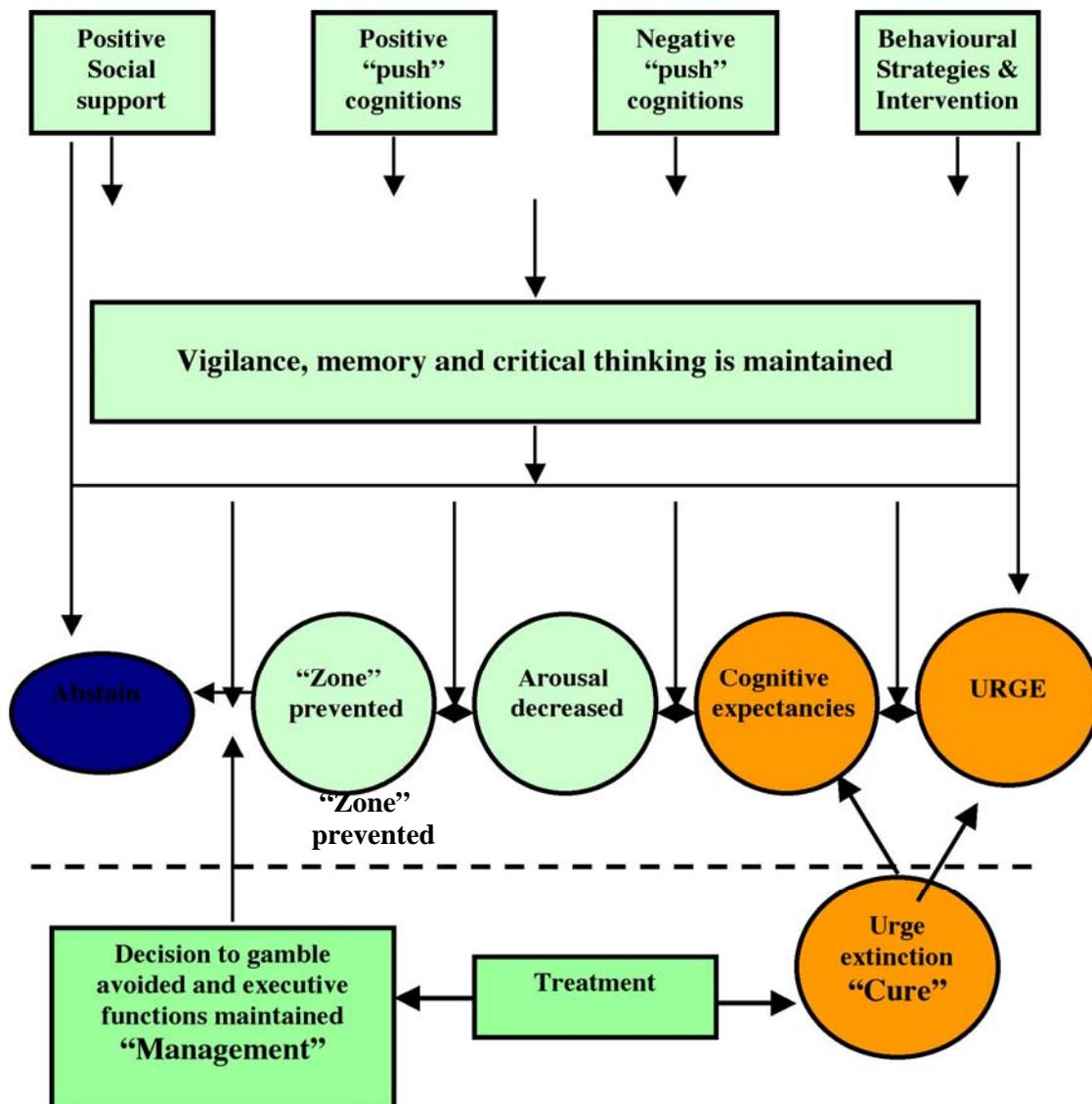


This indicates that urge extinction or "cure" becomes possible. The Witkiewitz and Marlatt model (2004 and 2007) makes no allowances for this, nor for the varying patterns of relapse. There is also no similar altered cognitive state described in the Focus Group Study within this model.

Nevertheless, it is a important model that needs to be examined against the dynamic model of relapse in problem gambling, which has been derived empirically in this project and which has been tested against the Observational Study where the most important elements and predictors of relapse in problem gambling have been confirmed: urge and cognitions, the management of which is possible and the extinction of which is desirable, leading to "cure". Clearly a much more detailed comparative study of this model and that of Witkiewitz and Marlatt (2004 and 2007) is warranted, but is beyond the scope of this project.

## Conclusions

A new model for relapse in problem gambling has been proposed based upon empirical observations. It needs to be examined critically and clearly needs further examination and replication. The pattern of relapse for Indigenous problem gamblers may also include community issues and grief.

## Recommendations

The following recommendations are made for clinical application and for future research:

*Clinical practice*

1. From the Focus Group Study and baseline measures of psychiatric morbidity in the Observational Study, it appears that problem gamblers experience substantial co-morbidity; as such a mental health assessment should form part of the intake assessment for clients of all gambling services and include the recognition and management of all co-morbidity especially depression.
2. In this study treatment of the urge to gamble appeared to be the most effective approach to terminating problem gambling and the avoidance of relapse. This remains to be definitively established.
3. With cognitive behaviour therapy offering the most promise for the elimination of urge and altered cognitions, consideration needs to be given to training in exposure and cognitive restructuring aspects of cognitive behaviour therapy for gambling counselling or therapy services.
4. Urge and cognitions should be measured at the commencement of treatment and at discharge as potential predictors of relapse. Clients should be educated about the need to eliminate urge and modify cognitions to prevent relapse.

*Research*

5. Treatment issues emerged as an important focus in this study. Those treated specifically with an urge reduction and response prevention strategy within a comprehensive cognitive behavioural approach clearly seemed to fare better when confronted with relapse situations.
6. This study strongly suggests that urge exposure and response prevention is effective in problem gambling treatment. A randomised controlled trial of this modality compared to a range of other treatments is warranted.
7. The findings of this study need to be tested with a number of other focus group populations, including:
   a) Clients receiving a variety of CBT strategies including cognitive therapy alone, which focuses upon different aspects of the relapse process
   b) Non treatment-seeking problem gamblers
   c) Aboriginal and CALD clients exploring the presence of cultural factors in the context of relapse
   d) Problem gamblers with co-morbid mental health disorders and personality traits such as impulsivity, sensation-seeking, disinhibition and susceptibility to reward.
8. The findings of this study need to be extended with a larger group to specifically examine the quantitative components of the proposed model, as a number of potential predictors of relapse failed to gain statistical significance.

Predictors for gambling relapse have been significantly altered by the findings from this project. As such it is recommended that:

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9. These data be put to the international Delphi Study group and that they be asked to further consider the hierarchy of predictors in gambling
10. There is a need to explore the relationship of the model proposed in this project against other aetiological and relapse models in problem gambling and other addictive behaviours, such as that developed by Witkiewitz and Marlatt (2004 and 2007).
11. An international consensus workshop on an agreed model of relapse in problem gambling be convened in association with the next "Think Tank" meeting of international experts in New Zealand in 2009.

The sequence of mental and behavioural events described in this study present many important questions that need to be answered if relapse in problem gambling is to be fully understood. A number of important studies need to explore aspects of this process in order to test its generalisability and to better describe its characteristics. The following are recommended:

12. Establishing the nature and frequency of the mental and behavioural sequences using a methodology such as an in-depth interview
13. The characteristics of the apparent altered cognition prior to and during relapse need to be described and evaluated
14. The capacity for problem gamblers to learn when they appear to move into and out of an altered cognitive set or altered state of consciousness has important implications for treatment and this needs to be examined as therapy of any sort may be ineffective; if this is so ways of interrupting this altered state of consciousness during relapse ("the zone") need to be explored..

*Machine Design*

Developing public health interventions to minimise the harm that occurs when problem gamblers are in an altered state of consciousness ("the zone") needs to be explored. This altered state of consciousness appears to have features consistent with the problem gambler being in a dissociative state, i.e. being seriously psychologically impaired at the time. The potential exists for EGMs to be programmed to recognise patterns of the use of these machines that are indicative of problem gambling and in those situations "pop up" messaging could assist problem gamblers to escape from this altered state of cognitive function as a harm reduction intervention. As such it is recommended that:

15. The existence and the nature of "the zone" be examined to establish if such a state of mind with diminished responsibility and cognitive malfunction is in fact involved in gambling relapse and in prolonging a relapse.
16. Ways of interrupting this altered state of consciousness during relapse ("the zone") need to be explored as a harm minimisation strategy that may be able to be automated by alteration in EGM programming.

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# SECTION 2: COMPONENT STUDIES

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# THE DEFINITION AND PREDICTORS OF RELAPSE IN PROBLEM GAMBLING

## LITERATURE REVIEW

**Commissioned by:**

Gambling Research Australia (GRA)

**April 2008**

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# LITERATURE REVIEW
## THE DEFINITION AND PREDICTORS OF RELAPSE IN PROBLEM GAMBLING

## Executive Summary

Gambling causes a range of harms to individuals who gamble and their families. Gambling treatment is effective, but research into its longer-term outcomes is limited, and the risk of relapse is currently not well known. A major impediment to improved research into the risk of gambling relapse is the lack of consensus about a conceptual and operational definition of relapse.

## Relapse definitions

Drawing on a richer literature in the addictions, relapse has been broadly conceptualised as either the re-emergence of a disorder or the revision of a behavioural commitment. There is little consistency in the operationalisation of relapse across the addictions, and although data is emerging on the natural course of addiction and recovery, relapse definitions tend to remain arbitrary, albeit based on clinical lore. There is increasing demand for multidimensional, contextual measures of relapse. The few studies that have directly examined gambling populations have defined relapse as the resumption of any gambling, an expedient but unsatisfactory conceptualisation. Consensus among researchers, consumers, policy-makers and the community is required on:

- the number and type of dimensions that will define both problem gambling and relapse
- the threshold of involvement or harm along the above dimensions that will define relapse
- the desirability of measuring relapse in the context of the individual's goals rather than as a standardised benchmark.

## Predictors of relapse

In spite of the difficulties in defining relapse, progress has been made in the addiction field toward understanding what influences fluctuations in the course of substance use. While there are relatively few studies of gambling relapse per se, there is a larger body of research on factors that influence the initiation and maintenance of gambling. Taken together these fields can inform future research into problem gambling relapse.

At present, the predictors of gambling relapse with strongest empirical support are:

- disinhibition and impaired decision-making
- gambling urges
- tolerance of negative affect
- cognitions related to erroneous beliefs about winning.

Factors worthy of further research due to reasonably strong empirical support of their involvement in gambling behaviour and relapse in other addictions include:

- self-efficacy
- impulsivity and related personality traits
- co-morbid psychiatric disorders (Antisocial Personality Disorders and Substance Use Disorders have the strongest support)
- gambling expectancies (especially expectancies of winning)
- gambling availability.

There is a need for much more direct research into relapse to gambling employing consistent, valid definitions of relapse, using true experimental or prospective methodologies and assessing the contribution of predictors in the context of other mediating and moderating variables.

This literature review will be combined with the results of the Delphi process in defining lapse and relapse in problem gambling, elements of relapse and potential predictors of relapse, to inform the design of a longitudinal observational study to determine predictors of relapse in problem gambling.

# 1. INTRODUCTION AND BACKGROUND

## 1.1 The definition of problem and pathological gambling

It is important at the outset to make clear some distinctions between terms commonly employed in gambling research and to state how these terms are to be interpreted in the present report.

Gambling is "a transaction between two parties in which an item of value (usually money) is transferred according to the outcome of a chance event" (Walker, 1992). Gambling is a behaviour that varies in frequency between individuals and which may or may not lead to harmful outcomes when performed by particular individuals. Gambling is to be seen as distinct from addiction or compulsion, and is not inherently irresponsible, antisocial or pathological. The majority of the Australian population engage in some form of gambling occasionally, for purposes of enjoyment and recreation, without causing themselves or others distress or impairment.

Pathological gambling is a clinical syndrome consisting of five or more of the following diagnostic criteria provided in Diagnostic and Statistical Manual (DSM-IV-TR) (American Psychiatric Association, 1994):

1. Preoccupation with gambling
2. Needing to gamble increasing amounts of money to achieve desired excitement
3. Repeated unsuccessful efforts to control, cut back or stop gambling
4. Restlessness or irritability when attempting to cut back or stop gambling
5. Gambling as a way to escape problems or relieve dysphoric mood
6. Gambling to recover losses from previous occasions of gambling ("chasing losses")
7. Lying to significant others to conceal the extent of involvement with gambling
8. Committing illegal acts to finance gambling
9. Losing or jeopardising a significant relationship, job, educational or career opportunity because of gambling
10. Relying on others to relieve a desperate financial situation caused by gambling (American Psychiatric Association, 2000).

The pathological gambling diagnosis encompasses a broad range of effects including changes in the functions served by gambling, impaired control over behaviour, and harmful social, occupational and legal consequences of increased involvement in gambling. The majority of clinical and large scale psychiatric epidemiological studies have employed this conventional term as it represents the best state of global consensus achieved on describing this population to date. However, concerns have been raised about its suitability for use in Australia. Delfabbro (2007) argues the term "pathological" implies that gambling is a disease with a clear aetiology and course distinct from non-problematic gambling and that there is little empirical support for this division. Instead, he prefers the term "problematic gambling" to denote the severe end of a continuum beginning with no gambling and occasional gambling (Delfabbro, 2007).

Problem gambling has been defined nationally as gambling "characterised by difficulties limiting money and/or time spent on gambling, which leads to adverse consequences for the gambler, others, or for the community" (Delfabbro and LeCouteur, 2005).

The existence of dual terminology requires researchers to exercise considerable care when analysing this literature. Pathological gambling is clearly a subset of problematic gambling. However, there will be individuals who do not meet full criteria for pathological gambling who nevertheless display a smaller number of these behaviours, or experience other harmful

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consequences of gambling, who qualify as problem gamblers. There may or may not be important differences between these two groups, and as such statements made about problem gamblers may or may not apply to pathological gamblers and vice versa. Indeed there is evidence that problematical gamblers may have an earlier age of onset, slower transition from gambling to problem gambling and make more rapid recovery to abstinence than pathological gamblers (Kessler et al., 2008).

In the present report, where studies have specifically defined their population using DSM-IV TR criteria for Pathological Gambling, the term "pathological gambling" will be retained when describing these studies. Where some other criteria are used for defining populations, including so-called "pathological gambling" ranges or cut-off scores on validated self-report scales such as the South Oaks Gambling Screen (SOGS), the more general term of "problem gambling" will be preferred.

## 1.2 Purpose of the literature review

Gambling contributes to a range of psychosocial harms (Delfabbro and Lacouter, 2006); (Productivity Commission, 1999). Existing treatment programs are capable of high success rates ((Echeburua and Fernandez-Montlalvo, 2000, Sylvain et al., 1997) and there is a high rate of spontaneous recovery among problem gamblers (Slutske, 2006). Nevertheless, gambling research is in its infancy and the long-term prognosis of pathological gamblers is largely unknown. Since gambling appears to share many of the psychological features of other addictions (Potenza, 2006) that are characterised by high relapse rates (Brandon et al., 2007) there is reason to expect significant relapse rates in pathological gambling. Should this be the case, minimising risk of relapse would constitute an important component of treatment and policy efforts to minimise gambling-related harm.

The objective of the literature review was "the conduct of a systematic review of the literature examining factors that predict relapse in problem gambling and other addictive behaviours, including alcohol and drugs of dependence" as specified in the project brief. Within the context of the overall project, the review has ended up being a modified systematic review compared to the restrictive use of randomised control trials as defined in the Cochrane guidelines for systematic reviews and meta-analyses (Higgins and Green, 2008). The purpose of the review was to primarily guide the study in each of its phases. The research team was required to provide the first Delphi workshop (three months after the commencement of the study) with a list of predictors of relapse as a starting point, so that an up to date, informed enquiry could be pursued to gain a practical consensus about the hierarchy of risk factors for relapse by experts in the field. Of necessity this "cast the net wide" in order to consider all factors associated or thought to be associated with relapse in problem gambling and other addictive behaviours. This is reflected in the wide ranging search strategy (see Appendix 1).

One of the biggest barriers to conducting more informative studies into the long-term welfare of problem gamblers is that to date, researchers have not reached consensus on what constitutes recovery from or relapse to problem gambling. This report reviews how relapse has been conceptualised and operationalised in the addictions, and then in gambling studies to date. Once a clear definition of relapse is established, research can focus on understanding its determinants. The report presents a framework for conceptualising the inter-relationships between predictive factors. The report concludes by observing which factors appear most likely to contribute to the risk of gambling relapse, and should thus be among the first to be investigated in subsequent research trials.

A similar conflict of purpose for the review also resulted from the need to conduct the focus group study, where the qualitative literature had to be examined (Higgins and Green, 2008). The literature in problem gambling relapse has a very long way to go before aggregation of

studies can be achieved. This literature review has therefore served the purpose of informing the project overall, and incorporates our interpretation and evaluation of the data available on relapse factors in problem gambling, alcohol and other drug problems and addictive behaviours. For the first time it attempts to incorporate both quantitative and qualitative insights in this area.

This literature review was conducted in two concurrent phases using web based search engines and through personal communication with professional networks, specialist librarians and research colleagues (see Appendix 1 for details of the search strategy).

A limited number of studies were found to be pertinent to relapse in problem gambling. Therefore this review focused on studies, and included studies, of factors that maintained or increased the risk of gambling. For example there is considerable literature existing in the addictions field documenting factors that predict relapse following substance abuse treatment. There is also substantial literature on factors that lead to the initiation and maintenance of pathological gambling. Both these bodies of work can inform initial investigations into the determinants of gambling relapse.


## 1.3 Prevalence of gambling, pathological gambling and problem gambling

### 1.3.1 Prevalence of gambling

Delfabro and Lacouter (2006) reviewed surveys of gambling participation in Australia and New Zealand and reported that 80-90% of the adult population gambles at least once per year on at least one form of gambling, with approximately 40% of the population gambling at least weekly. The popularity of different gambling activities varies considerably. Approximately 60% of the population gamble on lotteries (e.g., Cross Lotto, Powerball) at least once a year (25% at least weekly), 35% use scratch tickets or electronic gaming machines (4-7% at least weekly), 20-25% participate in race betting (4% at least weekly), 15-20% play Keno (less than 2% play at least weekly) with less than 10% engaging in all other forms of gambling (approximately 1% at least weekly).

### 1.3.2 Prevalence of pathological gambling

No nationally representative surveys of the prevalence of pathological gambling in the general community have been conducted so far in Australia. In the United States, several such studies have been carried out. The National Epidemiological Survey on Alcohol and Related Conditions (NSEARC) is the largest, most representative psychiatric epidemiological study, having surveyed 43,093 adults in the United States over the years 2001 and 2002. The National Co-morbidity Survey Replication (NCS-R) study sampled 9,282 adults in the US between 2001 and 2003. The overall lifetime prevalence rates found for pathological gambling were similar in both studies and extremely small compared to other psychiatric disorders, at 0.42% in the NSEARC study (Petry et al., 2005) and 0.6% in the NCS-R (Kessler et al., 2008)

### 1.3.3 Prevalence of problem gambling

As expected, problem gambling encompasses a larger population than would meet criteria for pathological gambling, but still constitutes a very small proportion of those who gamble. In Australia, the prevalence of problem gambling is estimated to vary between less than 1% and 2.5% across states (Delfabbro and Lacouter, 2006). Defining problem gambling as at least one symptom (but not all five) of pathological gambling, Kessler and colleagues (Kessler et al., 2008) reported a lifetime prevalence of 2.3% in the US.

There are 5 primary measures available in Australia to assess problem or pathological gambling:

1. The DSM-IV criteria
2. The South Oaks Gambling Screen (SOGS)
3. The Victorian Gambling Screen (VGS)
4. The Eight Screen (8–screen)
5. The Canadian Problem Gambling Index (CPGI).

The SOGS is the most widely used measure; the VGS is the only one developed for use in Australia. The CPGI has now been adopted as the principal measure for all prevalence research in Australia (Delfabbro, 2007). It is important to point out that although the SOGS is the most widely used measure, the SOGS is an unsatisfactory instrument to measure the prevalence of problem gambling in the general population. It was recommended that the SOGS be replaced as the screen of choice in future Victorian and Australian population surveys (Wenzel et al., 2004).


## 1.4     Prevalence and cost of gambling related harms

### 1.4.1     Money lost
Financial problems constitute the most common and obvious category of gambling-related harms. The Australian Productivity Commission (1999) reported that 70% of problem gamblers said they had spent more than they could afford in the previous year, 19% reported having borrowed money and not paid it back, and 11% reported having sold property to gamble. On average, problem gamblers in Australia are estimated to lose approximately AUS$12,000 per year compared to AUS$650 for non-problematic gamblers. Although problem gamblers constitute only 2% of the adult population, they are estimated to be responsible for 42% of national expenditure on gambling.


### 1.4.2     Criminal activity
The Productivity Commission (1999) found that 27% of problem gamblers in Australia reported having committed illegal acts relating to gambling, with 13% reporting trouble with the police and having to attend court. Community surveys have not specified the types of criminal activity most commonly undertaken, but in a treatment population study, the most common offences were theft (31%), embezzlement (22%) and misappropriation of funds (7%) (Blaszczynski and McConaghy, 1994). The crimes of those in treatment tend to be "white-collar", and those individuals tend to have had no previous criminal activity prior to gambling. This represents a different population to prison samples, which evidence a high rate of problem gambling (31%), but whose criminal involvement is not usually gambling-related (Delfabbro and Lacouter, 2006).

### 1.4.3 Family and relationship problems
The Productivity Commission (1999) reported that a lack of trust, lying, arguments and financial stress caused by gambling led to significant pressures on families. It was estimated that gambling related problems were likely to cause 1600 divorces per year in Australia. In addition one in ten gamblers in counselling reported violent gambling related incidents (Productivity Commission, 1999).

### 1.4.4     Occupational problems
Approximately 70% problem gamblers are in either part- or full-time employment. Around 25% of problem gamblers report that gambling adversely affects their work, and 19% reported having lost time from work or study in the previous 12 months. However, only 0.5% reported losing their jobs (Productivity Commission, 1999). Other affects of gambling on work include lost confidence, lost concentration and impaired work quality.

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# 2. THE DEFINITION OF RELAPSE TO PROBLEM GAMBLING

The difficulty of defining relapse has plagued the investigation of treatment efficacy in every psychiatric and substance use disorder (Bradizza et al., 2006, McKay et al., 2006). Chung and Maisto (2006) distinguished between conceptual and operational definitions of relapse, arguing there was general consensus on the conceptualisation of relapse, but variation in its operationalisation. On the other hand, others have clearly disputed its conceptual utility (Miller et al., 1996, Saunders and Allsop, 1989). Given the greater exploration of relapse in the field of addiction, this section reviews the conceptual and operational differences in definitions of relapse outside the gambling field initially, before presenting how the gambling field has begun to address relapse.

## 2.1 Conceptual issues in defining relapse

### 2.1.1 Process or outcome: Conceptualising problematic behaviour

How relapse is conceptualised depends on one's broader conceptualisation of addiction or mental health and cannot be separated from it (Saunders and Allsop, 1989). Traditionally there have been two dominant perspectives: the 'disease' model and the 'social learning' model.

Characteristics of the disease model include: viewing problematic behaviour as a symptom of an underlying syndrome or pathophysiological process; an aetiology and course over which the individual sufferer does not have complete control; this affects some individuals and not others. Cessation of problematic behaviour is seen to result either from successful treatment or "spontaneous recovery".

From this perspective, a single instance of the problematic behaviour following a period of cessation can be seen as signalling the re-emergence of the disease process. Prior to the 1980s this was primarily how relapse was conceptualised (Marlatt and George, 1984) and measured (Hunt et al., 1971), and many studies continue to adopt this definition. However, the refinement of psychiatric diagnostic systems has led to relapse being considered along a broader range of dimensions. The modern disease model-oriented concept of relapse could be generally defined as the resumption of symptoms or problematic behaviour after a period of their absence or improvement.

The social learning model tends to view addictive behaviour as predominantly volitional, governed by the same processes that govern any behaviour. Its trajectory is seen to be influenced by the balance of its positive and negative consequences, and the skills and expectations of the individual. When the individual decides the negative consequences outweigh the positive, he/she pursues a new behavioural course (e.g., abstinence or reduced involvement).

Marlatt and Gordon (1985), pioneers of the social learning perspective, argued that relapse was best seen not as a single event (i.e., first occasion of use after abstinence), but a process of disruption to, and revision of commitment to, the new behavioural course. They distinguished between a "lapse" (a single instance of the problematic behaviour) and a full relapse (return to the former pattern of problematic behaviour). Social learning theories then gave prominence to contextual factors surrounding lapses and the psychological reactions that either led to a full relapse or renewed commitment to the previous behavioural course. Generally, social learning theorists conceptualise relapse as a complex and dynamic process, not reducible to a single outcome.

Characteristic of the social learning perspective is a more positive regard for relapse (Marlatt and George, 1984). It was included as one of the universal stages of behavioural change in one of the early versions of (Prochaska and DiClemente, 1983) transtheoretical model. There,

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relapse was seen as an inevitable part of maintaining long-term behaviour change. It has been argued that relapse can be seen as an opportunity to strengthen resolve, an audacious reframe of the traditional concept of "backsliding" (Miller et al., 1996). The term "prolapse" has been coined to refer to "getting back on track" after a lapse. Witkiewitz and Marlatt (2007) have highlighted that responses to relapse in alcohol dependence tend to be bimodal: either a resumption of heavy drinking or a return to abstinence. Thus, there may be value in relapse, depending on how one responds.

### 2.1.2    Demarcating relapse from the previous problematic episode

Regardless of whether one adopts a disease or social learning model, for the concept of relapse to have any heuristic value it needs to be distinguished from the original problematic episode either quantitatively or qualitatively. From a disease model framework, this means specifying criteria for remission, a minimum standard of improvement from the symptoms of the problematic episode.

Both remission and relapse should be assessed along a similar number of dimensions to that which defines the disorder or disease. For example, alcohol dependence is not defined only by drinking. Symptoms such as tolerance, withdrawal, preoccupation, impaired control, and neglect of other activities or responsibilities contribute to the syndrome. Failure to include the status of these other symptoms raises the question of whether any abstinence from alcohol constitutes a complete recovery from the end of alcohol dependence.

The demarcation of episodes has important implications for how the effectiveness of treatment is appraised and what additions or amendments are required. The regular finding of abstinence by end of treatment followed by early resumption of problematic behaviour after treatment has typically been reported as though treatment is effective, but the benefits are short-lived. The recommendation is then to focus on "relapse prevention" to sustain the effective treatment benefits beyond contact with the service provider. However, an alternative view might be that abstinence is only an initial stage in recovery and is not a sufficient treatment outcome. The high rate of subsequent use early after leaving treatment might then be seen as resulting from incomplete treatment.

An equivalent level of conceptual clarity is required of a social learning "process" account of relapse. The psychological processes in operation, or the states they give rise to must be specified for periods of temporarily resumed problematic behaviour (e.g., lapses to drug use) that follow periods of its absence or marked reduction (e.g., abstinence) that distinguish it from other periods of the problematic behaviour (e.g., regular drug use). There have in fact been several efforts to do this. One of the fundamental contributions of the stages of change model was to recognise that the same ostensible level of problematic behaviour might have quite a different quality for individuals who differ in readiness to change. Thus, for example, someone who is abstaining from gambling thinking less about it, experiencing few urges to gamble and engaged in a range of non-gambling activities might be considered in a "maintenance" stage. On the other hand, someone who has not gambled for some time, but has begun to have urges to gamble again, constantly weighs up the costs and benefits of gambling and is doubting his/her ability to resist gambling could be said to be at the beginning of the relapse process. Care should be taken to avoid conceptual ambiguity that might arise through failure to discriminate factors that constitute the relapse process from factors that are not part of the process, but influence its onset or course (i.e., predictors of relapse).

### 2.1.3                         Whose treatment goal?

The definition of relapse with respect to some problematic behaviour raises the question of who defines the problematic behaviour. Obviously, there is a range of conventions for experimenter-defined problem statements, but these are not necessarily representative of the

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participants' views. As (Maisto et al., 2003) points out, adolescent treatment outcome studies have included among those labelled as relapsed those who had no intention of remaining abstinent post-treatment. If an individual is striving for abstinence, any occasion of problematic behaviour may be an appropriate index of relapse. If the individual has a harm-reduction goal, a measure of negative consequences is more appropriate (Witkiewitz and Marlatt, 2007). Failure to take into account goal intentions threatens the validity of any definition of relapse.

### 2.1.4    Type of problem and relapse rates

Relapse has been seen as both a process operating similarly across problematic behaviour, and displaying characteristic differences depending on the problem (Brownell et al., 1986). For example, alcohol relapse rates appear to diverge far more with different operationalisations (Miller et al., 1996) than do smoking relapse rates (Piasecki, 2006).

## 2.2 Operationalising relapse

The purpose of this section is to review the different ways relapse has been operationalised and any available evidence on their relative advantages and disadvantages. A distinction is made between (the majority of) studies that have adopted definitions by convention and those that have attempted to determine naturalistic courses empirically.

### 2.2.1    Conventions for relapse and recovery

As argued in section 2.1.2, for the concept of relapse to be useful there must be clear separation between episodes of problematic behaviour. To highlight how this has been carried out to date, the review is organised around three segments of the problematic behaviour trajectory:

1) the definition of the end of the first episode. It need not be complete recovery, but the level of remission or improvement ought to be specified

2) the period of episode separation should be specified both in duration and quality (e.g., what number of lapses or level of symptomatology is permitted)

3) the definition of the beginning of the relapse period. This includes the number of dimensions that would be considered, and their frequency, density or intensity.

#### 2.2.1.1        *Operational definitions of the end of the first episode*

The end of the first episode of problematic behaviour is usually defined by the cessation of the behaviour. However, it need not be. The state of functioning at entry into, exit from, or completion of a treatment program could constitute an idiographic baseline against which a subsequent period of "improvement" (episode separating period) could be compared. Alternatively, a predetermined level of symptomatic improvement or recovery is a viable alternative commonly employed in mental health, but rarely in addictions (Brandon et al., 2007).

The Diagnostic and Statistical Manual 4th Edition (DSM-IV, APA, 1994) provides operational definitions of remission for most mental health disorders, frequently differentiating full (meeting no criteria for the target psychiatric disorder) or partial remission (meeting at least one but not all criteria). When investigating relapse to alcohol dependence, studies employing recently recruited samples have usually employed DSM-IV remission

criteria (e.g., (Bischof et al., 2001, Dawson et al., 2007), where reports on long-term follow-up used their own criteria (e.g., Mann et al., 2005, Moos and Moos, 2006).

Depression research has employed finer distinctions than possible with the DSM; the so-called "5 Rs": treatment response, remission, relapse, recovery and reoccurrence (Riso et al., 1997). Treatment response represents a reliable improvement during the treatment phase that can differentiate those who improve and those who do not, without full criteria for remission needing to be met. Remission here represents a greater magnitude of improvement beyond responding to treatment. Both response and remission have been operationalised using cut-off scores on standardised self-report or clinician-rated scales.

### 2.2.1.2 Operational definitions of intervening period

There have been various operational definitions of the period required to establish separate episodes of problematic behaviour (Chung and Maisto, 2006). Abstinence, the complete absence of the problematic behaviour is the most common in the addiction field (Miller et al., 1996). In these cases, the variability concerns the duration of the period of complete abstinence required. Conventions have included four days for alcohol (Maisto et al., 2003) 24 hours (Velicer et al., 1990) to 7 days for smoking (Piasecki et al., 2002), and 2 weeks for cocaine (McKay et al., 1996) and cannabis (Moore and Budney, 2003). The criteria are arbitrary but represent clinical judgements that seem appropriate to the particular problematic behaviour. For example, cocaine is typically used in binges separated by brief periods of abstinence, so a period of at least one month of abstinence has been recommended to separate episodes of use (Havassy et al., 1993). The choice of 2 weeks for cannabis has clinical significance because it is longer than most cannabis dependent users typically experience, but still achievable by approximately half of treatment samples (Moore and Budney, 2003). Should total abstinence define the separation of episodes, the duration needs to represent a departure from the typical intervals between occasions of the behaviour during the first episode.

In light of Marlatt's lapse-relapse distinction, some authors have allowed for one or more instances of the problematic behaviour ("slips") within the separation period before the relapse episode. As Miller (1996) points out, the choice of any "threshold" of frequency before a series of lapses is called a "relapse" is arbitrary. However, provided the density of occasions of the problematic behaviour (instances in a given time period) during the separation period are markedly different from typical densities in the first episode, working operational definitions may be clinically meaningful. Thus, lapse has been defined as any smoking and relapse as 5 or more cigarettes on 3 consecutive days, a threshold for return to regular use (Gwaltney et al., 2005). Similarly, heroin relapse has been defined as use on more than one third of days since treatment, and a lapse as any amount used less than this threshold (Gossop et al., 2002). Because around a quarter of people who eventually attain continuous abstinence from smoking report having a few cigarettes early on in their quit attempt, some studies have employed a grace period. The grace period immediately follows treatment completion or planned quit dates, during which continued smoking does not count as a failure (Hughes et al., 2003).

Studies that use diagnostic criteria to define problematic episodes and remission periods adopt a multi-variate assessment of the separation period. Several alcohol studies have also used multivariate definitions of separation periods without using DSM criteria. For example, Moos and Moos (2006) defined remission as either abstinence or moderate drinking during the last 6 months with no alcohol-related problems, no intoxication or consumption of more than 3 ounces on drinking days in past month. Those who failed to meet these criteria were considered relapsed.

*2.2.1.3    Operational definitions of resumption*

Uni-dimensional definitions: problematic behaviour frequency

Alcohol relapse studies have often employed univariate operational definitions of relapse, usually a measure of drinking, but the precise measure has varied considerably. When following samples who have entered formal treatment, relapse is often defined as a return to pre-treatment drinking levels, or in some centres, 50% of pre-treatment levels (Miller et al., 1996). Some authors have used a "heavy drinking day" after a period of abstinence to define relapse (Miller et al., 1996). A heavy drinking day has been variously defined as 5 standard drinks for males and 4 for females (Allen et al., 1996, Maisto et al., 2003), 5 for males and 3 for females (Greenfield et al., 2000), and 10 for men and 5 for women (Saunders et al., 1993). Other studies have employed a cumulative amount to define relapse, for example 10 ounces or more over 6 months (Glenn and Parsons, 1991) or 21 drinks for men or 14 drinks for women over 21 days (Foster et al., 2000). Project MATCH, the largest alcohol treatment outcome study so far, defined relapse as three consecutive "heavy" drinking days (6 standard drinks for men, 4 for women) (Project MATCH Research Group, 1997).

The range of operational definitions of relapse in alcohol studies can be attributed to the variety of common drinking patterns, each with different associated risks (Thorley, 1985). Relapse to heroin use, which when problematic tends to be used daily, has been defined by long-term regular use patterns: either resumption of daily use (Gossop et al., 1989), or use on more than one third of days since treatment (Gossop et al., 2002). Since psycho-stimulants such as cocaine and methamphetamine are typically not used daily, it has been recommended that resumption criteria not be daily use (Havassy et al., 1993). One of the few operational definitions of relapse besides "any use" that has been employed across substances has been 4 days of use in any 7-day period. This has been employed in studies of alcohol, nicotine, opiate and cannabis use (Hall et al., 1990, Moore and Budney, 2003), as these drugs are typically used nearly daily when problematic.

Multi-dimensional definitions of relapse

Formal diagnostic criteria for substance dependence represent a convenient convention for a multidimensional definition of relapse. These have been employed in studies of alcohol (Dawson et al., 2007) and cocaine (Weiss et al., 1997). However, as Miller (1996) has highlighted, the dependence syndrome is itself only a limited subset of the phenomena surrounding problematic behaviour. He suggested a number of other dimensions that could be included in relapse definitions: 1) Adverse consequences such as legal, financial, relationship and occupational problems, or in the case of many drugs, accidents and injuries secondary to intoxication; 2) Physiological functioning, for example, liver function tests for alcohol problems; 3) Cognitive impairment, as measured by neuropsychological performance; 4) Involvement in other problematic behaviours, for example, use of other drugs or involvement in gambling. With respect to alcohol, these dimensions are only moderately correlated, so not adequately captured by a uni-dimensional measure. Some authors have defined relapse both by a measure of the problematic behaviour and of its adverse consequences (Maisto et al., 2003), but true multidimensional assessment of relapse is rare.

## 2.2.2    Attempts to empirically define relapse

There have been attempts to see whether there might be naturally occurring time-points that might act as "critical" or "safe periods", before which the likelihood of relapse is relatively high and beyond which it is relatively low. Such studies typically use survival curves and examine the proportion that remains abstinent (or other criteria below threshold for relapse) over time. Care must be taken with measurements used to construct these curves, and in their interpretation, as group averages can give misleading impressions of individuals' courses (Brownell et al., 1986). Nevertheless, several investigations suggest there may be periods at

which clinically meaningful changes in course occur, offering a more valid basis for separating episodes of problematic behaviour than arbitrary criteria.

The earliest indication of this possibility was Sutton's (1979) reanalysis of Hunt et al.'s (1971) data. Hunt and colleagues reported that 65% of those who smoked cigarettes, drank alcohol and used heroin used their drug of choice again within 3 months following treatment. Sutton (1979) demonstrated that 71% of those who remained abstinent 3 months after treatment also remained abstinent during the following 3 months. There is a relationship between the length of abstinence sustained and the probability of continuing abstinence.

Stout(2000) performed detailed analyses on the probability of future periods of sustained abstinence after various earlier lengths of periods of abstinence from drinking. Stout's sample differed from Hunt and colleagues', as all had consumed at least 1 standard drink post-treatment. There was no duration of abstinence from which people did not drink again. Even after 2 months of abstinence, half returned to heavy drinking within 3-7 months. Nevertheless, achieving 7 days, 14 days and 4 weeks of continuous abstinence was predictive of increased latencies to the next drinking occasion. The authors recommended 14 days abstinence as a criterion for separating drinking episodes, as latencies to drink increased by less at this point (i.e., survival curves "flattened out"), and because drinking may be tied to fortnightly pay cycles, it was a clinically meaningful milestone.

In a review of studies of smokers' attempts to quit without treatment, the majority of smokers relapsed within 8 days of ceasing (Hughes et al., 2004). The shape of long-term abstinence curves for smoking is typically "L-shaped", with a sharp reduction in abstinence rates during about the first 80 days after quitting, and little change in abstinence rates over the next 2 years (Medioni et al., 2005). These curves are relatively invariant across treatment studies (Piasecki et al., 2002).

### 2.2.3    Measurement issues

Relapse rates for populations have often been reported using point prevalence rates; the proportion of people who have engaged in "any" amount of the problematic behaviour in a given recent period, such as the last week (Kenford et al., 2002). This has been criticised on two counts. On one hand, it may be too conservative, as it counts one isolated lapse as a relapse, and may underestimate recovery rates. Alternatively, it may be too liberal, as people who have engaged in the problematic behaviour frequently prior to the reference period and who give up just before the survey get counted as abstainers (Piasecki, 2006). Hence, in smoking at least, the use of continuous and prolonged abstinence rates has been recommended in reporting treatment outcomes (Hughes et al., 2004). The disadvantage with this method is that continuous abstinence is fairly rare, even during brief time periods, so many people who make significant reductions in their problematic behaviour over a 12 month period may experience several reoccurrences which disrupt their attainment of "continuous" abstinence (Miller et al., 1996).

A second issue Miller (1996) has raised is whether self-report from the individual engaging in the problematic behaviour is sufficient to measure relapse. Various biochemical tests can be employed to verify self-reported drug use, and reports from friends or families can be used to corroborate self-report for most behaviours.

### 2.2.4    How definitions impact relapse rate estimates

Definitions make an enormous difference to estimates of relapse prevalence rates. In alcohol dependence, rates as high as 90% might be found if relapse is defined as a single drink following treatment (Edwards et al., 1977) or around 50% if defined as a return to pre-treatment drinking levels (Armor et al., 1978).

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Some studies have compared alternative definitions of relapse directly. Hodgins et al. (1999) compared the impact of the following definitions of drinking relapse on the ability of depressed episodes to predict time to relapse: 1) week of first drink; 2) week of first alcohol or other drug use; 3) week of first "heavy" drinking day (6 or more standard drinks); 4) week of first heavy drinking or drug use day. Having a depressed episode was a stronger predictor of relapse in the same week when using relapse definitions that included other drug use.

## 2.3    Definitions of relapse employed in gambling studies

A review by Ledgerwood and Petry (2006) found only 6 studies that had directly studied relapse in gambling (two of which were prospective in design), and we could only locate two other studies of relapse in gamblers (Daughters et al., 2005, Goudriaan et al., 2008). Table 1 lists studies that have included operational definitions of relapse in gambling. Each study focused on participants meeting criteria for pathological gambling except Hodgins and El-Guebaly (2004), which recruited for the broader definition of problem gambling, but nevertheless found 89% met criteria for pathological gambling.

There was little variation in the number of dimensions considered in defining relapse, most considering only gambling frequency. Both Hodgins and El-Guebaly (2004) and Blaszczynski et al. (1991) allowed participants to contribute to definitions of relapse: in the former study, participants nominated whether they were abstaining from all forms of gambling or only certain forms that had caused them problems; in the latter, participants defined what constituted "excessive" gambling quantity. The most obvious lack of consensus concerns the period of abstinence required to separate episodes of gambling, the "reset" period. Most studies did not provide sufficient information to determine whether such a period was defined. The two studies that specified a period differed in their specification (2 weeks and 1 month). Some authors attempted to define relapse thresholds beyond a single instance of gambling, each in different ways.

Little attention has been paid to defining relapse in gambling studies. Most have simply adopted the expedient position of defining relapse as a single instance of gambling following a period of abstinence. Inadequacies of this index are outlined in sections 2.1.2 and 2.2.3. As emphasised in section 1.2, gambling should be distinguished from problem gambling. Existing relapse operationalisations have not done this. Hodgins and El-Guebaly (2004) reported only 8% of those who decided to quit abstained from any gambling for 12 months, mirroring the pessimistic findings in addictions research. However, only about half were associated with a serious financial consequence for the individual. Studies have recruited those meeting criteria for pathological gambling but, with the exception of Blaszczynski et al. (1991), have failed to include any aspects of this syndrome in definitions of relapse. Clearly, without greater consensus in the specification of relapse, widely divergent reports can be made about the course of problem gambling.

Table 1. Definitions of relapse employed in studies of gambling.

| Study | Problem definition | Max. follow-up period | Relapse dimensions | Who defined | "Reset" period | Relapse threshold |
|---|---|---|---|---|---|---|
| Blaszczynski et al. (1991) | Pathological gambling (DSM-III) | M = 67.1 (24.69) months Range = 2-9 years | 2: gambling quantity; loss of control | Subjects (idiographic) | 1 month abstinence | Subject-defined "excessive gambling" + loss of control |
| Daughters et al. (2005) | Pathological gambling (SOGS > 5) | Not specified | 1: gambling frequency | Authors | Abstinence. period not specified | One occasion of gambling |
| Echeburua et al. (2000) | Pathological gambling (DSM-IV) | 12 months | 2: gambling frequency and quantity | Authors | Abstinence. period not specified | > 2 episodes or episode > average weekly quantity spent pre-treatment |
| Hodgins & El-Guebaly (2004) | "Gambling problem but recently stopped gambling" (SOGS > 4) | 12 months | 1: gambling frequency | Subjects defined whether goal to abstain from all gambling or only problematic types | 2 weeks abstinence | One occasion gambling: any type/ problematic type depending on subject goal. |
| Johnson et al. (1992) | "Compulsive gambling" (All met DSM-IIIR criteria Pathological gambling) | Retrospective. Not specified | Not specified: "compulsive gambling"; presumably at least, gambling frequency. | Authors | Abstinence. not specified. | > 50% of gambling prior to joining Gamblers Anonymous |
| McCormick & Taber (1991) | Pathological gambling (DSM-III) | 12 months | 1: gambling frequency (violation of abstinence) | Authors | Abstinence. period not specified | One occasion of gambling |
| Zion et al. (1991) | Gambling (GA members) self-administered questionnaire. | Retrospective: period 7 months – 24 years | 1: gambling frequency | Authors | Abstinence. period not specified | One occasion of gambling |
| Goudriaan (2008) | Pathological Gambling (DSM-1V) | (N=24) 12 month period | Persons who answered 'Yes' to the question, 'Do you think that you have a gambling problem again?' | Authors | 1 year after baseline measures taken | Clients' assessment of gambling problem |

The definitions of problem gambling used in these gambling studies reflect the issues in measurement for problem gambling (Delfabbro, 2007). Pathological gambling was defined using the DSM III criteria by Blaszczynski (1991), Johnson et al. (1992) (DSM 111R), Echeburua et al. (2000) (DSM-1V) and McCormick & Taber (DSM 111). Daughters et al. (2005) used the SOGS > 5 and Hodgins & el-Guebaly (2004) the SOGS >5. Zion et al. used a self-administered questionnaire. The self-administered questionnaire consisted of 24 closed-ended questions and concluded with two open-ended questions. Questions assessed participant demographics and the relationship between membership in Gam-Anon and rate of relapse. Two questions examined whether the gambler or spouse had counselling, and if so what type, while in GA or Gam-Anon. Other questions assessed coexisting self-identified addictive-like behaviours in the spouse and gambler, rate of recidivism, and the gambler's view on the strengths and weaknesses of the GA model (Zion et al., 1991).

A separate, larger body of studies has measured gambling treatment more comprehensively and many of these have 12-month follow-ups (Dowling et al., 2007, Toneatto and Ladouceur, 2003), but these are of limited import to studying relapse because treatment completer samples have such heterogeneous outcomes. Without agreed upon definitions of recovery, relapse and separation of episodes, it is unclear when treatment completers "recovered" and what proportion of these relapsed. Group means at post-test and follow-up mask whether individuals remained at the same level of the outcome variable at each assessment point or moved in and out of problematic ranges, as is common in relapse studies (Miller et al., 1996).

## 2.4 Requisite features of a definition of relapse for problem gambling

As the review in section 2.2 highlighted, a range of factors can potentially impact the conceptualisation and operationalism of definitions of relapse. While further research may eventually produce empirically based parameters for critical periods in which the frequency of problematic behaviour reliably changes, this data is not currently available for gambling. There still remain pre-analytical decisions to be made about the breadth and quality of problem gambling relapse phenomena of interest in future investigations:

1. Which dimensions will define relapse: is gambling frequency sufficient to capture the nature of problem gambling?
2. What threshold of gambling or other symptomatology/harm should define relapse?
3. How important is it to define relapse with respect to the gambler's goals (compared to those of researchers, policy makers, or the general community)?

# 3   . THE DEFINITION AND PREDICTORS OF RELAPSE TO PROBLEM GAMBLING

Until recently, most theories of relapse have been relatively simple, concentrating on one or two key predictors. Recently, authors have begun to propose more complex, integrated and dynamic models of relapse. These offer a more comprehensive picture of the factors involved in relapse; however, much more research is needed to specify the relative impact of many of these variables, and to support hypotheses about causal and mediating relations between variables. Indeed, the statistical methods needed to legitimately assess the accuracy of these models are only just being disseminated. Nevertheless, there is sufficient preliminary evidence to warrant working hypotheses about the likely relative significance of this large collection of risk factors. Whilst the primary focus of this study is gambling relapse, there were only a few studies specific to the relapse process; therefore studies that identified factors that maintained or increased the risk of gambling such as treatment outcome studies were also examined.

## 3.1 Factors that may increase risk of gambling relapse

### 3.1.1    Personality traits

Personality traits are "enduring patterns of perceiving, relating to, and thinking about the environment and oneself … exhibited in a wide range of important social and personal contexts" (American Psychiatric Association, 1994 p.770). A large body of evidence demonstrates an association between certain personality characteristics and increased susceptibility to developing a range of psychopathology, including problem gambling (Cunningham-Williams et al., 2005), substance dependence (Bravo de Medina R et al., 2007, Cloninger et al., 1995), and eating disorders (Dawe and Loxton, 2004). Unsurprisingly therefore, personality traits have also been examined as risk factors for gambling relapse. The main focus of these studies has been on a cluster of highly overlapping and inter-related traits variously described as impulsivity, sensation-seeking, disinhibition and susceptibility to reward.

*3.1.1.1        Impulsivity*

Impulsivity is the tendency to fail to resist an impulse or drive, or temptation to perform a task that can be harmful to oneself or others (American Psychiatric Association, 1993). In everyday terms, it refers to        "behaviour that incorporates a component of rashness, lack of foresight or planning or as a behaviour that occurs without reflection or careful deliberation" (Dawe and Loxton, 2004). Higher self-reported impulsivity has been found to be associated with increased likelihood of taking up smoking, alcohol (Granö et al., 2004) and gambling (Chambers and Potenza, 2003, Pantalon and Maciejewski, 2008) in large non-clinical samples. Elevated impulsivity has also been found to be associated with severity of gambling behaviour and levels of distress amongst gamblers seeking treatment (Steel and Blaszczynski, 1998).

Impulsivity has at various times been seen as a component of "higher order" factors such as Extraversion, Psychotocism (Eysenck et al., 1985) Novelty Seeking (Cloninger et al., 1993) and Sensation Seeking (Zuckerman et al., 1993). However, it has come to be accepted that there are in fact, multiple separable components of impulsivity, including the tendency to give in to strong urges or act rashly when distressed ("urgency", related to neuroticism), excitement-seeking (related to extraversion), the ability to persist completing tasks regardless of emotional state ("self-discipline", related to conscientiousness) and the ability to think through consequences of behaviour before acting ("deliberation", also related to conscientiousness) (Miller et al., 2003).

Urgency and (lack of) deliberation are common predictors of a range of addictive behaviours (Fischer and Smith, 2008, Miller et al., 2003), and it appears that these two dimensions might be especially important in predicting risk of relapse to gambling.

In a study of gambling relapse, Rockloff and Dyer (2007) examined four personality trait predictors, only one of which measured impulsivity: Excess, the inability or unwillingness to inhibit or think about the consequences of destructive behaviours. The other predictors included Escape (motivation to avoid aversive social interactions), Esteem (the need to increase fragile self image) and Excitement (need to alleviate boredom). Only Excess prospectively predicted increases in gambling over the subsequent 12-month period.

Slutske and colleagues (Slutske et al., 2005) conducted the only prospective study of the effects of personality on gambling with a complete birth cohort of 1,037 individuals in New Zealand. Personality profiles of problem gamblers taken at age 18 were compared with those who were alcohol dependent, nicotine dependent, cannabis dependent and without any of these difficulties at age 21. Positive emotionality (low threshold for positive emotions) was unrelated to problem gambling. Negative emotionality as a super-order trait (reaction to stress, aggression and alienation) was prospectively predictive of problem gambling, but not when controlling for co-morbid substance dependence. However, the lower order traits of aggression and alienation remained predictive of problem gambling without substance dependence. Problem gambling without substance dependence was predicted by the super-order trait "Constraint" (self-control, harm avoidance and traditionalism). Thus, impulsivity (converse of self-control and harm avoidance) appears to confer increased risk of problem gambling, and as a stable and enduring characteristic, presumably remains a risk factor for relapse once gambling has ceased.

Goudriaan et al. (2008) investigated the presence of self-reported impulsivity and reward sensitivity, and neurocognitively assessed disinhibition and decision-making under conflicting contingencies, on relapse. The participants in this study (N=46) were pathological gamblers. The authors reported the duration of the disorder and neurocognitive measures of disinhibition and decision-making were powerful predictors of relapse in pathological gambling. The limitation of this study was the small sample size, which limited the number of predictors that could be studied. Intrapersonal factors such as coping skills, and environmental factors such as gambling in relatives and friends, should be explored in future studies, in order to extend the findings of this study. This study of an out-patient problem gambling group without other substance dependence restricts generalisation of these findings (Goudriaan et al., 2008).

### 3.1.1.2   Sensation-seeking

There has been a great deal of research investigating the role of sensation-seeking in gambling. Sensation-seeking has been defined as the "need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experience" (Zuckerman, 1979).

Zuckerman (1979) argued that high sensation-seeking increased vulnerability to gambling because sensation-seekers prefer activities of high physiological arousal, and gambling affords opportunities for high arousal through the uncertainty of outcomes and the excitement of winning. Zuckerman has stated sensation-seeking and impulsivity are "moderately related" (Breen and Zuckerman, 1999

p.1100), but the only distinction offered is that impulsivity is characterised by a lack of planning which is not necessarily characteristic of sensation-seekers.

It is difficult to find evidence of the importance of sensation-seeking in gambling that is not accounted for by impulsivity. High sensation-seeking has sometimes been associated with involvement in a greater number of gambling activities (Coventry and Brown, 1993) and placing higher bets in real (but not laboratory) games (Anderson and Brown, 1984), but not reliably (Coventry and Norman, 1997). Several studies have found gamblers scored below population norms on the Sensation Seeking Scale (Blaszczynski and McConaghy, 1986, Coventry and Brown, 1993, Coventry and Norman, 1997, Dickerson et al., 1987). In a university student sample, Breen and Zuckerman (1999) found the tendency to "chase" (continue gambling following successive losses to recover lost money) was strongly associated with impulsivity, but not sensation-seeking more generally. Sensation-seeking added to impulsivity in predicting gambling frequency for females but not males in a community sample (McDaniel and Zuckerman, 2003). In a broad population of gamblers, sensation-seeking failed to predict pathological gambling (Parke et al., 2004).

Novelty seeking, a sub-component of sensation-seeking, has occasionally been shown to predict or be associated with pathological gambling (e.g., Kim and Grant, 2001, Martinotti et al., 2006). One study found pathological gamblers scored higher on a measure of novelty seeking than people who were alcohol dependent (Tavares et al., 2005). However, these studies have not independently measured impulsivity, so it is not clear whether novelty seeking measures were simply the instruments through which impulsivity traits were expressed.

The main risk sensation-seeking would appear to confer for gambling relapse would be via its association with impulsivity. It may have indirect effects through other as yet unmeasured variables, such as increased range of gambling-associated cues, but to date there is no evidence of direct influence on risk of gambling relapse.

### 3.1.1.3    *Reward dependence*
Reward dependence is defined as the tendency to maintain behaviours previously rewarded due to an elevated sensitivity to reward. Tavares and colleagues (2005) demonstrated reward dependence was a predictor of the strength of urges to gamble among pathological gamblers. It has been argued that reward dependence or sensitivity is not simply a component of impulsivity (Franken and Muris, 2006), so independent assessment of its contribution to gambling relapse may be warranted.

### 3.1.1.4    *Extraversion*
At one time extraversion was posited to be associated with gambling. However, numerous studies have failed to find any significant association between either extraversion or intraversion, and gambling or pathological gambling (Bagby et al., 2007, Malkin and Syme, 1986, Steel and Blaszczynski, 1996).

## 3.1.2    Co-morbidity
Co-morbidity refers to the presence of two or more disorders or disease processes. The presence of a co-morbid condition is often assumed to be associated with poorer outcome from treatment of the primary condition. To the extent that co-morbidity interferes with the maintenance of treatment gains, it would be expected to increase risk of gambling relapse.

### 3.1.2.1   *Co-morbidity prevalence rates*
There is a high rate of co-morbid substance use and psychiatric disorders among those who meet criteria for Pathological Gambling. The largest survey of co-morbidity rates to date is the National Epidemiological Survey on Alcohol and Related Conditions (NSEARC), which surveyed 43,093 United States adults from 2001-2002, and which found an overall lifetime prevalence rate of 0.42%

for pathological gambling (Petry et al., 2005). Of pathological gamblers, 73.2% had alcohol use disorders, 60.8% had personality disorders, 60.4% met criteria for nicotine dependence, 49.6% had a mood disorder, and 41.3% had an anxiety disorder. A NSEARC survey of older people (aged 60 or more years) also found significantly elevated prevalence of alcohol use, personality, nicotine, mood and anxiety disorders among those with both lifetime recreational and pathological gambling histories (Pietrzak et al., 2007).

There is evidence that co-morbid psychiatric disorders are associated with an increased risk of developing problematic or pathological gambling. Scherrer et al. (2007) interviewed twins from the Vietnam Era Twin Registry who had indicated symptoms of pathological gambling as part of a broader psychiatric diagnostic interview 10 years earlier (i.e., 1992). The absence of psychiatric disorders in 1992 was predictive of a reduced risk of pathological symptoms 10 years later. After controlling for 1992 pathological gambling symptoms, 1992 depression or dysthymia was predictive of problem gambling (symptoms of pathological gambling but too few to meet full criteria). Nicotine dependence, drug dependence, Post Traumatic Stress Disorder (PTSD), and Antisocial Personality Disorder were all associated with a 4-10 times increased likelihood of pathological gambling 10 years later.

Particular concerns about the role of alcohol in gambling relapse have been raised by clinicians, but the findings are inconsistent. Heavy pre-treatment alcohol use has been demonstrated to be predictive of poorer response to gambling treatment (Echuburua et al., 2000), but elsewhere to not affect treatment outcome (Toneatto et al., 2002).

### 3.1.2.2 Impact of Parkinson's disease on gambling

Dopamine agonist medication is commonly used to treat the symptoms of Parkinson's disease; it has recently been suggested that the use of such medication may be associated with increased risk of compulsive gambling. Singh et al. (2007) surveyed compulsions in 300 people with Parkinson's disease. Twenty-eight self-reported compulsive gambling, with 17 of these (5.6% of the total sample) meeting criteria for Pathological Gambling. Molina et al. (2000) found that of 12 people with diagnoses of Parkinson's disease and pathological gambling, gambling onset followed L-dopa treatment for Parkinson's disease in 10 cases.

### 3.1.2.3    Co-morbidity and risk of relapse

There is little evidence at present that co-morbid conditions interfere with treatment outcome or impair the maintenance of treatment gains. However, this could reflect the immaturity of gambling treatment research, with a limited number of good quality outcomes studies with well measured predictor variables (Toneatto and Ladouceur, 2003, Pallesen et al., 2005). One recent study found co-morbid PTSD, anxiety, depression or use of alcohol were not predictive of treatment outcome for veterans in gambling treatment (Biddle et al., 2005).

Only two studies to date have reported predictors of relapse following gambling treatment. McCormick and Taber (1988) found that although attributional style was predictive of gambling severity 6 months post-treatment, measures of depression were not. More recently, Jimenez-Murcia et al. (2007) found obsessive-compulsive symptoms predicted drop out from a 16-week Cognitive Behaviour Therapy program, and that psychopathological distress predicted relapse. Thus, there is limited direct evidence of the impact of co-morbidity on gambling relapse.

### 3.1.3    Cognitive factors

### 3.1.3.1 Outcome expectancies

Outcome expectancies are the beliefs one holds about how two or more particular environmental events or objects are related. Expectancies have an "if-then" quality: when an environmental event fulfils the "if" condition, another event is expected to follow (Goldman et al., 1987). Behaviour will be more likely when it is expected to lead to desirable outcomes than otherwise.

There is a large volume of research into outcome expectancies of drinking alcohol. Greater self-reported alcohol consumption is consistently associated with expectation of increased likelihood of a range of pleasurable effects (e.g., feeling happy, feeling more sociable), and to a lesser extent, decreased likelihood of unpleasant effects (e.g., feeling sick, becoming aggressive) (Stacy et al., 1990, Grube et al., 1995).

The predictive utility of expectancies may depend on their specificity. For example, one's beliefs about the effects of alcohol on others in general may be different to one's beliefs about the effects of alcohol on oneself. This is indeed the case for pathological gamblers who expect their probability of success to be better than others (Bellringer, 1999). While alcohol expectancies are reliably associated with alcohol-related problem frequency, the magnitude of the relationship is small and leaves much variance unexplained (Reese et al., 1994). A subset of expectancies, motives (or reasons for, functions of, or perceived benefits of engaging in a behaviour) constrains the study of expectancies to those that are valued expected consequences, relevant to personal decisions to engage in the behaviour. Motives would be expected to be more predictive of behaviour than more general expectancies.

Studies have consistently found that drinking to avoid or escape unwanted emotional states is associated with an increased number of alcohol-related problems, even after controlling for alcohol consumption (Cooper et al., 1994, Lynne Cooper et al., 1988, Glynn et al., 1983, Thombs and Beck, 1994). Moreover, other studies have found that people experiencing the greatest number of alcohol-related problems endorse nearly all reasons for drinking as important (McCarty and Mckaye, 1984, Klein, 1992). On the other hand, drinkers who do not experience alcohol-related problems, tend to drink for the achievement of desirable outcomes, but not for the alleviation of negative affect. Similar patterns have been found for other drugs (Aarons et al., 2001) and for adolescent gambling (Gupta and Derevensky, 1998). Perceived functions of drug use have been demonstrated to account for a significant proportion of the variance in polydrug-related problems in adolescents after controlling for demographic variables (Boys and Marsden, 2003).

*3.1.3.2 Outcome expectancies in alcohol relapse*

Positive expectancies appear to influence risk of relapse following behaviour change. The extent to which drinkers continue to expect positive reinforcement from alcohol at the end of treatment prospectively predicts increased risk of relapse 12 months post-treatment (Brown, 1985) and increased drinking over 18 months post-treatment (Connors et al., 1993). Models of relapse that incorporate expectancies have appeal, as these appear to be amenable to treatment. Brown and colleagues (1998) have demonstrated that it is possible to change alcohol outcome expectancies in inpatient treatment.

It is important to distinguish studies that have used treatment and community samples. Studies of non-clinical populations have found that alcohol expectancies contribute additional variance to drink refusal self-efficacy, in the prediction of consumption levels (Flaga, 1999, Lee et al., 1999). Outcome expectancies have generally not contributed to the prediction of post-treatment drinking when self-efficacy has also been measured in studies using clinical samples (Oei et al., 1998, Solomon and Annis, 1990).

*3.1.3.3 Gambling outcome expectancies*

Gambling outcome expectancies have been little researched to date. One study of adolescents found that increased gambling outcome expectancies were predictive of problem gambling in males but not females. Expectancies of enjoyment/excitement, feeling autonomous and socially accepted, winning money and preoccupation/loss of control were most predictive of problem gambling (Gillespie et al., 2007). The outcome expectancy of winning money appears particularly important in initiating and maintaining gambling (Bellringer, 1999). One study found that expectations of winning influenced physiological arousal levels while playing video lottery machines. Participants reported playing was less exciting when playing for "fun" rather than the possibility of winning money (Ladoucer et al., 2003). Thus, researchers investigating the role of gambling outcome expectancies in relapse could reasonably expect to draw on the drug and alcohol outcome expectancy literature, but should also include measurement of expectancies of winning money.

*3.1.3.4   Self-efficacy*

Self-efficacy refers to beliefs one has about one's ability to execute particular actions (Bandura, 1977). Within the addictions field, most attention has been given to individuals' beliefs about their ability to resist urges, and cope with (remain abstinent in, i.e., abstinence self-efficacy) situations in which they have used drugs or alcohol in the past (i.e., high-risk situations).

Self-efficacy beliefs about the ability to remain abstinent and cope with high-risk situations for relapse consistently predict relapse rates in people treated for alcohol dependence (Goldbeck et al., 1997, Maisto et al., 2000, Mckay et al., 1993). The more confident one is that he or she can cope with factors such as cravings, unwanted emotion, interpersonal conflict, peer pressure and environmental cues, the less likely he or she is to relapse.

Studies following up participants who have received treatment have reinforced the importance of self-efficacy in achieving long-term recovery from pathological gambling. In a 6- and 12-month follow-up of pathological gamblers treated with cognitive behaviour therapy, those who were no longer considered pathological gamblers had a greater perception of control of their gambling problems and increased self-efficacy in situations of high risk (Ladoucer et al., 2001, Sylvain et al., 1997).

One of the disadvantages with self-efficacy as a predictor is that self-efficacy has not proven particularly amenable to treatment. For example in Maisto and colleagues' (2000) study, while self-efficacy predicted post-treatment drinking levels, self-efficacy was not altered by a treatment program designed to increase it, and self-efficacy did not mediate treatment outcomes.

*3.1.3.5        Cognitive biases and beliefs about gambling*

Toneatto (1999) identified a range of gambling-related beliefs and information processing biases, listed and defined in Table 2. Most of these beliefs and processes would theoretically contribute to gamblers overestimating the likelihood of winning and attributing wins to predictable, manipulable factors rather than uncontrollable, chance factors (Bellringer, 1999). Cognitive biases appear to interfere with gamblers' ability to learn from their "track record" of experience (Delfabbro and Winefield, 1999, Sharpe, 2004).

Laboratory studies using volunteer student samples typically identify high rates of irrational thinking during gambling tasks (Walker, 1992). Measures of illusion of control and belief in personal luckiness have been shown correlate highly with measures of pathological gambling in a university sample of pathological, problem and probable problem gamblers (MacKillop et al., 2006), and significantly higher in pathological gamblers than non-pathological gamblers (Mackillop et al., 2006, Moore and Ohtsuka, 1999).

Studies of cognitive therapy aiming to correct cognitive errors have produced both reductions in gambling behaviour and reductions in illusion of control and belief in luckiness (Dowling et al., 2007, Sylvain and Ladouceur, 1992, Sylvain et al., 1997). On the other hand, improving mathematical understanding of the odds of gambling does not necessarily change gambling behaviour (Williams and Connolly, 2006). In one of the few relevant gambling relapse studies, a follow-up of 75 members of a Gambler's Anonymous (GA) fellowship found that gambling urges and erroneous cognitions increased vulnerability of a relapse (Tian and Gordon, 2007).

*3.1.3.6   Cognitive symptoms of pathological gambling*

In addition to the beliefs and biases above, cognitive symptoms of pathological gambling may be particularly influential in maintaining the disorder, or in leaving abstinent gamblers vulnerable to relapse. Some gamblers become obsessed with the anticipation of the next wager and preoccupied with thoughts of obtaining money to keep gambling (Blaszczynski, 1998). Those who gamble to excess report increased obsessional thoughts, including the fear they may miss an opportunity to win, fantasies about winning and what they will do with winnings (Blaszczynski, 1998). Although it

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remains untested, it may be that these key symptoms of pathological gambling confer increased risk of relapse.


Table 2. Cognitive biases in problem gambling.

**Superstitious beliefs** that chances of winning can be increased by possessing specific objects (Talismanic superstitions), performing certain acts or rituals (Behavioural superstitions), or mental acts or beliefs (Cognitive superstitions)

**Gambler's fallacy**: belief that every segment (however small) of a random sequence must represent the proportions in the long run sequence (representative heuristic)

**Chasing**: belief that the only way to recover gambling losses is through further gambling

**Anthropomorphism**: attributing human qualities to objects (e.g., gamblers may embrace machines when they win, and verbally abuse them when they lose)

**"Learning from losses"**: Losses interpreted as experiences from which one can learn and improve one's skill

**Hindsight bias**: retrospective evaluation of betting choices as correct or incorrect based on the outcome (win/loss)

**Temporal telescoping**: Assumption wins will occur sooner rather than later, and to self rather than others (in absence of ability to precisely predict wins)

**Selective memory**: Increased recall of wins, poorer recall of losses.

**Illusory correlation**: Attributing wins to contiguous environmental cues

**Illusion of control**: Belief that one can influence chance outcomes

> **Luck is uncontrollable**: belief that luck is not controllable but is nevertheless orderly and predictable. Belief there may be skill in discerning when cycle of bad luck "turns good"
>
> **Luck is controllable**: belief that luck may be manipulable via superstitions
>
> **Luck is a trait:** belief that some are luckier than others
>
> **Luck as contagion:** belief that success in one area of life increases probability of success in others (including gambling)


### 3.1.4 Urges, craving and physiological arousal

Marlatt and Gordon (1985) have defined an urge as "a relatively sudden impulse to engage in an act" and a craving as "a subjective desire to experience the effects of consequences of a given act." However, this distinction is by no means universal and the terms are often used interchangeably. According to social learning theory, the experience of either an urge or a craving is thought to be caused by the anticipated immediate enjoyment and pleasure associated with the indulgent act and its affective consequences (although note from other theoretical perspectives it is not necessary to postulate expectancies as a mediating variable (Hayes and Brownstein, 1986)). It has been argued that craving and urge experiences may result from physiological, conditioning or cognitive processes. According to some models of addiction, urges are mediating variables that increase the likelihood of engaging in problematic behaviour (Drummond, 2001). For example, Marlatt argued that high craving could undermine self-efficacy by challenging the individual's coping skills (Marlatt and Gordon, 1985).

Urges to gamble often immediately precede engagement in pathological gambling behaviour (Potenza et al., 2003). Blanchard and colleagues (2000) demonstrated that pathological gamblers display arousal specific to cues that had formerly preceded gambling. Pathological gamblers were more physiologically reactive in comparison with matched non-gamblers to descriptions of their preferred gambling activities. Regular gamblers experience cravings to gamble and pathological gamblers experience cravings more frequently than non-pathological gamblers (Castellani and Rugle, 1995). Interestingly, two studies have demonstrated that pathological gamblers experience more intense urges than alcohol dependent people (Tavares et al., 2005, de Castro et al., 2007). However, recently the causal role of physiological events in gambling urges has been questioned. In this study, gamblers

reported feeling more symptoms of anxiety and physiological arousal during and following gambling than during their urges to gamble before gambling (Gee et al., 2005).

Whatever urges are, gamblers themselves report that they play an important role in relapse. In one of the few studies to directly investigate gambling relapse, Hodgins and el-Guebaly (2004) found that 11% of gambling relapses were retrospectively attributed to giving in to urges. Furthermore, Oei and Gordon (2007) found higher ratings on urge measures for Gamblers Anonymous clients who relapsed than those who remained abstinent post-membership.

### 3.1.5    Emotional states: negative affect

Negative affective states have long been thought to increase risk of relapse to drug and alcohol use (Witkiewitz and Marlatt, 2004). However, the relationship between negative affect, outcome expectancies and drug use is unclear. Some studies have found that while negative affect and urges are strongly related, outcome expectancies are still stronger predictors of actual behaviour, such as smoking (Brandon et al., 1996).

There are individual differences in negative affect and in affective reactivity to provocation. An experimental paradigm has been developed in which the response to stressful provocation has been compared between those who have managed to delay relapse and those who have failed to achieve abstinence for more than 24 hours ("immediate relapsers"). Smokers who were immediate relapsers showed higher baseline negative affect and demonstrated stronger reactivity to a stressful task than delayed relapsers (Brown et al., 2002). Daughters et al. (2005) observed the same effect in problem gamblers.

The role of negative affective states may be less important than individuals' ability to tolerate them. Brandon and colleagues (2003) found that persistence through a stressful task prospectively predicted continuous abstinence among smokers throughout the following 12 months. Similarly, Daughters, Lejuez, Kahler and colleagues (2005) found that the duration of the most recent abstinence attempt among drinkers in a residential treatment centre was related to persistence on a psychological stressor task, even controlling for negative affect. Likewise, the effects of negative affect may be mediated through self-efficacy beliefs (Gwaltney et al., 2001), which may incorporate self-knowledge about distress tolerance.

The primacy of negative affect in gambling relapse is uncertain. Levels of depression have been shown to relate to the severity of gambling urges (Tavares et al., 2005). On the other hand, arguments for the importance of negative affect in drug use and relapse have emphasised withdrawal states as the major contributing factor (Baker et al., 2004), which may not be relevant to gamblers.

### 3.1.6    Social support

The importance of the presence and quality of social networks in maintaining substance use disorders has been researched extensively, and appears equally applicable to gambling. Members of social networks may serve to monitor or ignore an individual's behaviour, model helpful or maladaptive behaviour or fail to provide modelling, provide adaptive or maladaptive normative expectations of behaviour, provide opportunities for alternative behaviour, dispense or withhold social rewards, and influence self-esteem and skill development. Family members and friends who provide social bonds, goal direction and monitoring by maintaining a cohesive and well-organised family promote engagement in social and recreational pursuits. This helps to protect recovering individuals from exposure to substance use or problematic behaviour, strengthen abstinence-oriented norms and models, and build recovering individuals' self-efficacy and coping skills, increasing the likelihood of stable remission. Family members and friends who create stressors or alienation by directing disapproval or antagonism toward a recovering individual, or who model and reinforce substance use or problematic behaviour, increase the possibility of relapse (Moos, 2007).

There has been limited research on the role of social support in gambling relapse. It has been suggested that loneliness (or alienation) could be either a consequence or a vulnerability factor for

problem gambling (Trevorrow and Moore, 1998). In one study, spousal involvement in Gamblers Anonymous did not improve relapse rates (Zion et al., 1991), although arguably this is a limited indicator of social support. Furthermore, in a study following up 75 Gamblers Anonymous members, the presence of supportive social networks was associated with longer periods of abstinence (Oei and Gordon, 2008). It seems likely that social support would remain important in gambling relapse, as it is for alcohol relapse, but it remains to be demonstrated empirically.

### 3.1.7 Gambling environments

To those who are unable or unwilling to avoid contact with gambling environments, the qualities of these environments could play an extremely important role in risk of relapse. Operant and Pavlovian conditioning theories of behaviour emphasise the role of cues to elicit affective and behavioural response tendencies. It is likely that cues also vary in their potency as cues, through their perceptual salience or effects as unconditioned stimuli.

#### 3.1.7.1 Gambling games

The structural characteristics of certain games can encourage an individual to gamble (Aasved, 2002). For example, the use of chips and tokens instead of money helps the individual avoid any memories or cognitions about the everyday value of the money that actual cash might elicit. Certain mechanical features of electronic gaming machines such as the ratio of winning to losing symbols can inflate the perceived chances of winning, perhaps taking account of natural cognitive biases such as the representativeness heuristic (gambler's fallacy).

#### 3.1.7.2 Environmental stimuli at gambling venues

Environmental stimuli at gaming venues are important in the initiation and maintenance of problematic gambling for two reasons: 1) they create conditions highly conducive to enduring, repetitive gambling patterns; and 2) they provide salient cues which retain their ability to elicit gambling behaviour even after abstinence has been established.

Many features of gambling venues fulfil the function of establishing operations to increase the reinforcement value of gambling. For example, providing high levels of sensory stimulation such as flashing lights and loud music on electronic gaming machines may sensitise people to further excitement-seeking and risk-taking. Background music has been found to influence electronic game machine preference (Parke and Griffiths, 2005).

Other venue stimuli may not sensitise gambling per se, but provide valued functions that will lure and reinforce remaining in the venue, prolonging the opportunity to engage in gambling. For example, many electronic gaming venues provide free coffee or soft drinks, friendly service from staff, the opportunity for company without the risks or effort of social interaction, and security guards; any of which may be especially valuable to lonely people with low incomes.

On the other hand, not all aspects of the environment inherently influence gambling. For instance, Dixon et al. (2007) randomly assigned participants to music of different tempos and found no effect on gambling behaviour. There is considerable scope to further investigate the potency of gambling environmental cues to elicit relapse.

### 3.1.8 Availability of gambling

There is clear evidence that proximity to electronic gaming venues is associated with increased likelihood of problematic gambling. In a national US phone survey, the availability of a casino within 10 miles of the respondent's home was positively related to the likelihood of problem or pathological gambling (Welte et al., 2004). In Australia, the rates of problem gambling tend to be more significant in areas where per capita expenditure on non-lottery gambling is highest, i.e., in states such as Victoria and New South Wales. It is the lowest where expenditure is lowest, such as Tasmania and Western Australia (Productivity Commission, 1999).

In South Australia, a survey of over 17,000 adults found that 44.7% of all those who played poker machines usually gambled at the closest venue to their home, with the rate rising to 65.8% for moderate to high risk gamblers (Taylor et al., 2001). Furthermore, there are higher prevalence rates of problem gamblers in suburban areas where there is a density of 10 or more electronic gaming machines (EGMs) per 1000 adults than other areas, and a positive association between clients in gambling treatment and density of EGMs in their suburban area (Delfabbro and Lacouter, 2006).

Venues pose two key risks to gambling relapse which close proximity exacerbates: 1) the opportunity to engage in gambling; and 2) cues serving to elicit thoughts and urges to gamble. We are not aware of formal investigations into the influence of venue proximity to gambling relapse. We would expect both a direct effect and an effect mediated through urges and cognitions on relapse rates.

### 3.1.9    Summary

Relatively few studies have directly examined predictors of gambling relapse. Studies employing the strongest methodologies, either true experiments or prospective designs, provide support for the role of disinhibition and impaired decision-making, gambling urges as predictors of increased likelihood of gambling relapse and tolerance of negative affect as predictive of delay to gambling relapse. The relationship between self-efficacy and relapse is supported in other addictions. There is reasonably strong evidence that impulsivity and related personality traits, certain co-morbid psychiatric disorders (Antisocial Personality Disorders and Substance Use Disorders have the strongest support), gambling expectancies (especially expectancies of winning) and gambling availability contribute to frequency and intensity of gambling behaviour. Although these have not been directly studied as factors in gambling relapse, they are likely to be promising candidates for future research into gambling relapse predictors. There is weak and inconsistent support for sensation-seeking and reward dependence as related to gambling behaviours and other predictors.

Due to the limited number of studies, the inter-relatedness of many of the variables, and the lack of studies which have investigated the role of each factor in the context of others, it is difficult to know which factors make significant unique contributions to gambling research. There is scope for much more detailed exploration.

## 3.2 Qualitative Studies

A rich contextual understanding can be obtained from an individuals' interpretation of events (Patton, 1990), therefore the following section uses qualitative studies in an attempt to further understand the predictors of relapse in problem gambling. There was only one study that directly examined relapse. This was a component of another study, with the remaining studies of gambling investigating the genesis and development of the problem. These studies have also been reviewed, as they illuminate factors that might be common to inducing gambling in current and recovered gamblers.

In addition literature on other addictions has been included in this review as this helps to develop our understanding further in relation to the predictors of relapse. Studies that are directly relevant to relapse will be reported first in each section.

### 3.2.1 Gambling

Table 3 provides a summary of the qualitative studies of relapse or associated with relapse reported in this review. These studies will be reported in more detail below.

Table 3. Problem gambling qualitative studies of relapse or associated with relapse.

| Study | Design | Analysis | Factors reported to be important |
|---|---|---|---|
| Thygesen & Hodgins (2003)<br><br>Explored why and how gamblers terminated a relapse episode. | Semi-structured Interview (N=60) | Content analysis. | Reasons for terminating relapse: monetary factors, affective factors, re-appraisal and external constraints. Strategies for stopping gambling: cognitive or behavioural, stimulus control, self-liberation, counter conditioning and helping relationships. |
| Ricketts & Macaskill (2003)<br><br>Explored the nature of problem gambling | Qualitative experiences of (N=14) male problem gamblers using semi-structured interviews | A grounded theory approach for the analysis. | Gambling was used to induce or suppress arousal for those with poor coping strategies. Poor tolerance of emotional discomfort and a weak view of their behavioural control. |
| Morasco et al. (2007)<br><br>Summarises cognitive and behavioural factors which promoted and inhibited gambling behaviours. | Data was obtained from structured worksheets (N=84) | Responses were coded and assigned to categories. | Gambling triggers: a lack of structured time, negative emotional states and past reminders of gambling. Positive consequences of gambling: enjoyment associated with winning and gambling as an escape.<br>Negative consequences of gambling: depressed mood, financial problems, and conflict with family. |
| Thomas et al. (2008)<br><br>Reviewed factors contributing to maintenance of problem gambling. | Semi-structured interviews<br>Problem gamblers (N=13)<br>Gambling counsellors (N=6) | A combination of grounded theory and interpretative phenomenological techniques to analyse the data. | EGM venues: highly accessible and enticing. The environment: private and companionable. EGM games: entertaining and distracting. Reliance on gambling: poor social support, limited social spaces and maladaptive coping habits. |
| Wood & Griffiths (2007)<br>Examined the role and the extent gambling was used for coping. | N=50 problem gamblers. Structured interviews were conducted to establish the participant's experiences of how gambling had developed and the role gambling played in their lives. | Data were subject to open and axial coding. Category development was verified between the authors. | Gambling offered an escape through the modification of the subject's mood. Escape was the main characteristic that facilitated the continuation of problem gambling. |
| Doiron & Mazer (2001)<br><br>Investigated what attracted those with gambling problems to Video Lottery Terminal gambling. | Semi-structured interviews (N=7) | Textual analysis using a grounded theory framework. | Pre-involvement in gambling: lack of meaningful relationships, problematic relationships and feelings of loss. Early involvement was a means to try to "fill the void." Increased involvement: relationships, focused engagement, emotional highs or lows, escapism and competition.<br><br>Difficulties stopping gambling: emotional difficulty of quitting and strategies used to break the habit. |

Thygesen and Hodgins (2003) examined the reasons and strategies used by problem gamblers to terminate a gambling relapse by administering the participants with the Relapse Experience Interview (REI) (Marlatt and Gordon, 1989). Factors such as running out of money, disliking the feelings of losing, impact on relationships and accessibility to venues were important in relapse termination. Stimulus control by limiting access to money or avoiding venues, self-liberation by saying "no" or using will power, counter-conditioning by keeping busy, and helping relationships were the main strategies used to reduce gambling relapse. Participants preferred either cognitive or behavioural therapeutic strategies, rather than utilising both. Limitations of this research included some interviewers using minimal probing and focusing on terminating gambling on the day in question. Retrospective self-reports do, however, result in individual and recall bias (Thygesen and Hodgins,

2003). Environmental factors, the expectancy of winning money, enjoyment and excitement were considered to be important in the initiation and maintenance of gambling behaviours in the initial review.

Ricketts and Macaskill (2003) explored the nature of problem gambling in 14 male problem gamblers using semi-structured interviews. The authors reported that gambling was used to either induce or suppress arousal for those with poor coping strategies. Gambling modified their mood states by enabling them to shut off emotional discomfort and because they perceived their capacity for behavioural control to be weak. The combination of financial problems and access to funds was associated with the commencement or continuation of gambling. Cognitions about winning were associated with an increased persistence with gambling. This perceived loss of control by problem gamblers in relapse episodes contributed to emotional distress, which was mediated by a lack of understanding about their gambling and a belief that they ought to be able to achieve control over this behaviour simply by using will power. The repeated failure of control resulted in a tolerance of high levels of costs and repeated cycles of gambling. It was also suggested that those who are more confident in their ability to cope with cravings, unwanted emotions and conflict were less likely to relapse. The limitations of this study included the use of only male treatment-seeking gamblers (Ricketts and Macaskill, 2003).

Morasco et al. (2007) conducted a qualitative study with pathological gamblers to summarise the factors that promoted gambling triggers and factors that inhibited gambling behaviours. Qualitative data were obtained from structured worksheets during each of the 8 structured CBT sessions. Participants were treated in a clinical trial that examined the efficacy of cognitive behavioural therapy (CBT). Gambling triggers were associated with a lack of structured time and negative emotional states such as depression or a bad day at work. Past reminders of gambling such as advertisements or money were also identified as promoting gambling (Morasco et al., 2007).

Thomas et al. (2008) used semi-structured interviews with 13 problem gamblers and 6 gambling counsellors to develop a theoretical model for determining structural and situational characteristics of problem gambling. Electronic Gaming Machine (EGM) venues were considered to be highly accessible and enticing, and the environment both private and companionable. EGM games were described as entertaining and a diversion for gamblers from their current life situation. Poor social support, limited social spaces where people can go in their community for casual social interaction and maladaptive coping habits contributed to reliance on gambling (Thomas et al., 2008). The small sample size limits the generalisability of these findings, however high levels of sensory stimulation such as flashing lights and gaming machine music were identified earlier in this review as increasing the reinforcement of gambling.

Wood and Griffiths (2007) examined the role and the extent to which gambling was used for coping for 50 problem gamblers using a basic interview guide. The main theme was that gambling offered an escape through the modification of the subject's mood. This was achieved through fantasies, dissociation and changes in arousal. Some problem gamblers identified mood modification as a main reason to gamble; for others it was a way of filling the emptiness and avoiding problems. The factors that influenced the need to gamble were either control beliefs or the regret of losing money. Escape was the main issue identified as supporting continued problem gambling. The authors considered that those who are able to cope with unwanted emotions and environmental cues were less likely to relapse. This study is limited by the potential recall bias of participants (Wood and Griffiths, 2007).

Doiron and Mazer (2001) conducted an exploratory and descriptive study into the experiences of Video Lottery Terminal (VLT) gamblers using semi-structured interviews. The authors reported that difficulties associated with stopping gambling included emotional difficulty of quitting and the development of strategies to break the habit. Three hypotheses were raised: that problems in relationships contributed to the occurrence of problem gambling; that VLT addiction can become overwhelming and an important relational experience: and that VLT addiction develops gradually and is a process over which gamblers can exercise some degree of choice (Doiron and Mazer, 2001).

### 3.2.2 Summary of qualitative gambling studies

These qualitative studies of problem gambling suggest that relapse is a process wherein there are initiation, cyclical relapse and cessation phases in the experience of problem gambling.

There was little information about the initiation of relapse other than from aetiological studies. Such studies suggested that the initiation of gambling is associated with external stimuli such as advertisements and money, and internal stimuli such as cravings, positive memories of gambling, emotional conflict or negative emotional states, financial problems, access to funds and lack of structured time. Such factors could then operate in the initiation of relapse episodes.

The data also showed that persistent cycles of relapse alternating with control were maintained by positive cognitions about winning and also with negative cognitions and affects associated with poor social support, relationship issues, limited social spaces, difficult psychological and/or psychosocial states and maladaptive coping habits. . Termination of a relapse episode was associated with monetary factors, affective factors, reappraisal and external constraints and strategies such as cognitive or behavioural, stimulus control, self-liberation, counter-conditioning and helping relationships.

Causation in relation to cessation of gambling as a whole was not clearly demonstrated. There is scope for more in-depth exploration of these factors as possible predictors of relapse in gambling behaviour. As limited qualitative data exists about relapse in problem gambling, qualitative studies in other addictive behaviours were also reviewed.

## 3.3 Substance abuse

Ouimette et al. (2007) have examined relapse using clinical interviews. Predictors of relapse included lack of support and role participation, self-perceived weakness, pessimism and poor relationships with parents. Distant events such as childhood abuse and the occurrence of PTSD made relapse more likely. Treatment including spirituality, CBT, group therapy and problem focussed coping strategies for relapse prevention were all linked to a reduced incidence of relapse. Triggers for relapse were identified as negative emotional states such as sadness, loneliness and frustration where substance use served to block or numb pain. Substance dependence and withdrawal related to ongoing regular use and were predictors of lapse-relapse. Environmental factors including social pressure to use, location and availability also made relapse more likely. Engagement in avoidance activities and relapse prevention were considered important in reducing relapse. PTSD related to relapse in a more complex way and was clearly the principal reason for relapse in those subjects with ongoing symptoms (Ouimette et al., 2007).

There were two semi-structured and in-depth interview studies of relapse in substance abusing women (Sun, 2007, Harris et al., 2005). In these studies, four major themes were established that contributed to relapse: low self-worth and how this impacted on intimate relationships with men, interpersonal conflict, negative emotions, and a difficulty separating from those using substances. Lack of drug-related knowledge and relapse prevention skills were also predictive for relapse. Semi-structured interviews were used to establish that negative affects (depression and despair) and destructive habits and patterns (including conflict), and the lack of personal control were also likely to lead to relapse (Harris et al., 2005). Individual relationships and involvement in a recovery community, self-awareness and a sense of purpose, meaning, and spirituality were also important in reducing relapse. Some clients required specific problem-solving approaches involving cognitive-behavioural techniques as essential in sustaining recovery. Individual relapse prevention skills by themselves were considered insufficient to sustain abstinence and leave clients vulnerable to relapse. Self-esteem issues were also important for all clients, but they were particularly central for some who were required to specifically address this issue to reduce their personal vulnerability to relapse (Harris et al., 2005).

There were two studies with clients with dual diagnoses of substance use and mental disorder, which used a focus group methodology (Davis and O'Neill, 2005, Bradizza and Stasiewicz, 2003). They found that high-risk drug and alcohol use situations involved psychological symptoms, positive and negative affect, reminders of substance use, being around people who use drugs and alcohol,

interpersonal conflict, offers of drugs or alcohol, experiencing loss, receiving money, loss of appetite, and being abstinent as triggers for relapse. The following themes were reported to reduce relapse: secure housing, positive social support, prayer or "higher power", meaningful activities, and having a different perception of life. Other strategies included eating regularly, adequate sleep patterns, and personal appearance.

Kelemen et al. (2007) conducted a qualitative analysis using thematic analysis of word-for-word speeches by substance-abusing women graduating from the program who were continuing their progress in recovery and those who relapsed some time after graduating from the program. The authors observed that spirituality played an important role for those who recovered. In the relapse group a lower level of self-care, missing spiritual experiences and not wanting to come up to sober community expectations were evident. The limitations of this study were the small size and the specific context of the sample from a Hungarian therapeutic community.

### 3.3.1 Summary of substance use

Qualitative studies examining relapse in substance use disorders appear to have considerable commonality with those in problem gambling. Whilst there is not a clear pattern, each of the studies describe a dynamic process with considerable variability.

Common factors identified as being precipitants for relapse universally identified negative affects including loss, self-esteem issues, an absence of meaning and purpose in life as well as urge and craving with substance dependence and withdrawal, depression, despair and conflict as clearly important. Dual diagnosis issues, especially personality traits such as risk-taking behaviour, PTSD and serious mental illness all increased relapse risk. Specific environmental triggers were also identified including meeting other drug users, availability and receiving money. Reduction of vulnerability to relapse was considered to result from treatments of various types: relapse prevention skills, the use of cognitive-behavioural techniques, specific problem-solving, avoidance and distraction coping strategies as well as addressing spiritual issues. Social support and the development of positive and meaningful relationships also enhanced self-worth and were considered to protect against relapse.

### 3.4 Alcohol dependence

Alati et al. (2003) used a qualitative study comprising 63 stories collected through a survey to determine relapse prevention options for Indigenous clients of alcohol and drug intervention services. The authors identified community environments as a strong influence on success at quitting. The authors commented that the participants believed belonging to a group was the main reason for relapse to heavy drinking. Most implied a link to a reunion with the family group, and the recovery of a social identity. Spontaneous remission was related to the longest abstinence and appeared to be the most successful route for sustained abstinence. The limited sample makes it difficult to apply results to clients who have not undergone treatment (Alati et al., 2003). The support provided by members attending gamblers anonymous was found to provide similar positive outcomes for prolonging abstinence.

### 3.5 Smoking

Jonsdottir and Jonsdottir (2007) compared the experience of women with chronic obstructive pulmonary disease (COPD) with relapse to smoking. The authors identified the folowing themes: being caught in a web by their disease; shame related to smelling of cigarettes; ambivalence about quitting and failure of their attempts to quit; cigarettes providing support when times are difficult; and counter-productive effects resulting from negative comments from health care professionals.

Participants had a severe disease, making quitting all the more important. Nevertheless, excuses for smoking included many overt and covert justifications, addiction, the time not being right to quit, trying to quit in a hurry, stress factors including pressures and threats, financial difficulties, alcoholism or emotional problems. When the participants were struggling to quit they often lost control and smoked, often becoming seriously ill (Jonsdottir and Jonsdottir, 2007).

**3.6 Conclusions from the qualitative studies**

Taken together the qualitative studies on relapse suggest that relapse is common in all addictive behaviours, including problem gambling.

In problem gambling the relapse was described as a process, but this was not as clear in other addictive behaviours where other issues that were specific to individuals were particularly important. They described a dynamic process with considerable variability. Examples of this included specific substance dependence and withdrawal, abuse and PTSD, or other co-morbidity such as COPD, personality traits such as risk-taking behaviour, cultural and Indigenous issues, self-esteem and the chance meeting of people who also use substances.

Nevertheless there were a number of commonalities. These included triggers such as environmental stimuli; internal stimuli such as urges or cravings and negative emotional states including existential issues. Conversely, reduction of vulnerability to relapse was also very similar across the addictive behaviours, including the positve effects of treatments, self-esteem and the importance of positive relationships, spirituality and social support.

## 3.7 Conclusions

Relatively few studies have directly examined predictors of gambling relapse. The qualitative studies complemented the initial literature review and together provided more complete information about relapse in problem gambling.

Studies employing the strongest methodologies, either true experiments or prospective designs provided support for the role of disinhibition, impaired decision-making, and gambling urges as predictors of increased likelihood of gambling relapse. These studies also identified tolerance of negative affect as predictive of delay to gambling relapse. Similar factors are also described in the qualitative studies across the addictive behaviours. In addition, qualitative studies in problem gambling relapse suggest that there is a process that develops to engender the problem gambling state and that maintains it in a cycle of repeated lapses and relapses and can be managed or ceased by the use of treatments and positive changes in people's lives.

The relationship between self-efficacy and relapse has been observed in other addictions. There is reasonably strong evidence for the influence of impulsivity and related personality traits, and certain co-morbid psychiatric disorders (Antisocial Personality Disorders and Substance Use Disorders have the strongest support). In addition the presence of mental health co-morbidity such as PTSD, past childhood trauma and sorrow was observed in the qualitative data. The presence of negative affect including stress, conflict, emotional highs and lows, boredom and the need for escape from these, posed considerable risks in the relapse to addictive behaviours in the majority of the qualitative studies reviewed.

Gambling expectancies (especially expectancies of winning) and gambling availability contributed to frequency and intensity of gambling behaviour. Although these factors have not been directly studied in gambling relapse, they are likely to be promising candidates for future research into gambling relapse predictors. Environmental triggers that enticed people to engage in addictive behaviours were also highlighted as important in the qualitative studies.

There is weak and inconsistent support for sensation-seeking and reward dependence as related to gambling behaviours and other predictors. Qualitative studies have not recognised these as important issues.

The qualitative studies all provided data on common protective factors that reduce the risk of relapse. These included the use of coping strategies, self-efficacy and self-esteem, existential issues such as involvement, quality of life, spirituality and the belief in a higher power, the availability of affective and social support and the acquisition of relapse prevention skills and knowledge about the drug or addictive behaviour.

# 4   . MODELS OF RELAPSE

## 4.1    Transition to dynamic models

The majority of research into relapse over the past 20 years, with the notable exception of the original model (Marlatt and Gordon, 1985), has concentrated on theories and models of limited scope (Brandon et al., 2007). The majority of constructs reviewed in section 3.1 have been investigated in relative isolation. Even Marlatt has been criticised for not including more trait-like variables in his model (Loughnan et al., 1996). A number of theorists in addition to Marlatt, notably Shiffman (1989) and Niaura (2000), have increasingly theorised about the dynamic inter-relationships between relapse predictors, and moved the field toward a more integrated model. Witkiewitz and Marlatt (2004) have articulated what is arguably the most sophisticated model of relapse in the addictions to date, incorporating the ideas of Shiffman and Niaura. As this model is best seen as the culmination of collective thought it would be redundant to explain alternative models. Instead, this review focuses on Witkiewitz and Marlatt's revised model of relapse as representative of the latest developments in relapse theory in general. We will then discuss how this will still require adaptation to suitably guide policy and treatment development in gambling.

### 4.1.2    Witkiewitz and Marlatt's (2004) addictions relapse prevention model
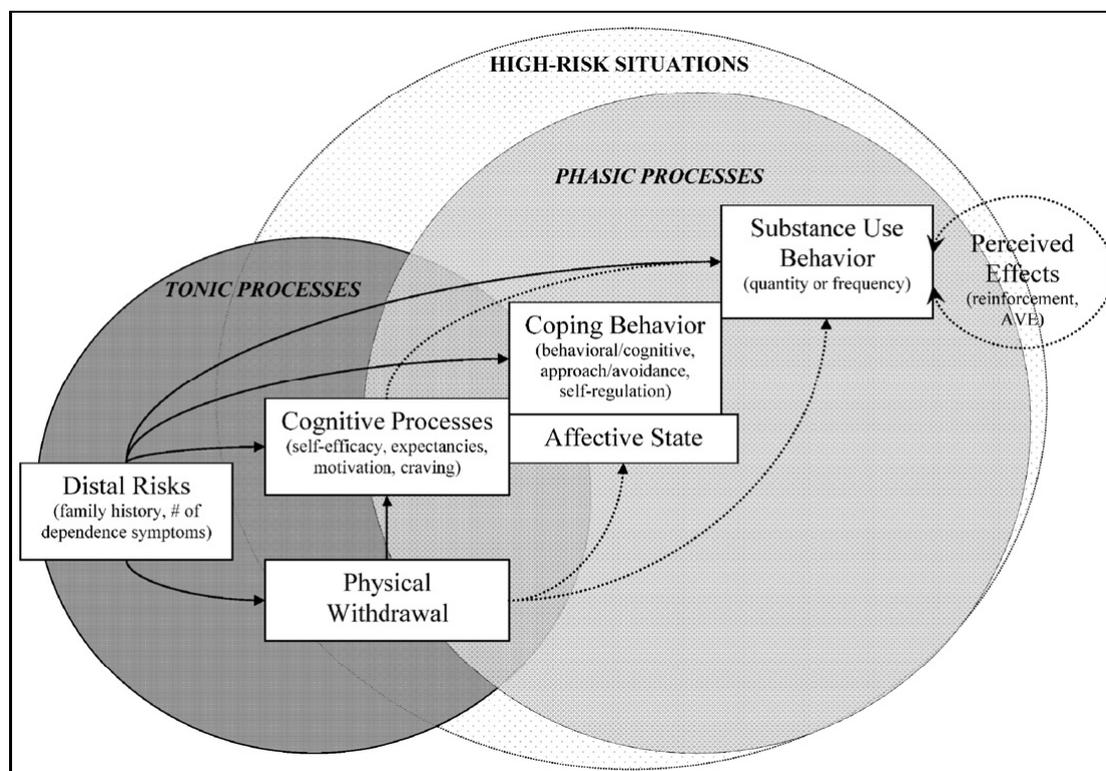


Figure 1. Witkiewitz and Marlatt's (2004) revised model of relapse in the addictions.

Witkiewitz and Marlatt's (2004) revised model of relapse in substance use addictions (note that physical withdrawal is a key component) is shown in Figure 1. It adopts the distinction first introduced by Shiffman (1989) between proximal and distal determinants of relapse, then refined and redefined by Barker et al. (2004) and Piasecki et al. (2002) between tonic and phasic determinants. Tonic determinants are relatively enduring, stable characteristics representing a chronic vulnerability to relapse, but distal determinants of specific episodes (lapses or relapses). Tonic processes tend to accumulate and increase the likelihood of high-risk situations. Phasic determinants are dynamic, proximal precipitants of specific episodes. Phasic determinants reciprocally influence one another to escalate or de-escalate the risk of relapse. They represent the potential "turning point" whereby a stable pattern of abstinence is threatened. The quality of the individual's coping response ultimately determines whether he/she returns to the formerly problematic behaviour, or strengthens his/her motivation and ability to remain abstinent.

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High-risk situations are the context in which phasic and tonic processes interact, and the context moderates the relationship between risk factors and problem behaviours. For example, for someone abstaining from gambling, driving past a hotel is potentially a high-risk situation if the hotel serves as a cue that elicits strong urges to gamble (tonic and phasic process), the individual has a long history of gambling at hotels (tonic processes), and the individual doubts their ability to resist the urge at that moment (low self-efficacy, phasic process). In this example, properties of the hotel may influence (moderate) whether the person engages in determined efforts to cope or not. These might include advertisements of drink specials, an empty car park for the gambler who dislikes crowds or a full car-park to the gambler who likes company, or the advertisement of jackpots.

Thus, this model has several key features, it: a) specifies temporal relations between predictor variables; b) emphasises the dynamic interaction between phasic processes, allowing for "feedback loops" (Niaura, 2000). It is therefore somewhat less directive, if not instructive, of the strength and direction of the relationships between phasic variables; and c) it implies that distal precipitants have both direct and indirect (mediated through phasic determinants) influence on problematic behaviour outcomes.

There are various studies and findings that have informed the development of the model. The distinction between tonic and phasic processes is demonstrated by differences in the predictive power of the same variable when measured in trait-like ways, prior to treatment or temporally distant from lapses, compared to measurement proximally to lapses. Shiffman and colleagues (2000) found the degree of phasic increases in urges were predictive of smoking relapse, but tonic smoking urge levels added no further predictive power beyond urge increases. Similarly, tonic self-efficacy predicted lapses but not relapse, whereas phasic self-efficacy predicted relapse in smokers (Shiffman et al., 2000). That distal factors influence relapse via mediating proximal processes has also been demonstrated. Litt et al. (2003) reported readiness to change prior to treatment did not directly predict drinking treatment outcomes, but influenced the use of coping strategies, which in turn predicted drinking outcomes. Similarly, negative affect following smoking cessation has been shown to influence future smoking via self-efficacy (Cinciripini et al., 2003) and outcome expectancies (Cohen et al., 2002), but not directly.

The importance of dynamic processes in relapse is underscored by the strong associations between acute changes in predictor variables and problematic behaviour. Thus, a decline in momentary motivation was shown to predict smoking relapse (Hedeker and Mermelstein, 1996). Negative affect on days prior to a smoking lapse have been found not to predict lapses, but a steady rise in negative affect during the 6 hours before a lapse was predictive of smoking (Shiffman and Waters, 2004). Dynamic processes also appear important over longer periods. For instance, adolescent substance use appears to oscillate between periods of more and less substance use, levelling out to a more stable pattern over time (Boker and Graham, 1998). Drinking patterns have been reported to cycle periodically over 6 years (Hawkins and Hawkins, 1998). Furthermore, there have been increasing reports that non-linear statistical models fit substance use patterns more accurately than linear models (Hufford et al., 2003; Warren et al., 2003).

### 4.1.3    Adapting Witkiewitz and Marlatts model for gambling

While Witkiewitz and Marlatt (2004) provide a useful framework for integrating the disparate research findings relevant to gambling relapse, some further amendments may be required. First, while some authors report a psychological withdrawal syndrome from pathological gambling (Rosenthal and Lesieur, 1992; Toce-Gerstein et al., 2003), it is not clear whether this is comparable to the physical withdrawal symptoms evident in drug and alcohol dependence. This component of Marlatt's model may not be relevant for our purposes. Psychological withdrawal may be adequately captured by more proximal variables such as affective states, self-efficacy and expectancies.

Secondly, Marlatt's model remains very much an individualistic model. While contextual influences are accommodated somewhat through high-risk situations, it may be more useful at a public health level to consider broader social-environmental factors, which may influence both the development of individual tonic processes and the frequency and intensity of high-risk situations.

Figure 2 outlines an adapted version of the Witkiewitz-Marlatt model. It places the relevant risk factors reviewed in section 3.1 in appropriate relationship with one another. Note that environmental variables are accommodated in the rectangle that encompasses the individual tonic and phasic processes, and the context of high risk situations.
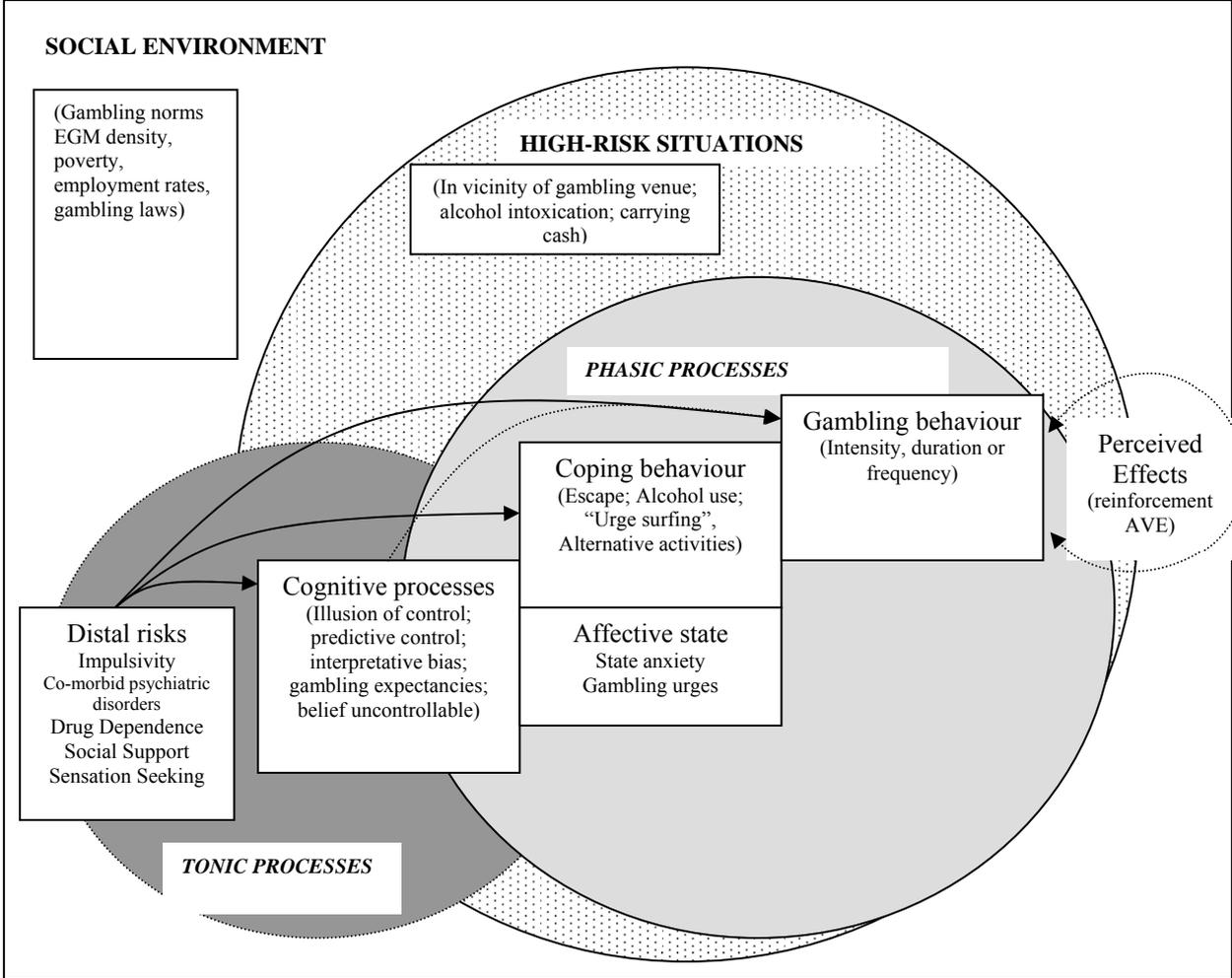


Figure 2. Flinders model of gambling relapse adapted from Witkiewitz and Marlatt (2004).

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# APPENDIX 1: SEARCH STRATEGY

Searches were performed in the following electronic databases:
PsycInfo
Medline
CINAHL
SCOPUS
Health Business fullTEXT Elite
Psychology & Behavioral Sciences Collection
Web of Science
Google Scholar
Embase

Thesaurus terms were also utilised where appropriate, as well as free text searching. Terminology was adapted for different databases. Below is a list of terms employed.

Substance-related disorders – included the following:

Alcohol-Related Disorders
Alcohol-Induced Disorders +
Alcoholic Intoxication
Alcoholism
Amphetamine-Related Disorders
Cocaine-Related Disorders
Marijuana Abuse
Opioid-Related Disorders
Heroin Dependence
Morphine Dependence
Substance Abuse, Intravenous
Tobacco Use Disorder

Drug usage:

     Alcohol drinking patterns
     Drug abuse
     Intravenous drug abuse
     Binge drinking
     Polydrug abuse

Gambling:

     Pathological gambling
     Gambler(s)
     Recurrence
     Lapse
     Relapse(s)
     Relapsing

Other terms:

     Relapse prevention
     Prognosis
     Abstain (ing)
     Abstinence
     Qualitative studies
     Qualitative research

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Qualitative
Grounded theory
Grounded
Focus group(s)
Structured interview
Treatment
Environment
Urges
Craving
Cues
Social
Peer
Co-morbidity
Depression
Grief
Financial
Religion
Spirituality
Gamblers Anonymous
Reinforcers
Theory
Conditioning
Genetic
Treatment
Negative affect
Stress
Post traumatic stress disorder
Parkinson's Disease
Cognitions
Erroneous beliefs
Outcome expectancies
Disability
Disability
Personality traits
Impulsivity
Sensation seeking
Reward dependence
Extraversion
Personality disorder
Psychological arousal
Emotional states
Gambling venues
Gambling availability

## Alcohol and substance use qualitative studies

relaps* as a word (truncated for relapsed, relapse, relapsing) and included Recurrence
Keywords: focus groups, interview, qualitative, and grounded theory. Plus the subject heading Qualitative research. The three sets of concepts were added together. The limits of ten years and English language only were applied.

1. (MH "Substance-related disorders+")
2. (MH "Recurrence")
3. Relaps*
4. 2 or 3

5. (MH "Focus group")
6. structured interview
7. grounded theory
8. qualitative
9. (MH "Qualitative research")
10. 5 or 6 or 7 or 8 or 9
11. 1 AND 4 AND 10
12. limit English language items
13. limit year 1998–2008


## Gambling relapse

Keyword search for gambling and relapse (using gambl* and relaps* to cover variations), not qualitative and qualitative in the following databases:
PsycInfo
Medline Full Text
CINAHL Plus Full Text
Health Business Elite
Psychology & Behavioral Sciences Collection
Google Scholar
Web of Science
SCOPUS

FLINDERS UNIVERSITY
ADELAIDE | AUSTRALIA

Flinders Human Behaviour and Health Research Unit

# DEFINITION AND PREDICTORS OF RELAPSE IN PROBLEM GAMBLING

# DELPHI STUDY

Commissioned by

Gambling Research Australia (GRA)

**February 2008**

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## EXECUTIVE SUMMARY

### Background

There is a paucity of research into the predictors of relapse. Also there are no clear definitions of gambling lapse and gambling relapse. Understanding the process of relapse into problem gambling and other addictive disorders will help improve treatment retention, improve treatment outcomes and help predict those who are vulnerable to relapse. This study aimed to measure the degree of consensus on elements, definitions, and predictors of relapse in problem gambling among national and international experts in gambling and related disorders. Results from a systematic literature review and focus group exploring predictors of relapse in problem gambling and related disorders were used to guide the Delphi process. Subsequently, results of the Delphi study contributed to the design of a 12 month observational study.

### Method

The Delphi is an iterative process in which individuals are provided the opportunity to change their opinions based on feedback of summary measures from preceding rounds. Advantages of the Delphi method include its ability to structure and organise group communication; diversity of applications and modifications for business, industry and health care research; and engagement of participants geographically separated by mail or online.

This Delphi study comprised four rounds with degree of consensus assessed by calculating the semi-inter-quartile range for each element and predictor of relapse:

- Round One: A project advisory group comprising of national and international experts in problem gambling and drug and alcohol addictions attended a one-day workshop. Tasks included creating definitions of lapse and relapse in problem gambling and listing all potential elements and predictors of relapse. A list of experts was also generated for participation in subsequent rounds.
- Round Two: The entire list of elements and predictors and alternative definitions of relapse were sent to participants for rating.
- Round Three: A response rate of 46% from round two was achieved with twenty two participants returning completed questionnaires. This round consisted of a revised questionnaire based on results from the preceding round including median scores for each item. Participants were then asked to once again rate each item in light of the new information.
- Round Four: The chief investigator convened a meeting of an expert panel of international researchers who attended the Auckland 2008 International Think Tank on Gambling at the Auckland University of Technology.

### Results

Main results included:

- It was agreed at the outset that whilst a global definition of relapse could be established, relapse consisted of a process that occurred in a number of domains and elements within each domain.
- All elements and predictors of relapse were ranked according to degree of consensus achieved in rounds two and three. A degree of consensus for alternative definitions of lapse and relapse was achieved.

- The expert panel convened at the Auckland Think Tank on gambling in Feb 2008 reached consensus that definitions of lapse and relapse should be able to be quantified.
- There were alternative definitions provided for each of lapse and relapse and controlled or abstinent gambling. For each of these categories, three alternative definitions provided the option of including the concept of causing significant "harm to the individual, significant others or the community" or "an ongoing or prolonged loss of control". The three options were harm, loss of control or a combined harm and loss of control.
- The expert panel of researchers reviewed the rated elements and predictors of relapse. There was general agreement that the range of elements and potential predictors covered a broad range of biological, psychological and social factors. No additional elements were added or removed as a result of the discussion.
- The expert panel, while supporting the provided definitions, noted that concepts of "harm" and "loss of control" were subject to wide interpretation and were not measurable. Consensus was achieved to describe a lapse as a single episode of gambling beyond abstinence or controlled gambling and relapse as more than one episode of gambling beyond abstinence or controlled gambling.

Consensus results for the elements and predictors of relapse guided selection of the following validated measurement scales for a 12-month prospective observational study:

Outcome variable

- Victorian Gambling Screen (VGS).

Predictor variables

- Arnett Inventory of Sensation Seeking (AISS)
- Spielberger Trait Anxiety Inventory (STAI)
- Depression Anxiety Stress Scale (DASS21)
- Gambling Related Cognition Scale (GRCS)
- Multidimensional Scale of Perceived Social Support (MSPSS)
- Alcohol Use Disorders Identification Test (AUDIT)
- Work and Social Adjustment Scale (WSAS)
- Gambling Urge Scale (GUS).

The definitional quantification of relapse by the expert panel made it possible to include this as an alternative outcome measure of relapse in the observational study.

# DEFINITION AND PREDICTORS OF RELAPSE IN PROBLEM GAMBLING: A DELPHI STUDY

## 1. INTRODUCTION

Problem or pathological gambling from a mental health perspective is defined by the American Psychiatric Association DSM-IV as "persistent and recurrent maladaptive gambling behaviour that disrupts personal, family and vocational pursuits." A prevalence study in the United States and Canada estimated 1-2% of the adult population met the diagnostic criteria for pathological gambling (Shaffer and Hall, 2001). Similar prevalence rates exist for Australia and New Zealand (Delfabbro, 2007).

There is a lack of theoretical understanding regarding the aetiology and treatment of problem gambling, which has a significant impact on the establishment of effective evidence-based treatment programs. The measurement of gambling related problems is an ongoing challenge with a lack of consistent definitions of abstinence and controlled gambling. There are also no clear definitions of gambling lapse and gambling relapse. Problem gambling is proposed to have a similar aetiology to other addiction models, including alcohol. Understanding the process of relapse into problem gambling and other addictive disorders will help improve treatment retention, improve treatment outcomes and help predict those who are vulnerable to relapse.

A project titled "Predictors of Relapse in Problem Gambling", funded by Gambling Research Australia, has utilised a variety of research methods to identify key processes of relapse including a literature review, focus groups and a Delphi study. Results from these investigations have informed the study design of a 12-month observational study with approximately 150 to 200 treatment-seeking problem gamblers in South Australia to commence late February 2008. This paper presents key Delphi findings and subsequent selection of psychometric rating scales for the observational study.

### 1.1 The Delphi Process

Delphi method takes its name from the Delphi oracles' skills of interpretation and foresight and proceeds in a series of rounds. Using an iterative process individuals are provided the opportunity to change their opinions based on feedback of summary measures from preceding rounds (Mullen, 2003). Advantages of the Delphi method include its ability to structure and organise group communication (Powell, 2003); diversity of applications and modifications for business, industry and health care research (Addington et al., 2005); and engagement by mail or online of participants who are geographically separated (Hasson et al., 2000). Examples of Delphi studies in health research include: characterising relapse in schizophrenia (Burns et al., 2000); describing service models of community mental health practice (Fiander and Burns, 2000); and identifying performance measures for treatment services of psychosis (Addington et al., 2005). With the study of relapse processes in problem gambling in a nascent stage the Delphi would be useful to identify and measure uncertainty.

The panel of experts for a Delphi study does not require a statistically representative sample. The panel is assessed on qualities such as degree of expertise of individuals rather than the overall number (Powell, 2003). A panel comprising 25 experts with relatively homogenous characteristics is considered methodologically sound (Delbecq et al., 1975). Delbecq states that homogenous groups beyond 30 have limited new ideas generated, so that a group of 10 to 15 should be sufficient. Determination of panel size is based on the purpose of the investigation; small panel sizes for Delphis should not be confused with conventional survey designs (Mullen, 2003). The response rate for a study can vary from 8 to 100 percent, with

larger panels having a higher drop-out rate. Panels with approximately 20 members tend to demonstrate stability from one round to the next (Mullen, 2003).

## 2. METHODS

The Delphi process was administered by a non-clinical researcher.

### 2.1 Round One

A project advisory group comprising national and international experts in problem gambling and drug and alcohol addictions attended a one-day workshop. Prior to the workshop members were provided with a summary of a literature review investigating relapse processes and predictors of relapse in problem gambling (Appendix 1). The advisory group was facilitated by a "non-expert" in problem gambling using key findings from the literature as a guide to ensure full coverage of the topic.

The advisory group agreed to the following global definition of relapse:

*Relapse is the re-emergence of gambling that may cause harm to the individual, significant others or the community after a period of abstinence or controlled gambling,*

but concluded that relapse consisted of a process that occurred in a number of domains and elements within each domain. The following alternative definitions of "lapse" in problem gambling were also developed using the conditions of abstinence and controlled gambling:

Definitions for lapse where abstinence had been the goal:

*Lapse is a single gambling episode after a period of abstinence that does not cause harm to the individual significant others or the community.*

*Lapse is a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode.*

*Lapse is a single gambling episode after a period of abstinence that does not involve prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.*

Definitions for lapse where controlled gambling had been the goal:

*Lapse is a re-occurrence of a gambling episode (or pattern of gambling) that does not cause harm to the individual, significant others or the community after a period of controlled gambling and is not the start of a relapse.*

*Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not cause harm the individual, significant others or the community.*

*Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve an ongoing or prolonged loss of control beyond the episode.*

*Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve a prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.*

The task for the advisory group then became the creation of a list of elements and predictors of relapse in problem gambling using a brainstorming process to elicit a wide range of suggestions. Elements of relapse were listed using the domains "cognitive", "behavioural" and "interpersonal" factors. Domains for predictors of relapse included: "psychological", "psychobiological", "social and environmental", and "treatment" factors with elements further categorised as either proximal or distal events. Members of the group also selected suitable experts to participate in round two for rating agreement with elements and predictors of relapse, and definitions of lapse. A total of 48 experts were nominated, with an expected response rate between 30 to 50 percent.

Group discussion was facilitated with feedback of results from a focus group conducted prior to the workshop. The focus group comprised eleven clinicians with experience in problem gambling and post-graduate qualifications in mental health sciences. Participants explored processes of relapse in problem gambling and other addictions. Information from this group provided the opportunity for comparisons and contrasts with emerging themes in the Delphi process.

## 2.2 Round two

The entire list of elements and predictors of relapse, and alternative definitions of lapse were emailed to the nominated experts (Appendix 2). Participants were asked to rate their agreement with each statement using the scale: 1 = essential; 2 = very important; 3 = important; 4 = less important; 5 = unimportant. The opportunity was also provided for additional elements and predictors, and comments about the definitions of lapse. Anonymity between participants was maintained in this and subsequent rounds.

## 2.3 Round three

A response rate of 46% from round two was achieved with twenty-two participants returning completed questionnaires. This round consisted of a revised questionnaire (Appendix 3) based on results from the preceding round including median scores for each item. Participants were asked to rate the elements and predictors in light of the new information and to provide comments if a rating was more than two points from the median. Participants were offered US$200 to compensate for their time in contributing to all three rounds of the process.

## 2.4. Round four

The chief investigator (MB) convened a meeting of an expert panel of international researchers who were attending the Auckland 2008 International Think Tank on Gambling, convened by the Auckland University of Technology annually for the previous 4 years. This group was asked to review and verify or comment on the findings of the previous three rounds of the Delphi process, which had resulted in ratings and comments about the proposed definitions of relapse and lapse and a table showing a prioritised list of elements and potential predictors.

## 2.5 Statistical methodology

For each element and predictor of relapse a median score was calculated using participant ratings in the Delphi process. Median scores determined the overall classification of elements and predictors as either essential = 1, very important = 2, important = 3, less important = 4, or unimportant = 5 at the completion of round three and were presented in the final results.

Degree of consensus achieved was assessed by calculating the semi-inter-quartile range (Jenkins and Smith, 1994, Jones and Hunter, 1995) for each element and predictor of relapse.

The inter-quartile range comprises 50 % of the scores between the 25th and 75th percentile. Absolute values of 0.5 or less were interpreted as strong group consensus. For example, a median score equal to 3 (important) and a consensus value of 0.5 indicates 50 % of participant ratings are between 2.5 and 3.5. Smaller values of semi-inter-quartile range indicate stronger degree of consensus.

## 3. RESULTS

### 3.1 Consensus

The spread of responses in the third round, analysed by semi-inter-quartile range, are provided for the elements (Tables 1-3) and predictors (Tables 5-7) of relapse. In round three, strong consensus was indicated for 16 (88.9%) of the elements of relapse and 62 items (93.9%) for predictors of relapse.

Suggestions of further elements and predictors of relapse from participants in round two were distributed in round three for rating by the group. Results (Tables 8 and 9) indicate for 6 (85.7%) of the elements of relapse and all the predictors achieved strong group consensus.

The spread of ratings for the alternative definitions of "lapse" in problem gambling are shown as percentages (Table 4) for rounds two and three.

Table 1. Elements of relapse judged essential (median score 1).

| Element | Semi-inter-quartile* range |
| --- | --- |
| **Behavioural** | |
| *My urge has returned and I can't control it* | 0.5 |
| **Interpersonal** | |
| *Gambling is affecting my work and social behaviour* | |
| *(e.g. Leaving work early to gamble …gambling during breaks)* | 0.5 |

*Values of 0.5 or less indicate strong group consensus

Table 2. Elements of relapse judged very important (median score 2).

| Element | Semi-inter-quartile* range |
| --- | --- |
| **Cognitive** | |
| *I believe that gambling is an option to solve a problem* | 0.5 |
| *I'm thinking about gambling more than before* | |
| *(pre-occupation with gambling)* | 0.5 |
| *I am gambling again, I'm thinking about gambling* | |
| *and I feel like I want to gamble again* | 0.5 |
| **Behavioural** | |
| *I tell lies to myself and others about my gambling* | 0.5 |
| *I'm gambling more than I think I should* | 0.5 |
| *I have reduced alternative leisure activities to gambling activities* | 0.125 |
| *I have disengaged from non-gambling activities* | 0.5 |
| **Interpersonal** | |
| *I have been emotionally or physically absent with significant* | |
| *others as a result of a pre-occupation with gambling* | 0.5 |
| *I have withdrawn from supportive social networks* | 0.5 |
| *I am experiencing personal conflict about or related to my gambling* | 0.125 |

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Table 3. Elements of relapse judged important (median score 3).

| Element | Semi-inter-quartile* range |
|---|---|
| **Cognitive** | |
| *I'm concerned about losing control and gambling again the way I used to do* | 0.5 |
| *I'm thinking about ways to get money* | 0.5 |
| *I tell lies to myself* | 1 |
| **Behavioural** | |
| *I have not told others about my worries about relapse* | 0.125 |
| **Interpersonal** | |
| *I am seeing old friends related to previous gambling culture* | 0.5 |
| *I am suspected of gambling and have been challenged about this by significant other/s* | 1 |

*Values of 0.5 or less indicate strong group consensus

Table 4. Definitions of Lapse.

| Definition | Percent of ratings for round 3 (round 2 percent below) | | |
|---|---|---|---|
| | **Least ap'riate** | **appropriate** | **Most ap'riate** |
| **Definitions for lapse where abstinence had been the goal.** | | | |
| 1. *Lapse is a single gambling episode after a period of abstinence that does not cause harm to the individual, significant others or the community.* | 5% (5%) | 28% (36%) | 67% (59%) |
| 2. *Lapse is a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode.* | 39% (36%) | 50% (55%) | 11% (9%) |
| 3 *Lapse is a single gambling episode after a period of abstinence that does not involve prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.* | 56% (41%) | 39% (45%) | 5% (14%) |
| **Definitions for lapse where controlled gambling had been the goal.** | | | |
| 1. *Lapse is a re-occurrence of a gambling episode (or pattern of gambling) that does not cause harm to the individual, significant others or the community after a period of controlled gambling and is not the start of a relapse.* | 29% (40%) | 30% (15%) | 41% (45%) |
| 2. *Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not cause harm to the individual, significant others or the community.* | 6% (16%) | 44% (63%) | 50% (21%) |
| 3. *Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve an ongoing or prolonged loss of control beyond the episode.* | 35% (38%) | 47% (57%) | 18% (5%) |
| 4. *Lapse is a pattern of increased gambling behaviour after a* | 47% | 35% | 18% |

*period of controlled gambling that does not involve a prolonged* (40%)      (40%)      (20%)
*loss of control beyond the episode nor cause harm to*
*the individual, significant others or the community.*

Table 5.
Predictors of relapse judged very important (median score 2).

| Predictor | Semi-inter-quartile range* |
|---|---|
| **Psychological** | |
| **Distal**\*\*- | |
| *Impulsivity* | 0.125 |
| | |
| **Psychobiological** | |
| **distal-** | |
| *Affective disorder, anxiety disorder and substance use* | 0.5 |
| *Lack of frontal lobe disinhibition* | 0.5 |
| **proximal**\*\*\*- | |
| *Negative affective state* | 0 |
| *Stress reactivity* | 0.5 |
| *Affective instability* | 0.5 |
| *Intoxication with drugs or other substances* | 0.5 |
| | |
| **Social and Environmental** | |
| **Distal-** | |
| *Access to money* | 0.5 |
| *Number, proximity and types of gambling venues (opportunities to gamble)* | 0.5 |
| **Proximal-** | |
| *High risk situations* | 0 |
| *Access to money* | 0.5 |
| *Specific learnt cues* | 0.5 |
| *Lack of access to supportive social support networks* | 0.5 |
| *Lack of involvement with supportive social networks* | 0.5 |
| | |
| **Treatments** | |
| **distal-** | |
| *Co-morbidities identified* | 0 |
| *CBT-cue exposure +/- response prevention* | 0.5 |
| *Stage of treatment achieved* | 0.5 |
| *Voluntary help seeking v/s other motivating factors* | 0.5 |
| *Avoidance strategy v/s mastering urge* | 0.5 |
| *Previous episodes of relapse* | 0.5 |
| *Time since completing a treatment episode* | 0.5 |
| *CBT-avoidance and distraction focused* | 0.5 |
| **proximal-** | |
| *Co-morbidities addressed* | 0.125 |
| *Motivation* | 0.5 |
| *Treatment dose – homework done (hours)* | 0.5 |
| *Relationship with treatment provider/therapist* | 0.5 |
| *Stages of change (treatment readiness)* | 0.5 |

*Values of 0.5 or less indicate strong group consensus, ** distal indicates factors that are underlying, innate or long term, *** proximal indicates immediate or current factors

Table 6. Predictors of relapse judged important (median score 3).

| Predictor | Semi-inter-quartile range* |
|---|---|

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**Psychological**
**distal-**

| | |
|---|---|
| *Anxiety traits* | 0.25 |
| *Peer and family norms* | 0.25 |
| *Locus of control* | 0.5 |
| *Neuroticism, psychoticism* | 0.5 |

| | |
|---|---|
| ***Sensation seeking*** | **0.5** |

| | |
|---|---|
| ***Avoidant coping styles*** | **0.75** |

**proximal-**

| | |
|---|---|
| *Response to social and cultural cues (internal and external)* | 0.125 |
| *Major cultural/social events (triggers)* | 0.125 |
| *Anxiety states* | 0.5 |
| *Change in coping capacity* | 0.5 |
| *Peer pressure* | 0.5 |
| *Recurrence of cognition (erroneous)* | 0.5 |
| *Positive affective state* | 0.5 |
| *Grief and loss* | 0.5 |
| *Angry with self / angry with others* | 0.5 |
| *Social isolation* | 0.625 |

**Psychobiological**
**distal-**

| | |
|---|---|
| *Personality disorders* | 0.5 |
| *Pre-existing mental Illness* | 0.5 |

**proximal-**

| | |
|---|---|
| *Internal cues leading to physiological changes* | 0 |
| *Environmental cues leading to physiological changes* | 0.5 |
| *Environmental cues leading to changes in expectations* | 0.5 |

**Social and Environmental**
**distal-**

| | |
|---|---|
| *Role models* | 0.5 |
| *Advertising inducements* | 0.5 |
| *Gambling culture* | 0.5 |

**proximal-**

| | |
|---|---|
| *Inducements* | 0.5 |

**Treatments**
**distal-**

| | |
|---|---|
| *Episodes of treatment (number)* | 0.5 |
| *Inpatient treatment episodes (individual help)* | 0.5 |
| *Self-exclusion from venues* | 0.5 |
| *General counselling* | 0.75 |
| *Other* | 0.75 |

**proximal-**

| | |
|---|---|
| *External motivator / coercion by others rather than personal decision* | 0.25 |

*Values of 0.5 or less indicate strong group consensus.

Table 7. Predictors of relapse judged less important (median score 4).

| Predictor | Semi-inter-quartile range* |
|---|---|
| **Psychological** | |
| **distal-** | |
| *Extraversion & introversion* | 0 |
| | |
| **Psychobiological** | |
| **distal-** | |
| *Developmental disorder* | 0.5 |
| *Intellectual disability* | 0.5 |
| **proximal-** | |
| *Medication such as Zolpidem (Stilnox) causing dissociative states* | 0 |
| | |
| **Social and Environmental** | |
| **distal-** | |
| *Ethnicity* | 0 |
| **proximal-** | |
| *Advertising* | 0.375 |
| *Socio-economic status* | 0.5 |

*Values of 0.5 or less indicate strong group consensus.

Table 8. Additional elements of relapse proposed by participants in round 2, rated in round 3.

| Element | Semi-inter-quartile* range |
|---|---|
| **Rated "very important" (median score = 2)** | |
| *Frequenting places associated with past gambling* | 0.5 |
| *Spending increased time in which gambling takes place- some may be gambling/game specific (e.g., sports wagering,* | |
| *Internet wagering, poker playing)* | 0.5 |
| *I am committing crimes to recover debt or to finance more gambling* | 0.5 |
| | |
| **Rated "important" (median score = 3)** | |
| *I get into arguments with my spouse in order to have an excuse* | |
| *to go gamble* | 0.5 |
| *Boredom* | 0.5 |
| *Emotional upsets of any cause* | 0.5 |
| *Engaging in the behaviour at the same levels - at least temporarily –* | |
| *before gambling stopped* | 0.625 |

*Values of 0.5 or less indicate strong group consensus.

Table 9. Additional predictors of relapse proposed by participants in round 2, rated in round 3.

| Element | Semi-inter-quartile* range |
|---|---|
| **Rated "very important" (median score = 2)** | |
| *The desire to see if they are capable of gambling in a* | |
| *controlled fashion after a significant period of abstinence* | 0.5 |
| *Significant increase in gambling opportunities/venues* | 0.5 |
| *Spousal/marital/familial discord* | 0.5 |

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**Rated "important" (median score = 3)**

| | |
|---|---|
| *Extent to which the individual keeps problem secret from others.* | 0.25 |
| *Gamblers Anonymous (GA) attendance* | 0.5 |
| *Extent of "mind betting" (making wagers without placing a bet to* | |
| *see if the outcome can be predicted) or playing "free poker," or* | |
| *"free slots," etc. on the web or handheld device* | 0.5 |
| *Major traumatic life events* | 0.5 |

**Rated "less important" (median score = 4)**

| | |
|---|---|
| *Level of education in context of how well the client can incorporate* | |
| *what they have learned in treatment into their lives* | 0.5 |
| *Whether or not the client has children* | 0.5 |
| *Genetic predisposition* | 0.5 |

*Values of 0.5 or less indicate strong group consensus.

## 3.2 Measurement scale selection

Results from the Delphi study guided the selection process of self-report psychometric rating scales for a prospective observational study. The project team selected validated scales with the goal to minimise total number of study questions while simultaneously maximising potential for eliciting high quality data from study participants. Measurement scales were selected for (1) an outcome measure of relapse utilising the elements of relapse, and (2) predictors of relapse.

(1) Elements of relapse with median scores of "essential" and "very important", and having achieved strong group consensus (semi-inter-quartile range of 0.5 or less), were the primary items used for guiding measurement scale selection (Table 10). Final selection of the Victorian Gambling Screen[*] was based on the scales' following properties: (i) items on the self-harm subscale relate to the person's experiences in the previous 4 weeks and therefore enhance sensitivity to relapse and temporal associations, (ii) representation of all domains of elements in the final list (behavioural, cognitive, and interpersonal factors), and (iii) a validated cut-off point indicative of problem gambling. Of other validated instruments which classify problem or pathological gambling, neither the Canadian Problem Gambling Index (CPGI) nor the South Oakes Gambling Screen (SOGS) satisfied criteria (i) and (ii). The VGS is a self-reported questionnaire measuring the extent to which gambling behaviour has impeded the client's life. The harm to self sub-scale scores range from 0 = no harm to self to 60 = high harm to self. Concurrent validity indicates the scale correlates very highly with the SOGS (R = 0.97), but extends the score range (Ben-Tovim et al., 2001).

(2) As no predictors of relapse achieved a median value of "essential", scores of "very important" and "important", and strong group consensus (semi-inter-quartile range of 0.5 or less), guided measurement scale selection for the predictor variables (Table 11). Selected predictors were assessed as measurable in terms of validated self-rating scale properties, and minimal overlap within domains of psychological, psychobiological, and social and environmental factors. The following paragraphs present a summary of selected measurement scales.

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[*] Please note: The Victorian Gambling Screen (VGS) was developed by a team of researchers and clinicians at Flinders University led by Professor David Ben-Tovim after a competitive tender funded by the Victorian Casino and Gaming Authority. Professor Battersby was part of this team. There may be a perception of potential conflict of interest in the use of the VGS, although the VGS is the property of the Victorian government and is in the public domain. Hence, care was taken in the selection of the VGS on purely scientific grounds and in consultation with the entire research team.

*Depression and anxiety.* The Depression Anxiety and Stress Scale (DASS-21) is a 21 item self-report questionnaire that measures the experience of depression, anxiety or stress, for example "I couldn't seem to experience any positive feeling at all". The client is required to rate the degree to which the statements applied to them during the past week on a 1-4 scale ("not at all" to "most of the time"). Final scores indicate levels of depression (0-9 = normal, 28+ = extremely severe), stress (0-7 = normal, 20+ extremely severe) and anxiety (0-14 = normal, 34+ = extremely severe). Normal data has been collected for Australian populations and the DASS has been validated against other depression and anxiety inventories (Lovibond and Lovibond, 1995).

*Trait anxiety.* The Trait Anxiety Inventory form Y-20 is a 20-item self-report measure designed to record level of trait anxiety. Studies have shown that the scale has good reliability, measured by test-retest coefficients, and sound validity (Spielberger et al., 1983). Clients are required to rate the frequency at which they experience certain emotional and cognitive states using a four-point scale (1 = almost never, 2 = sometimes, 3 = often, 4 = almost always). Items include statements such as "I feel rested" and "I am happy". The score from each question is summed to create a total ranging from 20-80.

*Urge.* The Gambling Urge Scale (GUS) is a self-report questionnaire measuring the extent of gambling urge. The scale consists of six items rated on a Likert (1-7) scale, including statements such as "I crave a gamble right now" and "All I want to do is gamble". A final score is generated as a total of the responses to items. Higher scores indicate greater urges to gamble. Research into concurrent, predictive and criterion-related validity of the GUS suggest the GUS is a valid and reliable instrument for assessing gambling urges among non-clinical or non-treatment seeking gamblers. Predictive validity of problem gambling has been shown using the GUS. The GUS can be used to differentiate between non-problem gamblers and problem gamblers (Raylu and Oei, 2004b).

*Cognitive.* The Gambling Related Cognition Scale (GRCS) is a 23-item self-report questionnaire that records common thoughts associated with problem gambling. Statements include "Praying helps me win" and "I will never be able to stop gambling". Clients use a seven-point Likert scale (1 = strongly disagree, 2 = moderately disagree, 3 = mildly disagree, 4 = neither agree nor disagree, 5 = mildly agree, 6 = moderately agree, 7 = strongly agree) to indicate how much they agree with each of the statements. The final score is created by adding the values gained from the items; a higher score reflects more gambling related cognitions. A comparison with the South Oakes Gambling screen indicated the scale has good psycho-metric properties in measuring gambling cognitions in a non-clinical sample (Raylu and Oei, 2004a).

*Alcohol use.* The Alcohol Use Disorders Identification Test (AUDIT): Self Report Version is a non-diagnostic ten-item questionnaire indicating hazardous alcohol use. Individuals are required to rate how frequently they engage in certain activities on a scale of 1-5. Questions 1 to 3 measure quantity and frequency of alcohol use, questions 4 to 6 measure possible dependence on alcohol and questions 7 to 10 measure alcohol-related problems. Final scores range from 0 indicating abstainer, >8 indicating low risk alcohol use, 8+ indicating risky or harmful alcohol use, 13+ indicating alcohol dependence is likely. According to a recent review of studies reporting the psycho-metric properties of the AUDIT, the scale reveals specifics and sensitivities superior to those of other self-report screening measures and good test-retest reliability and internal consistency (Reinert and Allen, 2002).

*Sensation seeking traits.* The Arnett Inventory of Sensation Seeking (AISS) is a 20 item self-report questionnaire that measures sensation seeking personality trait. Within the tool there are two subscales, intensity and novelty, consisting of 10 items each. The scale has been shown to be free from social desirability bias (Roth, 2003). Clients are required to respond to 20 statements such as "I can see how it would be interesting to marry someone from a foreign

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country" and "when I listen to music I like it to be loud" using a scale of A "describes me very well" through to D "does not describe me at all". The final score ranges from 20-80, with a higher score reflecting higher levels of sensation seeking.

*Social support.* The Multidimensional Scale of Perceived Social Support is a 12 item self-report questionnaire containing three sub-scales (significant other, family and friends). Questions include items such as "my family really tries to help me" and "there is a special person in my life who cares about my feelings". The client responds to twelve statements using a 0-7 scale ranging from "very strongly disagree" through to "very strongly agree". The final score for the total and each sub-scale is the average of relevant questions and ranges from 0-7. Research has shown the MSPSS is psychometrically sound, with good reliability, factorial validity, and adequate construct validity (Zimet et al., 1988).

*Functional ability.* The Work and Social Adjustment Scale is a self-report questionnaire used to measure patient's perspective of their functional ability/ impairment. The scale contains five items which explore the degree to which the client's gambling problem affects their ability to function in the following areas: work, home management, social leisure, private leisure and family and relationships. Each question is answered using a 1-7 Likert scale ("not at all" to "very severely"), with higher scores corresponding to a higher degree of severity. Research into the validity of the scale suggests that WSAS correlates closely with the severity of depression and obsessive-compulsive disorder symptoms at 0.76 and 0.61 and is sensitive to patient differences and change following treatment (Mundt et al., 2002).

Table 10. Final elements of relapse and selected rating scales.

| Element | Rating scale |
| --- | --- |
| **Behavioural** | |
| *My urge has returned and I can't control it* | Gambling Urge Scale (GUS) |
| *I tell lies to myself and others about my gambling* | Victorian Gambling Screen (VGS) |
| *I'm gambling more than I think I should* | VGS |
| *I have reduced alternative leisure activities to gambling activities* | Work and Social Adjustment Scale (WSAS) |
| *I have disengaged from non-gambling activities* | WSAS |
| **Cognitive** | |
| *I believe that gambling is an option to solve a problem* | Gambling Related Cognition Scale (GRCS) |
| *I'm thinking about gambling more than before (pre-occupation with gambling)* | VGS |
| *I am gambling again, I'm thinking about gambling and I feel like I want to gamble again* | GUS |
| **Interpersonal** | |
| *Gambling is affecting my work and social behaviour (e.g. Leaving work early to gamble…gambling during breaks)* | WSAS |
| *I have been emotionally or physically absent with significant others as a result of a pre-occupation with gambling* | WSAS |
| *I have withdrawn from supportive social networks* | WSAS |
| *I am experiencing personal conflict about or related to my gambling* | VGS, WSAS |

# 4. ROUND FOUR RESULTS

The expert panel was convened at the Auckland Think Tank on gambling in Feb 2008. Those present were Prof Battersby (chief investigator), Prof Alun Jackson, Prof Robert Ladouceur, Prof Max Abbott, and Prof Rachel Volberg. Two observers from Sweden were present and contributed to the discussion. Each participant had been sent the background summary of the literature review, purpose of the Delphi study, and the results of the previous rounds summarised in tables that listed the quantified results of those elements and predictors of relapse most strongly rated by semi-inter-quartile range broken into "essential", "very important" and "important". The meeting was conducted over 90 minutes.

Most of the discussion related to the definitions of relapse and lapse. It was noted that the alternative definitions of lapse and relapse were divided into two categories, based on whether the person intended to become a controlled or an abstinent gambler. There were alternative definitions provided for each of lapse and relapse and controlled or abstinent gambling. For each of these categories, three alternative definitions provided the option of including the concept of causing significant "harm to the individual, significant others or the community" or "an ongoing or prolonged loss of control". The three options were harm, loss of control or a combined harm and loss of control.

Table 11. Final predictors of relapse and selected rating scales.

| Predictor | Rating scale |
| --- | --- |
| **Psychological** | |
| **distal-** | |
| *Impulsivity* | Arnett Inventory of Sensation Seeking (AISS) |
| *Anxiety traits* | Spielberger Trait Anxiety Inventory (STAI) |
| *Sensation seeking* | AISS |
| **proximal** | |
| *Anxiety states* | Depression Anxiety Stress Scale (DASS) |
| *Recurrence of cognition (erroneous)* | Gambling Related Cognition Scale (GRCS) |
| | |
| **Psychobiological** | |
| **distal-** | |
| *Affective disorder, anxiety disorder and substance use* | DASS, STAI, Alcohol Use Disorders Identification Test (AUDIT) |
| **proximal-** | |
| *Negative affective state* | DASS |
| *Stress reactivity* | DASS |
| *Affective instability* | DASS |
| *Intoxication with drugs or other substances* | AUDIT |
| *Internal cues leading to physiological changes* | Gambling Urge Scale (GUS) |
| *Environmental cues leading to physiological changes* | GUS |
| | |
| **Social and Environmental** | |
| **proximal-** | |
| *Lack of access to supportive social support networks* | MSPSS |
| *Lack of involvement with supportive social networks* | Work and Social Adjustment Scale (WSAS) |

After discussion there was consensus that both of the terms "harm" and "loss of control" were subjective and open to wide variation and interpretation. This was especially a problem if the purpose of the project was to provide definitions that were acceptable, interpretable and able to be validated internationally. For these reasons consensus was reached that the definitions

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should be able to be quantified. Whilst there had been a degree of consensus in the ratings of the proposed definitions of lapse and relapse through the Delphi process, several of the respondents had commented on the subjective nature of terms like "harm" and "loss of control", and had proposed that a quantitative definition be developed. Thus the expert panel were not making suggestions inconsistent with the previous rounds of the Delphi process itself. Debate occurred around what or how many episodes of gambling constituted a lapse or relapse. Instead of trying to quantify the amount of money or time spent in an episode, in a lapse or relapse, the most pragmatic approach was to describe the critical aspect as being the episode itself.

A lapse was thus defined as a single episode of gambling after a period of abstinence; relapse was defined as more than a single episode of gambling after a period of abstinence. Similarly, for controlled gambling, a lapse consisted of a single episode of gambling over and above that defined by the client as controlled gambling and relapse more than one episode of gambling over and above that defined by the client as controlled gambling.

The group of researchers then reviewed the rated elements and predictors of relapse. There was general agreement that the range of elements and potential predictors covered a broad range of biological, psychological and social factors. No additional elements were added or removed as a result of the discussion.


## 5. DISCUSSION

Through a series of sequential Delphi processes, key academics and clinicians in the international gambling field have identified a set of definitions, elements and predictors of relapse. Based on these findings, a smaller group of researchers who met in New Zealand have provided an alternative quantitative definition of lapse and relapse of problem gambling. These definitions, whilst perhaps controversial because of their quantitative nature, will enable episodes of lapse and relapse to be defined and measured as part of the proposed observational study into predictors of relapse, which by its design is quantitative. By using other measures of lapse and relapse, these measures and their definitions will be able to be tested and validated.

Once the results of the observational study are known, the findings from the literature review, the Delphi process, the focus groups and the observational study will be combined to present an integrated model of relapse in problem gambling.

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# APPENDIX 1: PARTICIPANTS' WRITTEN RESPONSES

## ELEMENTS OF RELAPSE

### Round One

*"I am a behaviourist so I define relapse as actual gambling more than your personal goal (i.e., I endorse the definition you provided in the Introduction above). Most of these items describe either vulnerability factors or consequences of relapse so I was unsure how to rate them because I don't see them as "elements" of relapse. My rating reflects how much each item is a correlate of relapse. I was also unclear about the meaning of the urge item (iii) above- does inability to control an urge imply that the individual is gambling or just simply experiencing an urge than does not go away?"*

*"It is not so much add, but a number of the measures above are more about reinstatement of dependence as opposed to a relapse. I have some concern about this. I also think that some element of time of gambling should be used in something like this (e.g. with drinking I had drinking 18 drinks or more in three days or less). Now I would describe this as a relapse but such an episode would not result necessarily in a reinstatement of dependence, as I think implied in some of the questions above - I hope this makes sense. So, what am I saying - I do not think you should rely so heavily on symptoms of dependence (which can take considerable time to emerge) but on evidence of duration of excessive gambling behaviour. "*

### Round Two

*"Relapse is often dependant upon access/availability of money (or close monitoring/scrutiny by spouse/partner): in the absence of money, risk of relapse is reduced in the sense that it is potentially delayed but not eliminated. Therefore I raise the question as to whether or not an element of relapse is linked to access and opportunity."*

*"Not so much to do with lapse but in section 1 - I couldn't add these comments earlier - frequenting places associated with gambling may be very important in the early stages of change – e.g. first 6-12 months, but may be less of an issue as longer periods of abstinence/controlled gambling are achieved"*

## DEFINITION OF LAPSE

### Round One

*"The concept of causing harm is a difficult one - if I lose a small amount of money then this is a "harm" or if I feel distressed about my minor lapse then this is a harm. It is difficult to imagine that any gambling after a period of abstinence would be harm-free. Perhaps harm should be qualified with the word "significant"? I also have difficulty with the term "loss of control" and prefer "impaired control", which is less dichotomous.*
*"I actually have stopped using the term lapse and instead describe relapses as either minor (short and no significant consequences) or major (either longer or with significant consequences). I am not sure that the requirement of impairment of control is helpful beyond the behavioural description of the gambling."*

*"I think lapse should be reserved for those individuals who are wanting to stop gambling, not control their gambling."*

*"Loss of control is an important element of relapse that discriminates it from a lapse."*

*"(1) I have gambled, lost control, and want to get my money back; (2) I just gambled and won a lot of money. (3) I don't think my problems are as bad as they used to be. I think I can go back to gambling again."*

*"I believe a lapse could cause the individual financial harm."*

*"How does one define a 'single episode'?"*

*"seems good to me."*

*"The key thing about a lapse is that it is only done once and does not lead to a second episode of gambling despite all the negative consequences that the first episode might cause to the individual or those around them. I also think it involves an awareness on the gambler's part that this was a "one off" and that they have no desire to repeat the experience"*

*"I would consider a lapse to be a discrete period of gambling behaviour following a period of abstinence or a discrete period of unplanned gambling behaviour following a period of controlled gambling (presuming of course that the definition of controlled gambling includes gambling behaviour that is planned). I'm not sure that either an absence of ongoing loss of control or the degree of harm caused by a lapse are necessary in defining a lapse. I would consider that the degree to which a lapse has the potential to develop into a relapse is a function of the resources of the individual to manage the lapse. In this way, loss of control becomes more important in the definition as this will make it more difficult for the individual to prevent a single gambling episode from developing into relapse."*

*"It seems likely to me that lapses are common occurrences in recovery from problem gambling and that each discrete period of gambling is considered a lapse until the person returns to problematic levels of the behaviour (relapse). In this sense, I am defining relapse in terms of the degree to which the person meets the criteria of the behaviour in question (i.e., problem or pathological gambling as measured by screening instruments or diagnostic criteria, etc.)."*

*"As I said previously, the key thing about a lapse is that it is only done once and does not lead to a second episode of gambling despite all the negative consequences that the first episode might cause to the individual or those around them. I also think it involves an awareness on the gambler's part that this was a 'one off' and that they have no desire to repeat the experience"*

## Round Two

*"A lapse is a diffuse term that can refer to a resumption of gambling within a defined short term that may or may not be associated with harm or impaired control. An exemplar is a person who visits a venue with peers, participates in gambling but does not exceed disposable income or create harm. The objective is controlled gambling rather than abstinence. Alternatively, from a clinical perspective, a lapse may be taken to infer the presence of a loss of control or the creation of harm. An alternative to this alternative can be seen as founded in the abstinence model: here, any gambling independent of control or harm must be construed as a lapse. It appears that there is a matrix of factors that define a lapse and there are tied into theoretical and ideological frameworks."*

*"I believe that a lapse may cause harm to the individual or society, particularly if the lapse later becomes a relapse. In my understanding of the terms, an initial lapse may transition into a relapse if the individual loses control of their gambling. However, a lapse does not*

*necessarily have to become a relapse. That is, a lapse is necessary but not sufficient for relapse."*

*"I think 'single episode' is too restrictive. I think a lapse can occur more than a single episode. I don't think it is the frequency, but rather the intensity (time, money, preoccupation, chasing), that distinguishes a lapse from a relapse."*

## PREDICTORS OF RELAPSE

### Round One

*"... but I do want to stress my answers... depend to some extent on individual variation - treatment attendance is important, but more so for some and not others. "*

*"I'm not sure that any of these factors are 'essential' in predicting relapse as the likelihood of relapse is affected by the convergence of several factors that seem to be relatively heterogeneous across the problem gambling population."*

*"I think it is really important to focus on the interaction between both distal and proximal risks. For example, being unmotivated to change might not matter if the person is not in close proximity to gambling venues and has no friends who gamble; however even the highest "motivated" client could be triggered into a lapse by exposure to a favourite gambling venue or person he/she associates with good times while gambling."*

### Round Two

**"***There is conflicting empirical evidence to support the role of sensation seeking in gambling and less so for lapses/relapses.*
*"Grief and loss should be classified within the context of general stresses since there is minimal indications that grief and loss increase risk for relapses. I have no idea what changes in environmental cues leading to changes in expectations means. The stages of change model is a nice heuristic but its conceptual foundations can be criticised. I refer to Robert West's useful critique of the model in Addictions. There is a presumed linear and stable progression in the model that does not exist in reality. More research needs to be done on these changes in relation to relapse."*

*"I think far too much emphasis is put on stages of change, especially given some of the reasonable criticisms about the poor predictive utility of the construct. I also think it is being used inappropriately by many clinicians, a bit like in the past people used to say 'she's not ready yet' - it is the role of the skilful clinician to work effectively in these areas. Also, as for the other scores, I would like to add the rider - it varies by individual."*

*"If underlying causes of distress are not addressed therapeutically, relapse is more likely to occur."*

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# APPENDIX 2: LITERATURE REVIEW

The following summary presents key points from recent reviews and studies investigating relapse and predictors of relapse in problem gambling and related disorders. Research from other addiction models, such as substance abuse, is utilised as problem gambling is proposed to have a similar aetiology. A summary of research findings of predictors of relapse specific to gambling is provided in Table 1.

**Ledgerwood and Petry (2006)** provide a recent broad overview of relapse and precipitants of relapse in problem gambling:

- Inconsistencies in definition of relapse in problem gambling and other addictive disorders has limited the ability to compare studies and make conclusive arguments about the processes leading to relapse.
- Substance abuse research provides a framework for understanding relapse by differentiating between lapse and relapse. A lapse involves a transgression from treatment or program rules specific to the individual. Relapse is a perceived loss of control over the behaviour or an extended resurgence of the behaviour.
- Authors believe distinction between lapse and relapse is most useful definition for problem gambling. However, difficulties inherent in such a definition include subjective constructs such as "loss of control", which need further researching.
- Unanswered factors in present definitions of relapse in problem gambling include: Does relapse occur with any gambling or only at a certain threshold of gambling? How long must one maintain reduced gambling or abstinence before a relapse may occur? Can one engage in non-preferred forms of gambling without considering this a lapse or a relapse? Is controlled gambling a legitimate goal?
- Although from different perspectives the psychosocial (cognitive, affective, and situational precipitants) and psychobiological (cravings or urges and withdrawal symptoms) models of relapse have relevance to the study of relapse in PG.
- Potential relapse factors include: psychological (e.g. coping in high-risk situations, cognitive errors, personality), psychobiological (e.g. genetic influences, environmental cues and physiological responses), and social and environmental (e.g. number of gambling venues in gamblers environment, attitudes toward gambling and presence of gambling among significant others).

Methodological issues with relapse studies have recently emerged in the literature with particular emphasis on linear versus non-linear approaches **(Witkiewitz and Marlatt, 2007)**:

- Relapse is a complex process that cannot be readily explained by linear processes. For example, a minor cue such as an undetected reduction in self-efficacy may initiate a downward spiral of increased cravings and intensified negative affect resulting in a major relapse.
- Authors proposed a dynamic model of relapse processes (2004) as shown in Figure 1.
- Past research has relied on linear methods in predicting relapse with unsuccessful results. Authors propose non-linear dynamical systems theory, specifically catastrophe modelling for predicting relapse processes.
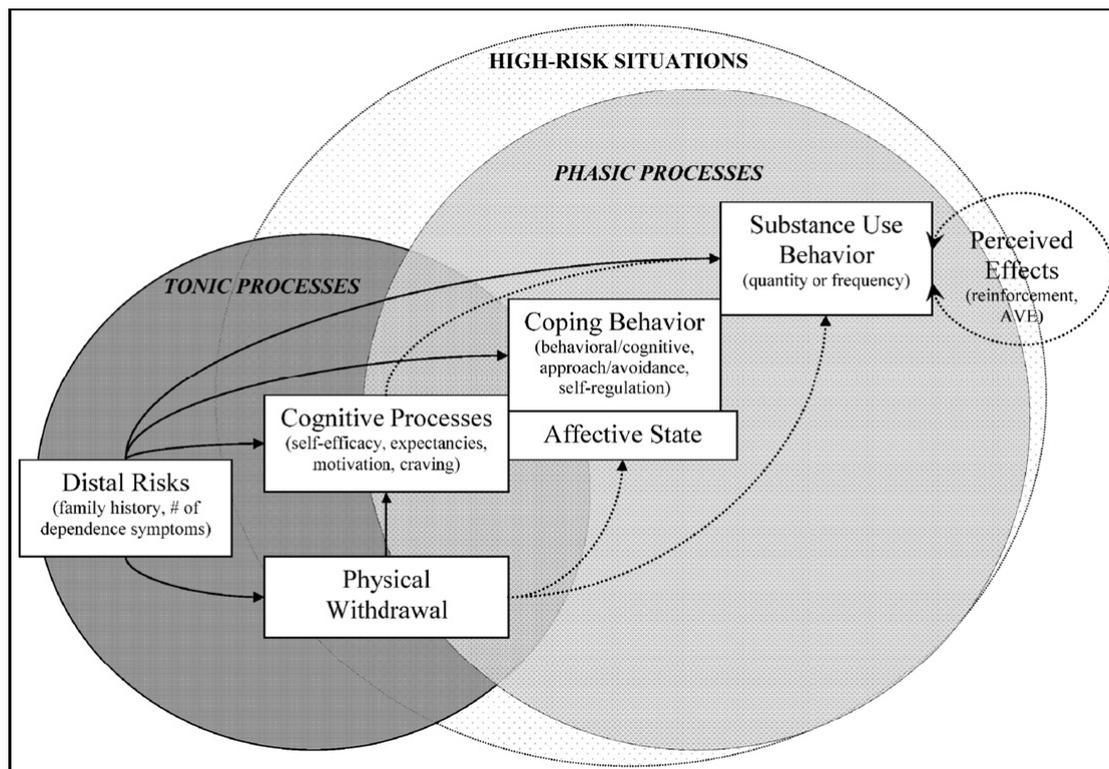
Figure 1. Dynamic model of relapse proposed by Witkiewitz and Marlatt (2004).

**McKay et al. (2006)** investigate study design issues with distal and proximal factors in relapse processes:

- Prospective studies have been used to examine distal (see Figure 1) or background factors in relapse of substance abuse. Variables are assessed at various points in time such as 3 months, 6 months, and 1 year. Strengths include decay of memory not a major issue as participants reporting relatively recent thoughts, feelings, and experiences. Also self-reports are not influenced by the relapse episode itself, as it has not occurred at that time.
- Studies using prospective designs have lag times of around 3 months between assessment of predictors and relapse while investigations of shorter duration are rare.
- Investigations of proximal factors identify an individual's experiences at the time of lapse or relapse. These factors include cognitions, beliefs, moods, interpersonal experiences, and other situational factors that are present shortly before or at the onset of a relapse.
- Recent trend towards obtaining data on a more frequent basis - "near real time studies" - using various sources of data such as daily diaries, interactive voice response, ecological momentary assessment (EMA) - "electronic diaries".
- Previous studies examining distal and proximal characteristics indicated that distal measures provided a good indication of the likelihood of relapse, whereas proximal measures predicted how severe the next episode of substance abuse would be.
- Authors advocate strengths of retrospective reports, for example "the moment in truth" when a person takes the first drink of the relapse process - what is going on in their minds? High tech methodologies unable to capture such data.
- From a neurobiological perspective some individuals have stronger cravings for alcohol and drugs or less effective coping behaviours influenced by factors such as neurochemistry, receptor availability, natural reward circuitry, and stress reactivity.
- Explanatory models of relapse processes using psychological, behavioural, demographic, and environmental factors have been successful, but only explain a

small portion of variance. Although complex, findings from biological studies appear to have a significant role in explaining relapse.

Theories of relapse are presented by **Brandon et al. (2007):**
- More than two decades since the concept of relapse shifted from a discrete or dichotomous state to a continuous process, however it is still often treated as the former (see studies in Table 1).
- Definitional difficulties of relapse are associated with assessment challenges, including repeated measures of multiple variables such as frequency and intensity of the target behaviour, and cognitive and affective indicators.
- Using analogies from physical illnesses the authors state that remission and relapse should not be viewed as end states, "but rather as data informing decisions about the need for treatment adjustments."
- To date there has been little investigation of relapse processes between individuals making behavioural changes on their own compared with those receiving treatment. Models of relapse specific to treatment have also not been adequately examined.
- Relapse models specific to addiction could have wider relevance to other disorders; the converse could also exist with common elements underlying the processes.

Table 1. Summary of studies examining predictors/factors associated with relapse in problem gambling.

| Authors (Journal) | Year | N | *Outcome measure* | Model /findings (variance explained) | *Comment* |
|---|---|---|---|---|---|
| Goudriaan et al. (Psychological Medicine)[5] | 2007 | 46 | Participants categorised as either "relapser" or "non-relapser" based on response to "Do you think that you have a gambling problem again" (Yes/No) | Logistic regression: Duration PG (24 %) + disinhibition and decision-making + self-report measures (31 %). | Neurocognitive measures of disinhibition and decision making was predictive of relapse. Not self-reported measures of impulsivity and reward sensitivity. Authors suggest further studies include treatment adherence, recent life events precipitating relapse, and co-morbid psychopathology. |
| Namrata & Oei (International Journal of Mental Health Addiction) | 2007 | 329 | "not applicable / got worse/ unchanged / partially resolved / or improved to clients satisfaction in context of 10 correlates of gambling. | Chi-square/ANOVA: those reporting partial or full resolution of most gambling correlates had higher gross income. Those reporting substance abuse problems were less likely to report partial or full resolution to certain treatment outcomes. | This study examined outcome predicting factors in relation to the resolution of the 10 correlates of gambling. In-depth clinical interview skills used to identify a number of gambling correlates including "intrapersonal" (mood swings, depression, anxiety, financial issues…etc." |
| Scherre, et al. (Addiction) | 2007 | 1675 | One or more past-year pathological gambling symptoms. | Logistic regression: socio-demographic and life-time psychiatric variables measured in 1992 were significantly associated with past year P & PG measured in 2002. e.g. ↑education = ↓OR of PG | 10-year follow-up of gambling behaviour with twins examining impact of psychiatric disorders and genetic vulnerability to PG. |
| Tavares & Zilberman (Alcoholism: Clinical and Experimental Research) | 2005 | 101 ADS  49 PG | Comparative study between PG & ADS for cravings using measures: interview, Temperament and Character Inventory, and Beck scales for anxiety and depression. | Linear Regression (34%). PG>ADS with cravings. Negative correlation between PG craving and abstinence. | Conclude that cravings in PGs potentially cause relapse. Previous study (Hodgins et al. 2004) found giving into urges main cause of relapse. |

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| Authors (Journal) | Year | N | Outcome measure | Model /findings (variance explained) | Comment |
|---|---|---|---|---|---|
| Daughters & Lejuez (Journal of Gambling Studies) | 2005 | 32 | Delayed relapsers (n=16)- current PG who had at least one sustained period of gambling abstinence ≥ 3 months.<br><br>Immediate relapsers (n=16) - PGs who had never remained abstinent for a period > 2 weeks. | Immediate relapsers displayed higher levels of negative affect and stress reactivity. Also less likely to persist on psychological stressor. | Immediate relapsers unable to manage initial discomfort of abstinence-play important role in treatment outcome. |
| Hodgins & el-Guebaly | 2004 | 101 | Abstinence/non-abstinence | Open-ended descriptions ranged from cognitive to emotional factors, to aspects of the situation e.g. cognitions about winning . Women>men reporting gambling to deal with negative emotions or situations. | Study examined retrospective and prospective reports of precipitants to relapse in PG. |
| Echeburua et al. (Behavioural and Cognitive Psychotherapy) | 2001 | 69 | gambling relapse was defined as "more than two isolated episodes of gambling in the 12 months follow-up or a total expense higher than a week of gambling before the treatment" | Discriminant analysis: Satisfaction with treatment + alcohol consumption at pre-treatment + neuroticism (91.3 % classification of cases) | Examined demographic, personality, and psychopathological variables as predictors of relapse in slot-machine gamblers. |

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# APPENDIX 3: DELPHI QUESTIONNAIRE 1

## INTRODUCTION

There is a lack of theoretical understanding regarding the aetiology and treatment of problem gambling, which has a significant impact on the establishment of effective evidence-based treatment programs. The measurement of gambling related problems is an ongoing challenge with no consistent definitions of abstinence and controlled gambling. There are also no clear definitions of gambling lapse and gambling relapse. Problem gambling is proposed to have a similar aetiology to other addiction models, including alcohol.

Understanding the process of relapse into problem gambling will help improve treatment retention, improve treatment outcomes and help predict those who are vulnerable to relapse.

The methodology for the project **"**Predictors of Relapse in Problem Gambling" includes:

- A literature review and focus groups to examine factors that predict relapse in problem gamblers and alcohol and drugs of dependence.

- Your expert knowledge in gambling and/or other addiction disorders as part of a Delphi process to obtain a consensus on elements of relapse, predictors of relapse, and a definition of lapse.

- Results will be used to develop a model to explain the process of relapse into problem gambling and guide a 12-month observational study with recruitment of 100-200 problem gamblers.

## DELPHI METHOD

The elements and predictors of relapse in the following questionnaire comprise the complete list generated from a meeting with the project's advisory group. Variants of a definition for "lapse" were also proposed. Along with other national and international experts you are asked to further develop and validate the list of elements and definitions. The questionnaire comprises of three sections for your ratings:

1. Elements of relapse
2. Definitions of lapse
3. Predictors of relapse.

For the purposes of completing each section the following global definition of "relapse" is provided to guide the rating of elements, predictors of relapse and definitions of lapse:

> *Relapse is the re-emergence of gambling that may cause harm to the*
> *individual, significant others or the community after a period of abstinence*
> *or controlled gambling.*

## 1. Elements of Relapse

The following elements of relapse are listed under Cognitive, Behavioural, and Interpersonal factors. Please rate each element based on it's qualities as an indicator that a relapse is occurring in problem gambling using the scale: 1 = essential; 2 = very important; 3 = important; 4 = less important; 5 = unimportant. Use the drop- down menu to record your response by clicking on the shaded box.

### 1.1 Cognitive

(i)     I am gambling again, I'm thinking about gambling and I feel like I want to gamble
        again
unrated

(ii)    I'm thinking about gambling more than before (pre-occupation with gambling

unrated

(iii)   I'm concerned about losing control and gambling again the way I used to do

 unrated

(iv)    I'm thinking about ways to get money
 unrated

(v)     I believe that gambling is an option to solve a problem
unrated

(vi)    I tell lies to myself
unrated

### 1.2 Behavioural

(i)     I tell lies to myself and others about my gambling
unrated

(ii)    I have not told others about my worries about relapse
unrated

(iii)   My urge has returned and I can't control it
 unrated

(iv)    I'm gambling more than I think I should
unrated

(v)     I have reduced alternative leisure activities to gambling activities
unrated

(vi) I have disengaged from non-gambling activities
unrated

**1.3 Interpersonal**

(i)     Gambling is affecting my work and social behaviour (e.g. leaving work early to gamble…gambling during breaks)
unrated

(ii)    I am experiencing personal conflict about or related to my gambling
unrated

(iii)   I am suspected of gambling and have been challenged about this by significant other/s
unrated

(iv)    I have been emotionally or physically absent with significant others as a result of a pre-occupation with gambling
unrated

(v)     I am seeing old friends related to previous gambling culture
unrated

(vi)    I have withdrawn from supportive social networks
unrated

Are there any other elements that define relapse you would like to add? (Please enter in shaded area).

**2. Definitions of Lapse**

Please rank the variations of a definition for "lapse" in problem gambling after a period of abstinence or controlled gambling either 1 ( Most appropriate), 2 (Appropriate), or 3 (Least appropriate).

The following alternative definitions for lapse are where abstinence had been the goal.

1.  Lapse is a single gambling episode after a period of abstinence that does not cause harm to the individual, significant others or the community.
    unranked

2.  Lapse is a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode.
    unranked

3.  Lapse is a single gambling episode after a period of abstinence that does not involve prolonged loss of control beyond the episode, nor cause harm to the individual, significant others or the community.
    unranked

The following alternative definitions for lapse are where controlled gambling had been the goal.

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1. Lapse is a re-occurrence of a gambling episode (or pattern of gambling) that does not cause harm to the individual, significant others or the community after a period of controlled gambling and is not the start of a relapse.
   unranked

2. Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not cause harm to the individual, significant others or the community.

   unranked

3. Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve an ongoing or prolonged loss of control beyond the episode.

   unranked

4. Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve a prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.
   unranked

   Any comments about the definitions of lapse?

## 3. Predictors of Relapse

The following predictors of relapse are listed under Psychological, Psychobiological, Social and Environmental, and Treatment Factors. Within each factor the predictors are further categorised under the headings Proximal (characteristics present at time or near time of relapse) and Distal (background) factors. Please rate each element based on it's qualities as a predictor of relapse in problem gambling using the scale: 1 = essential; 2 = very important; 3 = important; 4 = less important; 5 = unimportant. Use the drop- down menu to record your response by clicking on the shaded box.

### 3.1 Psychological

**Distal Factors**

**Sensation seeking**
unrated

Extraversion & introversion
unrated

Impulsivity
 unrated

Neuroticism, psychoticism
 unrated

Locus of control
unrated

Peer and family norms
 unrated

Anxiety traits
 unrated

Avoidant coping styles
 **unrated**

**Proximal factors**
**Internal**
Negative affective state
unrated

Positive affective state
unrated

Stress reactivity
unrated

Social isolation
 unrated

Peer pressure
unrated

Grief and loss
unrated

Recurrence of cognition (erroneous)
 unrated

Affective instability
unrated

Change in coping capacity
unrated

Anxiety states
unrated

**External**
Response to social and cultural cues (internal and external)
unrated

Angry with self / angry with others
unrated

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Intoxication with drugs or other substances
unrated

Advertising

unrated

Major cultural/social events (triggers)
unrated


**3.2 Psychobiological**

**Distal Factors**
**Genetic**
Developmental disorder
unrated

Intellectual disability
unrated

Pre-existing mental Illness
unrated

Affective disorder, anxiety disorder and substance use
unrated

Personality disorders
unrated


Lack of frontal lobe inhibition
unrated

**Proximal Factors**

Environmental cues leading to physiological changes
unrated

Environmental cues leading to changes in expectations
unrated

Medication such as Zolpidem (Stilnox) causing dissociative states
unrated

Internal cues leading to physiological changes
unrated

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**3.3 Social and Environmental**

**Distal Factors**

Gambling culture
unrated

Number, proximity and types of gambling venues (opportunities to gamble)
unrated

Ethnicity
unrated

Role models
unrated

Access to money
unrated

Advertising inducements
unrated

**Proximal Factors**
High risk situations
unrated

Lack of access to supportive social support networks
unrated

Lack of involvement with supportive social networks
unrated

Access to money
unrated

Socio-economic status
unrated

Advertising
unrated

Specific learnt cues
unrated

Inducements
unrated

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**3.4 Treatments**

**Distal Factors**
Time since completing a treatment episode
unrated

Previous episodes of relapse
unrated

Self-exclusion from venues
unrated

**Treatment type**
General counselling
unrated
CBT-avoidance and distraction focused
unrated
CBT-cue exposure +/- response prevention
unrated
Other
unrated

Avoidance strategy v/s mastering urge
unrated

Episodes of treatment (number)
unrated

Stage of treatment achieved
unrated

Inpatient treatment episodes (individual help)
unrated

Voluntary help seeking v/s other motivating factors
unrated

Co-morbidities identified
unrated

**Proximal Factors**

External motivator / coercion by others rather than personal decision
unrated

Relationship with treatment provider/therapist
unrated

Stages of change (treatment readiness)
unrated

Motivation
unrated

Treatment dose – homework done (hours)
unrated

Co-morbidities addressed
unrated

Are there any other predictors of relapse you would like to add? (Please enter in shaded area).

Thank you for taking the time to complete this questionnaire. Please save and return to mailto:david.smith2@fmc.sa.gov.au

# APPENDIX 4: DELPHI QUESTIONNAIRE 2

## INTRODUCTION

Thank you for agreeing to participate in this second and final round of the Delphi process for the project "Predictors of Relapse in Problem Gambling". This questionnaire is a modified version from round one comprising of questions that did not achieve strong consensus. Questions have the additional information of the group's median ratings from round one for the elements and predictors of relapse. Group percentages for ratings of the "lapse" definitions are also provided. You are asked to re-rate each item in light of this new information. If you rate an item 2 points or more from the group median could you please comment.

Suggestions of further elements and predictors of relapse from participants in round one are also presented for you to rate at the end of each section.

A complete summary of results is also provided (attached document) including comments. If you wish to provide further feedback based on these results please use the relevant section in this questionnaire.

## DELPHI METHOD

The questionnaire comprises three sections for your ratings:

1.  2. Elements of relapse
2.  Definitions of lapse
3.  Predictors of relapse.

For the purposes of completing each section the following global definition of "relapse" is provided to guide the rating of elements, predictors of relapse and definitions of lapse:

> *Relapse is the re-emergence of gambling that may cause harm to the*
> *individual, significant others or the community after a period of abstinence*
> *or controlled gambling.*

### 1. Elements of Relapse

The following elements of relapse are listed under Cognitive, Behavioural, and Interpersonal factors. Please rate each element based on it's qualities as an indicator that a relapse is occurring in problem gambling using the scale: 1 = essential; 2 = very important; 3 = important; 4 = less important; 5 = unimportant. The group median score is provided from round one. Use the drop-down menu to record your response by clicking on the shaded box.

#### 1.1 Cognitive

(vii)    I am gambling again, I'm thinking about gambling and I feel like I want to gamble again
unrated Median Score = 2

(viii)     I tell lies to myself
unrated Median Score = 3

## 1.2 Behavioural

(vi)     I have not told others about my worries about relapse
unrated Median Score = 3

(vii)     I have reduced alternative leisure activities to gambling activities
unrated Median Score = 2

## 1.3 Interpersonal

(vii)     I am experiencing personal conflict about or related to my gambling
unrated Median Score = 2

(viii)     I am suspected of gambling and have been challenged about this by significant other/s
unrated Median Score = 3

If you have rated 2 points or more from the group median of an item could you please comment (enter in shaded area).

Additional elements of relapse suggested from participants in round one:

I get into arguments with my spouse in order to have an excuse to go gamble
    unrated

Boredom
    unrated

Frequenting places associated with past gambling
    unrated

    Emotional upsets of any cause
    unrated

Spending increased time in which gambling takes place- some may be
gambling/game specific (e.g., sports wagering, Internet wagering, poker playing)
unrated

Engaging in the behaviour at the same levels - at least temporarily - before
gambling stopped
unrated

I am committing crimes to recover debt or to finance more gambling
unrated

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**2. Definitions of Lapse**

Please rank the variations of a definition for "lapse" in problem gambling after a period of abstinence or controlled gambling **either** 1 (Most appropriate), 2 (Appropriate), or 3 (Least appropriate). Each definition has the group's percentage of ratings for each level in round one.

The following alternative definitions for lapse are where abstinence had been the goal.

1.  Lapse is a single gambling episode after a period of abstinence that does not cause harm to the individual, significant others or the community.
    *(Round one: 5% -"Most appropriate"; 36%-"Appropriate"; 59%-"Least appropriate")*

    unranked

2.  Lapse is a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode.
    *(Round one: 36% -"Most appropriate"; 55%-"Appropriate"; 9%-"Least appropriate")*

    unranked

3.  Lapse is a single gambling episode after a period of abstinence that does not involve prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.
    *(Round one: 41% -"Most appropriate"; 45%-"Appropriate"; 14%-"Least appropriate")*

    unranked

The following alternative definitions for lapse are where controlled gambling had been the goal.

4.  Lapse is a re-occurrence of a gambling episode (or pattern of gambling) that does not cause harm to the individual, significant others or the community after a period of controlled gambling and is not the start of a relapse.
    *(Round one: 40% -"Most appropriate"; 15%-"Appropriate"; 45%-"Least appropriate")*

    unranked

5.  Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not cause harm to the individual, significant others or the community.
    *(Round one: 16% -"Most appropriate"; 63%-"Appropriate"; 21%-"Least appropriate")*

    unranked

6.  Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve an ongoing or prolonged loss of control beyond the episode.

    *(Round one: 38% -"Most appropriate"; 57%-"Appropriate"; 5%-"Least appropriate")*

    unranked

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7. Lapse is a pattern of increased gambling behaviour after a period of controlled gambling that does not involve a prolonged loss of control beyond the episode nor cause harm to the individual, significant others or the community.
*(Round one: 40% -"Most appropriate"; 40%-"Appropriate"; 20%-"Least appropriate")*

unranked

Any comments about the definitions of lapse?

## 3. Predictors of Relapse

The following predictors of relapse are listed under Psychological, Psychobiological, Social and Environmental, and Treatment Factors. Within each factor the predictors are further categorised under the headings Proximal (characteristics present at time or near time of relapse) and Distal (background) factors. Please rate each element based on it's qualities as a predictor of relapse in problem gambling using the scale: 1 = essential; 2 = very important; 3 = important; 4 = less important; 5 = unimportant.
The group median score is provided from round one.

### 3.1 Psychological

**Distal Factors**

**Sensation seeking**
unrated Median Score = 3

Avoidant coping styles
**unrated** Median Score = 3

**Proximal factors**
**Internal**
Positive affective state
unrated Median Score = 3

Social isolation
unrated Median Score = 3

Grief and loss
unrated Median Score = 3

**External**
Angry with self / angry with others
unrated Median Score = 3

### 3.2 Psychobiological
**Proximal Factors**
Environmental cues leading to changes in expectations
unrated Median Score = 3

**3.3 Social and Environmental**

**Distal Factors**
Gambling culture
unrated Median Score = 3


**Proximal Factors**
Inducements
unrated Median Score = 3

**3.4 Treatments**

**Distal Factors**
Self-exclusion from venues
unrated Median Score = 3

**Treatment type**
General counselling
unrated Median Score = 3

CBT-avoidance and distraction focused
unrated Median Score = 2

Other
unrated Median Score = 3

**Proximal Factors**
Stages of change (treatment readiness)
unrated Median Score = 2


If you have rated 2 points or more from the group median of an item could you please comment (enter in shaded area).



Additional predictors of relapse suggested from participants in round one.

Level of education in context of how well the client can incorporate what they have learned in treatment into their lives
unrated

Whether or not the client has children
unrated

Gamblers Anonymous (GA) attendance
unrated

Genetic predisposition

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unrated
Extent to which the individual keeps problem secret from others.
unrated

Extent of "mind betting" (making wagers without placing a bet to see if the outcome can be predicted) or playing "free poker," or "free slots," etc. on the web or handheld device
unrated

The desire to see if they are capable of gambling in a controlled fashion after a significant period of abstinence
unrated

Major traumatic life events
unrated

Significant increase in gambling opportunities/venues
unrated

Spousal/marital/familial discord
unrated


Thank you for taking the time to complete this questionnaire. Please save and return to mailto:david.smith2@fmc.sa.gov.au.

# APPENDIX 5: OBSERVATIONAL STUDY MEASUREMENT SCALES

**Measurement Tools for the Observational Study**

| Measurement tool | Number of items | Subscales | Scale range |
|---|---|---|---|
| Gambling Urge Scale (GUS) | 6 | -urge | 1-7 Likert |
| Gambling Related Cognition Scale (GRCS) | 23 | -illusion of control<br>-predictive control<br>-interpretative bias<br>-expectations of gambling<br>-uncontrollable nature of gambling | 1-7 Likert |
| Depression Anxiety Stress Scale (DASS) | 21 | -depression<br>-anxiety (state)<br>-stress | 0-3 Likert |
| Alcohol Use Disorders Identification Test (AUDIT) | 10 | -hazardous drinking<br>-dependency<br>-harmful drinking | |
| Multidimensional Scale of Perceived Social Support (MSPSS) | 12 | -family<br>-friends<br>-significant others | 1-7 Likert |
| Victorian Gambling Screen (VGS) | 21 | -enjoyment of gambling<br>-harm to partner<br>-harm to self | Likert |
| Work and Social Adjustment Scale (WSAS) | 5 | -work<br>-home management<br>-social leisure<br>-private leisure<br>-family and relationships | 0-8 Likert |
| Arnett Inventory of Sensation Seeking (AISS) | 20 | -novelty<br>-intensity | 0-4 Likert |
| Spielberger Trait Anxiety Inventory (TAI) | 20 | -anxiety trait present<br>-anxiety trait absent | |

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# THE DEFINITION AND PREDICTORS OF RELAPSE IN PROBLEM GAMBLING

# A FOCUS GROUP STUDY

Commissioned by

Gambling Research Australia (GRA)

**November 2008**

Prepared By

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# EXECUTIVE SUMMARY

## Background

This current report provides knowledge around the predictors and processes involved in episodes of relapse acquired from clients, significant others and workers with direct experience of gambling relapse. It describes the processes involved in relapse and concludes by providing a framework for conceptualising this process.

## Methodology

The focus group methodology was chosen because this group interview process is an accepted method for obtaining qualitative data for sociological enquiry in applied research (Morgan, 1996).

Three facilitators were involved in the conduction of the focus groups. One facilitator was a research officer working part time in the Flinders Human Behaviour and Health Research Unit (FHBRU). She has a background in CBT working as a senior therapist within the SGTS. The second facilitator was a Project Officer (FHBRU) and the third an independent facilitator who is a senior lecturer at the School of Medicine, Department of Psychiatry, Flinders University

The focus group participants were from four groups of people who were considered to have intimate knowledge of the relapse process and problem gambling. SGTS therapists with a specific cognitive behavioural orientation focussed on urge exposure and response prevention clients who had completed the SGTS therapy their significant others or partners, workers from non-government organisations (NGO) and the Gambling Helpline and, problem gamblers who had been involved in two different types of self help programs such as Pokies Anonymous and a Consumer Voice Program.

- State Wide Gambling Therapy Service (SGTS) workers
- SGTS Clients
- Non-Government Organisation (NGO) and other workers
- NGO Clients.

There were 36 participants in the focus groups. A total of 21 participants were directly involved with the SGTS program by either providing cue exposure treatment or having received this therapy or being a partner of someone who had received this therapy. The remaining 15 had no involvement with the SGTS program and were chosen to balance the two SGTS focus groups. The fidelity of the methodology and the analytic process was reviewed by an external auditor. Inter-coder reliability was calculated for each focus group and for the four focus groups as a whole and was 84.8% between the two coders.

## Results

After the first round of coding a total of 27 themes relating to predictors of relapse were identified from a total of 622 open codes. A total of 6 key themes were identified from the initial 27 themes. These included: cognitions, urge, the intervention, quality of relationships, negative affective states and environmental factors. All the individual focus group participants' comments were put together in the analysis. Therefore the references to "some" or "others" are individual participants across all 4 focus groups.

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## Hypotheses

A total of 18 hypotheses were generated from the data to explain the relationships seen within the 6 themes by the process of comparative analysis. One final hypothesis was established that described the findings:

*Relapse comprises a sequence of mental events and behaviours which evolves over time during each relapse episode and is modified by factors that "push" this sequence towards and others that "pull" the problem gambler away from relapse in their gambling behaviour.*

The process of a relapse was found to be complex and usually involved more than one predictor. It was established from the data that a combination of predictors such as the urge to gamble, cognitions and negative affect increased the risk of relapse. This process was likened to a "push" towards a relapse. At a critical point the decision to gamble is made and relapse seems inevitable. For others there were factors that "pulled" the client away from a relapse such as vigilance, social support, management of gambling risks, behaviours and cognitions as well as effective treatment. Some clients believed they could eliminate the risk of relapse whilst others had to manage the risk factors to reduce the risk of relapse often by avoidance of risky situations.

## The "push" factors towards a relapse

Some gamblers seemed to be able to defer gambling but were aware they would relapse at some time in the future. The decision was suspended and relapse at this time seemed to be deferred, often when the gambler was highly stressed. The decision to relapse seemed to be made to reduce very high levels of arousal of problem gamblers when the temptation to gamble was triggered within them. For some this was an immediate, uncontrollable urge that could not be resisted and had to be immediately satisfied, for some the decision could be made to relapse but to defer the gambling behaviour, and for others a struggle was initiated of push and pull factors that often culminated in relapse behaviour. Once the decision to gamble was made this seemed to alter the problem gambler's cognitive functions such that they seemed no longer to be able to engage in: self-observation, critical thinking, accessing memories of negative consequences of gambling and to exercise the will in respect of gambling cognitions, urges and behaviour. This state of mind was described by participants as "the zone", from which it appeared to be difficult to exit except by running out of financial resources.

## The "pull" factors from relapse

The second part of the process is described as the "pull" from relapse. Factors that "pull" problem gamblers away from relapse included treatment interventions and beliefs; cognitive factors, avoidance, distraction, memories, fear and images of previous negative consequences and positive social support. These "pull" factors appeared to influence the progression of the sequence of mental events at different stages of the relapse process. The central factor associated with these pull factors was the ability of the gambler to remain vigilant about the possibility of relapse, have a memory of negative events, to sustain the capacity to think critically, to self-monitor and to continue to take the responsibility for rational decision making. "Pull" factors appeared to act by decreasing the level of excitement and arousal by means of retaining an objective mindset of "vigilance". Pull factors appeared to act on the sequence of events by helping the gambler to prevent the interactions between the urge and cognitions which seemed to reduce the increasing levels of arousal. Extinction of the urge to gamble seemed to eliminate the relapse process for some.

## Findings

The derivation of this empirical model of relapse is described in the results section in detail. It has clear face validity and complements the well-known relapse prevention model (Marlatt and Gordon, 1985), pathways to relapse (Blaszczynski and Nower, 2002), and our understanding of cognitive

behavioural models of the genesis of addictive behaviours. It does however suggest that an altered state of cognition develops for problem gamblers which may be a learned decision making psychological set. These findings need to be confirmed in other studies, but there are a number of new areas for research and possible harm minimisation interventions that could be considered.

## Recommendations

### Clinical practice

Treatment issues emerged as an important focus in this study. Those treated specifically with an urge reduction and response prevention strategy within a comprehensive cognitive behavioural approach clearly seemed to fare well when confronted with relapse situations.

- Negative affect is secondary to a wide range of co-morbidity associated with gambling. This suggests a mental health assessment should be made for all persons presenting for treatment for problem gambling
- Treatment of the urge to gamble should be explored as a treatment option by gambling help agencies.

### Research

1. There is a need to compare different treatment modalities for problem gambling. This study suggests that urge exposure and response prevention is effective in problem gambling treatment and needs to be empirically tested.

2. The findings of this study need to be tested with a number of other focus group populations to ascertain if the findings are valid for groups not represented in the four focus groups. As such we recommend the following focus groups need to be conducted:

   - Clients receiving a variety of CBT strategies including cognitive therapy alone, and other service models such as SMARTRecovery which focuses upon different aspects of the intervention or relapse process

   - Non treatment seeking problem gamblers

   - Aboriginal and CALD clients exploring the presence of cultural factors in the context of relapse

   - Problem gamblers with co-morbid mental health disorders and personality traits such as impulsivity, sensation-seeking, disinhibition and susceptibility to reward.

3. The sequence of mental and behavioural events described in this study present many important questions that need to be answered if relapse in problem gambling is to be fully understood. Further exploration that looks at aspects of this process are needed in order to test generalisability to other populations and to better describe its characteristics. There are a number of areas that need to be explored which include following:

   - These findings have pieced together what appears to be a process over time that has several patterns and is unique in its details for each person. Whether this is actually so for individual problem gamblers needs to be established and can only be done using a methodology such as an in-depth interview

- The characteristics of the apparent altered cognition prior to and during relapse need to be described and evaluated

The capacity for problem gamblers to learn when they appear to move into and out of an altered cognitive set or altered state of consciousness has important implications for treatment. Research needs to whether therapy of any sort may be ineffective, and if this is so, ways of interrupting this altered state of consciousness during relapse ("the zone") need to be considered.

4. Machine Design:
   Developing public health interventions to minimise the harm which occurs when problem gamblers are in an altered state of consciousness ("the zone") needs to be explored. This altered state of consciousness appears to have features consistent with the problem gambler being in a dissociative state. The potential exists for EGMs to be programmed to recognise patterns of the use of these machines that are indicative of problem gambling and in those situations "pop up" messaging could assist problem gamblers to escape from this altered state of cognitive function as a harm reduction intervention.

## Conclusions

This research has helped to gain a deeper understanding of the process of gambling relapse, which appears to involve a sequence of mental events as well as being influenced by modifying factors that lead either to "push" towards relapse or the "pull" from relapse. Additionally this study provides a new insight into the predictors of relapse, treatment options for problem gambling and relapse prevention strategies. Therapy aimed at urge extinction appeared to enable some clients to think clearly and not enter altered cognitive states, resulting in long term resilience against a gambling relapse. A number of research directions have been suggested that would help to further understand these processes.

# PREDICTORS OF RELAPSE IN PROBLEM GAMBLING: A FOCUS GROUP STUDY

## 1. INTRODUCTION AND RATIONALE FOR THE STUDY

### 1.1 Background

This study forms part of the project commissioned and funded by the Gambling Research Australia (GRA) to investigate the contributors and precipitants for relapse in problem gambling behaviour to see if this process can be more reliably predicted and, more importantly, prevented.

This Focus Group Study comprises one of the four components of the overall project:

- The first component was the Literature Review (Smout et al., 2008), which identified many aspects of the phenomenon of relapse that remain poorly understood as individual, isolated components and the ways in which these components interact with one another to result in relapse
- The second component is the Delphi Study on the definition and potential predictors of relapse
- The third component is this Focus Group Study, which aims to describe the phenomenon of the relapse process as perceived from a number of subjective perspectives
- The fourth and final component of the project is the clinical prospective study of predictors of relapse.

This Focus Group Study seeks to describe the phenomenon of the risk factors and the relapse process as perceived from multiple, subjective perspectives. It also builds upon the work in progress in the two other components of the project: the Literature Review and the Delphi Study. This current report provides new knowledge regarding the risk factors and processes in relapse. It generates themes about these processes and concludes by providing a framework for conceptualising relapse.

A qualitative research design was selected because it provides the ability to describe and examine a social phenomenon using the rich information obtained from problem gamblers, treatment providers, counsellors and participants (Patton, 1990). The use of focus groups enabled the collection of substantial textual data that could then be subject to content analysis based on grounded theory (Douglas, 2003).

The following definition of an "urge" by Marlatt and Gordon (1985) will be used in this report: "a relatively sudden impulse to engage in an act." A craving is defined as "a subjective desire to experience the effects of the consequences of a given act" (Marlatt, 1985).

The following definitions of relapse and lapse were used based on the Delphi group findings:

- A lapse was defined as a single episode after a period of abstinence; relapse was defined as more than a single episode of gambling after a period of abstinence.
- A lapse consisted of a single episode of gambling over and above that defined by the client as controlled gambling, and relapse more than one episode of gambling over and above that defined by the client as controlled gambling.

### 1.2 Rationale for the use of a qualitative, focus group methodology

Focus group methodology was chosen because this process is an accepted method for obtaining qualitative data for sociological enquiry in applied research (Morgan, 1996). A survey interview limits what respondents say about sensitive topics, in comparison to what they disclose in focus groups. The focus group interview uses a small group of people to reflect on questions asked by the interviewer.

The participants can then hear each others' responses and make additional comments that go beyond their own original comments. It is not necessary for the group to reach a consensus. The use of focus groups provided the researchers with the ability to gain rich data from participants who had either a direct understanding of problem gambling as a problem gambler or a significant other or indirect experience as a worker in the area of problem gambling.

## 2. LITERATURE REVIEW

The Literature Review relevant to this study has been provided in the Literature Review Report. A specific aspect of the review concentrated on qualitative studies of both gambling and other addictions. These findings have informed the design of this study including the range of factors and processes used in the prompting questions for the focus groups.

## 3. METHODOLOGY

### 3.1 Sample selection

Purposive sample selection (Patton, 1990) was used for this study in order to examine relapse from multiple perspectives and to ascertain how the process of relapse occurs. It was considered that four groups of people would have intimate knowledge of the relapse process:

- State Wide Gambling Therapy Service (SGTS) workers
- SGTS clients
- Non-Government Organisation (NGO) and other workers
- NGO clients.

### 3.2 Characteristics of the focus group participants

See Appendix 4 for a detailed description of participants.

#### 3.2.1 Statewide Gambling Therapy Service workers

This group comprised 11 expert clinicians in the areas of CBT who had worked at the Statewide Gambling Therapy Service (SGTS); all were graduates of the Mental Health Sciences Postgraduate Programs at Flinders University specialising in CBT, and nine had achieved the Masters Degree.

#### 3.2.2 Statewide Gambling Therapy Service clients

This group comprised 10 clients and their significant others from rural and metropolitan areas who had graduated from the specific CBT programme offered at the SGTS.

#### 3.2.3 Non-Government Organisations and other workers

This group comprised 9 workers from non-government organisations and the Gambling Helpline.

- PEACE Multicultural Gambling Help Service (N=1 Social worker)
- The Gambling Helpline (N=2 Registered nurses)
- Nunkuwarrin Yunti (N=2; 1 Social worker and 1 financial counsellor)
- Relationships Australia (N=4; 2 Social workers, 1 counsellor and 1 financial counsellor).

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### 3.2.4 Non-Government Organisations' Clients

- Pokies Anonymous (N= 4)
- The Client Voice Program (N=2)

Participants were invited in order to capture a broad sample of problem gamblers, their significant others, health professionals and culturally diverse communities from urban and country South Australia. Overall it was considered that the groups were representative of the clients and workers as seen in the wider range of services provided for those affected by problem gambling in South Australia.

## 3.3 Consent process

The Flinders University Social and Behavioural Research Ethics Committee approved this proposal. Key workers were approached and asked to identify clients with a history of gambling-related problems or workers who had experience with clients presenting with gambling-related problems. All participants approached were happy to be involved in the research; however two workers and one client who had agreed to participate did not attend on the day. Participants were provided refreshments and parking permits. The consent process included the provision of Information Sheets to participants describing the focus group process, importance of the research, possible risks and benefits, confidentiality and the voluntary nature of participation in the study. A consent form was signed to complete the process. Sample documentation is shown in Appendix 1 (letter of introduction) and Appendix 2 (consent form for participants).

## 3.4. Conduct of the focus groups

The Literature Review and the emerging data from the consultative Delphi Study helped to define the content to be covered in each focus group. The conduct of the group was based on Breen's guide for the conduct of focus group research (Breen, 2006). Three focus group facilitators were involved in the conduct of the focus groups. One facilitator was the research officer working part time in the Flinders Human Behaviour and Health Research Unit (FHBRU) and had a background of CBT working as a senior therapist within the SGTS. The second facilitator was a Project Officer (FHBRU). The third facilitator was a senior lecturer at the School of Medicine, Department of Psychiatry, Flinders University. An interview guide was developed comprising a list of questions and issues to be explored during the course of the interview (Patton, 1990) (see Appendix 3). These questions covered the following areas: psychological factors (cognitive, affective, personality), psychobiological factors, social and environmental factors, and treatment modalities associated with possible predictors of relapse. Although mental health co-morbidity was not included in the guiding questions, it was raised in each focus group.

The groups were conducted in a planned and standardised fashion (Breen, 2006). The focus-group interview schedule was preceded by the welcome and consent process, gathering of background information and mingling of participants. An overview of the purpose of the groups was provided by the moderator with a statement of the ground rules of the focus group. This included emphasis on the confidentiality of the content of the information and discussions within the group and that this personal information should remain private. The group process then started with the moderator asking participants to share about their general experiences of relapse. The questions progressed to specific relapse risk factors according to the focus group guiding questions. The focus-group moderator facilitated the group by asking participants to share and compare their experiences and to discuss the extent to which they agreed or disagreed with each other about the issues that were raised. The groups generally moved from topic to topic pertinent to the discussion guide with the facilitators assisting the groups to cover all questions. All the groups were recorded using an MP3 Sony Walkman, Digital Music Player. These recordings were then transcribed by a secretary and checked by the researcher

(JO) to ensure accuracy. There were no missing sections or fragments of conversation. Facilitators also took some notes during the focus group discussions.

## 3.5 Data analysis

### 3.5.1 Open coding

Open coding was conducted by the researcher. In order to maximise reliability the data was independently checked by a person who had not participated in any of the focus group interviews. Where disagreement occurred, discussion was held and a joint assignment of a code was made. In this process, code-to-sentence matches should occur in at least 80 per cent of cases to claim high reliability (Breen, 2006). This verification process involved careful review and discussion so "inter-subjective consensus" occurred (Miles and Huberman, 1994).

The transcripts of the groups comprised the raw data, which was broken down into individual components, which comprised statements relevant to relapse in problem gambling. These open codes were conceptualised and named individually by the researcher.

For example, in the first group for the SGTS clients after the introduction, a statement made by one SGTS client was: "I no longer have that urge."

This statement pertains to the urge to gamble. This was named "urge" and needed to be selected as such by each of the independent coders. Each interview was thus broken down into its component parts as the raw data.

### 3.5.2 Axial coding

Axial coding involved the aggregation of open codes into categories of data, or themes. The open codes were reviewed, grouped and were then put back together in new ways as more data was analysed within, from and between successive groups (Strauss and Corbin, 1990). For example, in the first group there were 12 comments about "urge" and "cues". This clearly led to the categorisation of "urge" as a key theme. This helped to identify concepts at an individual focus group level and across all four groups. This process of analysis involved looking for trends and patterns that occurred across each focus group. The analysis began with putting together the raw data to determine an overall picture of the process so an analysis could be made (Krueger, 1994). An example of axial coding for this research was looking at the initial categories from each transcript, such as beliefs about winning and the "thrill of a win". A detailed analysis of the process of axial coding is shown in Appendix 7. The axial coding analysis brought the open codes together. In this example the axial codes described were coded as cognitions. As can be seen this process required considerable immersion in the data, the development of hypotheses and testing them against further data. Discussion between the coders led to the development of a cumulative data set of axial codes.

### 3.5.3 Hypothesis generation and comparative analysis

Examination of the axial codes and the researcher's familiarity with the literature allowed the researcher to start to generate hypotheses about patterns that were emerging. These patterns constitute derived data from the open and axial codes. It thus appears as if new data is being introduced by the researchers, when in fact these data emerge from the process of constant comparison and hypothesis generation (Patton, 1990). These hypotheses concluded the analyses of each of the principal themes that came from the focus groups, in-depth discussions by the researchers, comparison with the literature and further review of the identified codes. Thereby the data was reorganised in new ways, connections were made between categories and new themes were identified, validating the relationships and refining the categories, as described by Patton (1990). An example of this process was that there were a number of times that sequences of events were described by participants,

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suggesting that relapse was a sequential process wherein one event triggered another. Again, comparisons were made with the literature, resulting in the modification of the interpretations that were being made by the researcher.

## 3.6 Conclusions and synthesis of the data

This process of data reduction helped to sharpen, sort and organise the data so "final" conclusions could be made (Miles and Huberman, 1994). The sampling process of comparative analysis continually tests the emerging data against the other data provided by the focus group participants. The process of comparative reflection against the literature and testing this with other researchers continued until theoretical saturation was achieved with each category (Strauss and Corbin, 1990). For example, co-morbidity did not emerge as important as had been anticipated. It appeared to be acting through a number of other factors, especially the negative affective states in problem gamblers when they are so vulnerable to relapse.

# 4. RESULTS

## 4.1 Open coding

The recording from each group was fully transcribed. This was checked by the researcher for accuracy and completeness. Each transcript was provided to two independent coders who systematically allocated codes to each new piece of data that related to relapse in the transcripts.

Table 5. Initial open coding of data points for each predictor of relapse across the groups.

| Open codes | SGTS Workers | SGTS clients | NGO workers | NGO consumers | Total number of items |
|---|---|---|---|---|---|
| Erroneous cognitions about gambling | 13 | 18 | 27 | 56 | 114 |
| The intervention | 49 | 18 | 12 | 8 | 87 |
| Urge to gamble | 16 | 10 | 11 | 33 | 70 |
| Social networks | 8 | 22 | 8 | 27 | 65 |
| Stress | 15 | 2 | 8 | 8 | 33 |
| Mental health Co-morbidity | 15 | 2 | 5 | 6 | 28 |
| Motivation | 6 | 3 | 6 | 11 | 26 |
| Escape | 4 | 1 | 8 | 9 | 22 |
| Theoretical models/ machine design | 11 | 1 | 4 | 5 | 21 |
| Triggers | 2 | 5 | 8 | 4 | 19 |
| Environmental factors | 13 | 2 | 1 | 1 | 17 |
| Financial stress | 3 | 7 | 3 | 3 | 16 |
| Loneliness | 4 | 2 | 6 | 4 | 16 |
| Addiction | 1 | 2 | 6 | 6 | 15 |
| Incentives to gamble | - | 4 | 7 | 2 | 13 |
| Shame | 0 | 6 | 3 | 0 | 9 |
| Culture | - | - | 8 | - | 8 |
| Events positive and negative | 1 | 1 | 2 | 4 | 8 |
| Boredom | 0 | 2 | 1 | 5 | 8 |
| Gender | 6 | - | - | - | 6 |
| Personality | 4 | 2 | - | - | 6 |
| Religion | - | - | - | 6 | 6 |
| Physical health problems | - | 1 | 2 | - | 3 |
| Neurophysiology | 2 | - | - | - | 2 |
| Access to services | 2 | - | - | - | 2 |
| Stigma | 1 | 1 | - | - | 2 |
| **Total** | **176** | **112** | **136** | **198** | **622** |

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After the first round of coding a total of 27 themes relating to predictors of relapse were identified, as shown in Table 5.

The initial categories or themes that emerged were further scrutinised and compared to each other in the process of comparative analysis, discussion and review as required in thematic textual analysis. As such these initial themes are presented for information about the way in which the analysis of the data evolved. Each of the groups presented data that was shared across the four groups, but there were also data unique to each group, except for the last group that was coded, in which all the factors pertaining to relapse had already been described in at least one other group. This failure of new data to emerge from the raw text indicated saturation of the data, which is characteristic in qualitative research and indicates adequacy of sampling and data collection (Patton, 1990). At the completion of the resorting and reclassification process the 27 themes were reduced to 6. This process is described, and the results shown, below.

### 4.1.1 Reliability of the data

*4.1.1.1 Audit trail and report*

The fidelity of the methodology and the analytic process was reviewed by an external auditor (SL) who had expertise in qualitative methodologies and mental health issues (Appendix 5). This process enabled the researchers to examine the integrity of the research. The conclusion of the auditor was that the process of the data gathering in the focus groups, the transcription and coding processes and analysis of the data had been faithfully and rigorously carried out.

*4.1.1.2 Inter-coder reliability*

Inter-coder reliability was calculated for each focus group and for the four focus groups as a whole at 84.82% between both coders, as shown in Table 6.

Table 6. Inter-coder reliability.

| Focus Group | % Agree | % Agree | % Disagree | % Disagree | % Total |
|---|---|---|---|---|---|
| SGTS Workers | 84.4 | 103 | 15.6 | 19 | 122 |
| SGTS Clients | 81.6 | 89 | 18.3 | 20 | 109 |
| NGO Workers | 89.8 | 105 | 10.2 | 14 | 119 |
| NGO Clients | 84.7 | 122 | 15.3 | 22 | 144 |
| **Combined Total** | **84.8** | **419** | **15.2** | **75** | **494** |

Inter-coder reliability was conducted after the first layer of coding. These codes were independently coded, but some of these comprised more than one code per statement. After further discussion and analysis of the data a number of statements (initial codes) related to more than one theme. For example this NGO client stated:

> *We used to say Sydney Swans got done today, I am so depressed, I will go and play the pokies.*

This quote demonstrates the presence of more than one code such as an event (football game) and a negative affect (depression).

Therefore the initial 494 codes increased to a total of 622 codes on more detailed thematic analysis during the axial coding process.

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## 4.2 Axial coding

Key themes (axial codes) were refined from the initial data points, and new categories were identified and reorganised across all four focus groups. During this stage themes identified from the Delphi process and the Literature Review were also considered in relation to the emerging data and assisted in the process of the analysis. The 6 key themes were identified from the initial 27 sub themes (Table 5). These emerging patterns were constantly rechecked against the data. These key themes were discussed with the project team, experts in the field of addiction (three psychiatrists, one psychologist, a clinician and a research project officer), at a research meeting. A consensus was reached, with the team supporting these findings.

The process of analysis of the data enabled the researcher to be in an ideal position to provide inductive interpretation of the meanings of what participants had said about their experiences of relapse. As such, she was able to make inferences about significant findings and propose hypotheses about relationships within the data set. The researcher could then own these interpretations after she had given meaning to the findings from the data by providing explanations and drawing conclusions in a process of interrogation of the data as well as reflection and discussion with colleagues (Patton, 1990). The six key factors clearly related to relapse emerging from the data are presented in Table 7. These factors are described in detail using verbatim quotations in Appendix 8.

Table 7. Key predictors of relapse (themes).

| Theme | Number of open codes allocated |
|---|---|
| Cognitions | 155 |
| The intervention | 138 |
| Urge to gamble | 104 |
| Quality of relationships | 95 |
| Negative affective states | 92 |
| Environmental factors | 30 |
| **Total** | **622** |

### 4.2.1 Hypothesis generation and constant, comparative analysis

In this analytic process, results from the focus groups are presented in the following ways: first a description is given of each of the dominant characteristics of the identified risk factors for relapse. Sub themes are then combined to create hypotheses. As described above comparative data analysis and hypothesis generation occur concurrently as part of the grounded theory approach. Much thought was given to the nature, roles and effects of the data points within each factor for relapse and also how each of the six factors might influence and relate to one another to culminate in relapse (or not) for each problem gambler. This process resulted in the emergence of new derived data pertaining to the relationships that were observed between relapse themes and sub themes. Whilst Table 7 lists these factors according to a hierarchy defined by the frequency with which participants referred to them, the results are presented in a sequence that describes the relapse process that emerged during this analytic process (Table 8).

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Table 8. Key themes in the relapse process.

| Theme | Number of open codes allocated |
|---|---|
| Environmental factors | 30 |
| Negative affective states | 108 |
| Cognitions | 139 |
| Urge to gamble | 104 |
| Quality of relationships | 95 |
| Intervention | 138 |
| **Total** | **622** |

Focus group data leading to the generation of hypotheses is provided in Appendix 8.

## 4.3 Environmental factors in relapse

Participants from each focus group identified various environmental factors that increased the risk of a gambling relapse. A total of 30 data points were identified (Table 9). These factors included two sub themes designated as the gambling environment and perceived incentives to gamble.

Table 9. Environmental factors in relapse.

| Section - appendix | Allocated codes | Environmental factors |
|---|---|---|
| 4.3.a. | 17 | Gambling environment |
| 4.3.b. | 13 | Incentives |
| | 30 | Total |

### 4.3.1 Generation of hypotheses from the environmental theme

The extensive increase in the opportunities to access a gambling facility and money was identified to increase the risk of a relapse by participants. Often the random reinforcement of some gaming machines, incentives and the ambience of the environment were enticing to clients and were predictive of a relapse for the more vulnerable. Some chose to avoid these venues in an attempt not to gamble. Stimuli were specific to some individual participants, but common to all were the features of attractiveness, excitement, welcome, reward and timelessness, a place to go when rest, recreation or reward were needed.

*Hypothesis 1: Environmental cues provide triggers for relapse back to gambling.*

*Hypothesis 2: There are multiple operant rewards in gambling venues which shape gambling behaviour and make relapse more likely.*

## 4.4 Negative affective states as a factor for gambling relapse

108 codes were identified and grouped as negative affective states (Table 10). This theme comprised six sub themes of co-morbidity, stress, escape, boredom, financial stress and physical health. Each of these affective states shared negative affect as the central common feature so were allocated to this theme.

Table 10. Negative affective states as a factor for gambling relapse.

| Section- appendix | Allocated codes | Negative affective states |
|---|---|---|
| 4.4.a. | 28 | Co-morbidity |
| 4.4.b. | 33 | Stress |
| 4.4.c. | 22 | Escape |
| 4.4.d. | 16 | Financial stress |
| 4.4.e. | 8 | Boredom |
| 4.4.f. | 3 | Physical health |
| | **108** | **Total** |

### 4.4.1 Generation of hypotheses from the negative affective theme

Initially these sub themes appeared to be a series of separate themes acting as risk factors for relapse.

These were: mental health co-morbidity, which included anxiety disorders, depression, and substance use disorders; emotional states such as anger, shame, loneliness, and boredom; and stressful life events such as grief and trauma and the stress of daily living, including financial stress, physical illness, injury and pain. The common factor to all these situations was the subjective, negative affective experience that had been present for each of the problem gamblers in the situations that led to relapse. Gambling was perceived as a way to either escape from or cope with these stressful negative affects, thereby becoming a powerful factor in relapse. Negative affective states appeared to lead to relapse by initiating or triggering gambling cognitions and/or the urge to gamble.

Problem gamblers described that they were relieved from the distress caused by the negative affective states by being "numbed out" by gambling behaviour. Interestingly, while some gambled to escape the negative emotions associated with depression, some clients developed depression secondary to gambling problems, creating a cycle in which repeated relapse was likely. Those who used alcohol were thought to have lower inhibitions, and engaging in gambling behaviours was more likely when under the influence of alcohol. Physical illness was acknowledged by some participants to increase a vulnerability to relapse. Once again gambling was seen as a distraction from these issues when encountered by some problem gamblers.

*Hypothesis 3: In some problem gamblers the presence of negative affective states initiates a sequence of events that increases the risk for relapse.*

*Hypothesis 4: Negative affective states secondary to gambling problems create a vicious cycle in which repeated relapse is likely.*

### 4.5 Cognitions as a factor in gambling relapse

Cognitions relating to gambling were identified as significant risk factors for a gambling relapse. 139 data points were assigned an open code of cognitions across all 4 focus groups. These codes included 5 sub themes of erroneous beliefs, shame, event, gender and stigma (Table 11).

Table 11. Cognitions as a factor in gambling relapse.

| Section- appendix | Allocated codes | Cognitions |
|---|---:|---|
| 4.5.a. | 114 | Erroneous Beliefs |
| 4.5.b. | 9 | Shame |
| 4.5.c. | 8 | Event |
| 4.5.d. | 6 | Gender |
| 4.5.e. | 2 | Stigma |
| | **139** | **Total** |

**4.5.1 Generation of hypotheses from the cognitive theme**

Strong sequential relationships between different major factors (themes) pertaining to relapse emerged through the process of analysis. As seen above environmental triggers and negative affects were described as initiating the process of relapse. These triggers then seemed to elicit cognitions about gambling.

Focus group data thus suggested a sequence of factors leading to gambling relapse (see examples in Appendix 8). With relation to cognition, it appeared that cognitions could directly or indirectly increase or decrease the intensity of the urge to gamble and thus the likelihood of relapse.

A sequence of factors leading to relapse began to emerge: an initiation of cognitions about winning money was generated from an adverse event such as a difficult financial situation, leading to a negative affective state, which in turn initiated the cognitions. These cognitions, including paralogical reasoning were described by a number of participants as they appeared to focus on thoughts about winning followed almost instantaneously by an awareness of the urge to gamble. This in turn appeared to precipitate further cognitions rationalising gambling and the likelihood of winning. At this time rational thinking appeared to be minimised, enhancing the intensity of the urge to gamble. It was as if there was a mental struggle occurring which resulted in critical thinking being either enhanced or suspended; once the ability to think critically was suspended relapse appeared to be inevitable. These mental events together appeared to "push" the gambler towards relapse.

It was evident from the data that a cue or trigger, such as a negative mood state, could be relieved temporarily by the hope or positive cognition about winning money from gambling. These cognitions seemed to elicit an urge to gamble that progressed into a chain of mental and behavioural events in which possibly the arousal experienced by the client resulted in the suspension of critical thinking, failure of memory for the negative consequences of previous gambling behaviour, the ability to self-observe and the exercise of the will, resulting in a gambling relapse. These mental events together appeared to "push" the gambler towards relapse. It was only the few negative cognitions, described in Appendix 8, which appeared to stand in the way of the relapse process; this has been designated as the "pull" away from relapse. Also discussed in Appendix 8 is the emergence of data from problem gamblers treated with urge exposure and response prevention, for whom urge appeared to have been extinguished. Four of the five participants seemed to be no longer vulnerable to relapse by their own reports, which were confirmed by their significant others. One participant who had attended for general counselling and as a member of PA described the same apparent urge extinction and low risk for relapse.

*Hypothesis 5: Cognitions can directly and indirectly increase or decrease the intensity of the urge to gamble and the likelihood of relapse.*

*Hypothesis 6: The increasing arousal associated with an urge to gamble initiates a process of illogical cognitions about winning and a suspension of critical thinking about anticipated gambling resulting in relapse.*

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*Hypothesis 7: Treatment that effectively manages the urge will lead to the return of critical thinking processes and reduce the risk of relapse.*

## 4.6 Urge as a factor in gambling relapse

104 open codes that related to the urge to gamble were identified across all 4 focus groups. Interestingly the data points relating to urge were mentioned 33 times by NGO clients and 11 times by NGO workers in comparison to 10 times by the SGTS clients and 16 times by the SGTS therapists who had been engaged in a therapy which addressed urges. Categories were allocated to the data points describing different aspects of the urge to gamble, which were designated to three sub themes of urges, triggers and addiction (Table 12).

Table 12. Urge as a factor for relapse in gambling behaviour.

| Section-appendix | Allocated codes | Urges to gamble |
|---|---|---|
| 4.6.a. | 70 | Urges |
| 4.6.b. | 19 | Triggers |
| 4.6.c. | 15 | Addiction |
| | **104** | **Total** |

### 4.6.1 Generation of hypotheses from themes relating to gambling urges

At this stage of the data analysis an intimate relationship between cognitions about gambling and the intensity of the urge to gamble became more apparent. These factors were also set within a time frame and a progressive sequence which could be pieced together by further re-examination of the data through constant comparative analysis and hypothesis generation, in the process of which new derived data emerged (see Appendix 8). The data obtained from the focus groups indicated individual variation in coping with the urge to gamble. For some it was a daily struggle not to gamble, and avoidance strategies were developed in an attempt to reduce the possibility of gambling in the presence of an urge and the risk of relapse. These strategies varied between participants and offered some sense of control as long as the problem gambler was not complacent. This perceptual set appeared to make such people more vigilant and focussed upon the negative consequences of previous gambling behaviour, increasing their fear and avoidance of situations of risk so that relapse did not occur. In the presence of an increasing urge to gamble problem gamblers found it difficult to think rationally by discounting the reality of the situation and consequences of the gambling. It was clear that for those who described urge extinction a return to rational thinking was possible, as was the overcoming of their gambling problem and risk of relapse.

*Hypothesis 8: There is a sequence of mental events involving the urge to gamble that increases or decreases the intensity of the urge, arousal and the risk of relapse.*

*Hypothesis 9: The intensity of urge and physiological arousal fluctuates over time.*

*Hypothesis 10: Urge extinction is the most effective in reducing the risk for relapse.*

*Hypothesis 11: The intensity of the urge or physiological arousal results in alteration of cognitive functions.*

## 4.7 Quality of relationships as a factor in relapse of problem gambling

A total of 95 data points described the effect of relationships in relapse of problem gambling. These categories were designated to four sub themes: social support, loneliness, culture and religion.
Table 13. Social support as a factor in relapse.

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| Section-appendix | Codes | Quality of relationships |
|---|---|---|
| 4.7.a. | 65 | Social support |
| 4.7.b. | 16 | Loneliness |
| 4.7.c. | 8 | Culture |
| 4.7.d. | 6 | Religion |
| | **95** | **Total** |

### 4.7.1 Generation of hypotheses from themes relating to quality of relationships

The sequence of mental and behavioural events, triggered by environmental factors and negative affective states continued to emerge throughout analysis. Triggers initiated positive cognitions, pushing the gambler towards relapse by evoking the urge to gamble. There were also negative cognitions where the gambler was able to remember the harm done by previous gambling behaviour that appeared to impede that process and "pull" the gambler away from relapse. Social support is one further factor that is extremely important in strengthening the "pull" away from relapse; correspondingly, an absence of such support creates a further "push" to make relapse more likely.

Peer support through groups such as PA was helpful in preventing a gambling relapse. Communication with and support from peers and significant others seemed to provide a protective mechanism against relapse. This protective mechanism was enhanced if the attitudes of the significant other were more forgiving of past gambling behaviours. Relationships appeared to improve with increased support between the client and their significant other. The guilt and shame that was initially felt when the client was gambling could be reduced with increased social support. This reduction of the negative affects of guilt and shame acted to lessen the risk for relapse. This axial code has also been addressed in the section 3.4 on negative affect.

For some the absence of trust and the presence of guilt and shame related to the consequences of gambling resulted in poor social support from significant others. The risk for relapse was increased in the absence of support, particularly when the client experienced guilt and shame, leading to a negative affect. It appeared negative affective states secondary to gambling problems created a cycle in which repeated relapse is likely. A counter-therapeutic relationship with a counsellor seemed to increase the risk of relapse, but a supportive therapeutic relationship provided a protective factor against relapse. Dysfunctional relationships, particularly with couples that wait for the other to take responsibility for their gambling, provided an increased risk for relapse.

Another associated risk for a relapse was the pressure from a peer to gamble. If a lapse occurs the ability to obtain support from a significant other was crucial in preventing a relapse. Consideration needs to be given to cultural issues. In light of a reported event of an Indigenous community relapsing together in their shared grief, further research into influence of the community on Indigenous problem gamblers could be profitable.

*Hypothesis 12: All positive social support acts to reduce the vulnerability to relapse.*

*Hypothesis 13: Relationship disharmony and negative social support can trigger relapse.*

### 4.8 Intervention as a factor in relapse of problem gambling

The importance of clients engaging in and completing an effective intervention program was considered to provide a protective factor against a gambling relapse. Intervention was an important issue for participants, with a total of 213 coded data points identified as relating to interventions.

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These categories were designated to three sub themes of intervention, motivation and theoretical models.

Table 14. Intervention as a factor in relapse.

| Section -appendix | Allocated codes | Intervention |
|---|---:|---|
| 4.8.a. | 89 | Intervention |
| 4.8.b. | 26 | Motivation |
| 4.8.c. | 23 | Theoretical models |
| | **138** | **Total** |

### 4.8.1 Generation of hypotheses from themes relating to interventions

Urge exposure was identified as an effective treatment to reduce, or in some cases eliminate, the risk of relapse. The rapport with the worker, understanding of treatment and degree of treatment completion were considered important in ensuring that treatment was effective and reduced the risk of relapse. Similarly, the identification of co-morbid mental health conditions and social factors were considered important for some clients engaging in treatment. The extinction of the urge to gamble as a treatment outcome seemed to provide the greatest resilience against a relapse back to gambling, although some found general counselling helpful. Coping skills were identified as important to increase the resilience of clients in treatment.

The discussions about theory and gambling behaviour provided additional information about participants' views about gambling behaviours. Perceptions about gambling held by individuals differed across the groups. For those who had a belief that gambling can be overcome, the extinction of the urge was a significant factor that clearly led to mastery over the urge to gamble, resulting in the assertion that relapse was no longer an issue.

The attendance at Pokies Anonymous appeared to provide an important support network for some clients who were motivated and inspired by others' gambling stories to refrain from gambling. The client's motivation to stop gambling, engage in and complete an effective intervention was considered important to reduce relapse. Some gamblers were able to manage their gambling problems effectively. Management of gambling was usually by the use of avoidance strategies, a range of social support, and vigilance about gambling risks while others had a belief in a "higher power" assisting them from relapsing. These clients did not believe they were "cured", so relied heavily on supportive networks and avoidance techniques to reduce the likelihood of a relapse. Additionally it was important for these clients not to become complacent about gambling, as there was a risk they could relapse. The fear generated by listening to others' stories of relapse and the inspiration that the stories provided jointly were important factors which provided a protection against relapse. These clients admitted to having to focus on being vigilant and avoidant of gambling situations, thoughts and urges to stop themselves from relapsing. The maintenance of vigilance is central to management of relapse so that cognition remains in tact.

As described above, situation dependant cognitive distortion starts to occur in the presence of particular cues for each problem gambler. Most often and most clearly this is seen within the gambling environment, and as such relapse prevention strategies wisely encourage problem gamblers to avoid this. Those gamblers who have overcome the intense urge and appear to be able to withstand the barrage of environmental stimuli which trigger cognitions, urge, excitement and arousal and cognitive distortion without relapsing.

*Hypothesis 14: Interventions based on a belief in supportive approaches leads to a reduction in relapse.*

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*Hypothesis 15: Motivation of a client to complete treatment reduces relapse.*

*Hypothesis 16: Urge exposure and response prevention based on the belief that gambling is a conditioned behaviour demonstrates that it can be treated to urge extinction and mastery of the urge, at which time relapse is reduced or eliminated.*

*Hypothesis 17: Interventions based on the belief that gambling is an addiction affect people for life.*

*Hypothesis 18: The lifelong ongoing maintenance of vigilance is central to management of problem gambling for as long as the urge to gamble is present so that cognition remains in tact and the risk of relapse is reduced.*

## 5. DISCUSSION

Open coding resulted in the identification of 622 data points, and axial coding reduced these to 6 key factors related to relapse for problem gambling. In the results thus far each of the 6 themes or principal factors in relapse in problem gambling has been presented with a summary and a number of hypotheses for each factor interpreting the findings in a way that is "grounded", i.e. there are no further data to emerge from the focus group analysis.

The final task in the analysis of the data is to integrate these findings as a whole. The hypotheses from the key factors must therefore be represented in an overarching hypothesis that leads to understanding the phenomenon in question – relapse of problem gambling.

Table 15. Hypotheses grouped together by factor analysis.

| Factor | No | Hypotheses |
|---|---|---|
| External | 1 | Environmental factors provide triggers for relapse back to gambling. |
| | 2 | There are multiple operant rewards in gambling venues which shape gambling behaviour and make relapse more likely. |
| Negative affects | 3 | In some problem gamblers the presence of negative affective states initiates a sequence of events that increases the risk for relapse. |
| | 4 | Negative affective states secondary to gambling problems create a vicious circle where repeated relapse is likely. |
| Cognitions | 5 | Cognitions can directly and indirectly increase or decrease the intensity of the urge to gamble and the likelihood of relapse. |
| | 6 | The increasing arousal associated with an urge to gamble initiates a process of illogical cognitions about winning and a suspension of critical thinking about anticipated gambling resulting in relapse. |
| Urge | 7 | Treatment that effectively manages the urge will lead to the return of critical thinking processes and reduce the risk of relapse. |
| | 8 | There is a sequence of mental events involving the urge to gamble that increases or decreases the intensity of the urge, arousal and the risk of relapse. |
| | 9 | The intensity of urge and physiological arousal fluctuates over time. |
| | 10 | Urge extinction is the most effective in reducing the risk for relapse. |
| | 11 | The intensity of the urge or physiological arousal becomes such that cognitive functions become affected. |

| | | |
|---|---|---|
| Social support | 12 | All positive social support acts to reduce the vulnerability to relapse. |
| | 13 | Relationship disharmony and negative social support can trigger relapse. |
| Interventions | 14 | Interventions based on a belief in supportive approaches leads to a reduction in relapse. |
| | 15 | Motivation of a client to complete treatment reduces relapse. |
| | 16 | Urge exposure and response prevention based on the belief that gambling is a conditioned behaviour demonstrates that it can be treated to urge extinction and mastery of the urge, at which time relapse is reduced or eliminated. |
| | 17 | Interventions based on the belief that gambling is an addiction affect people for life. |
| | 18 | The lifelong ongoing maintenance of vigilance is central to management of problem gambling for as long as the urge to gamble is present so that cognition remains in tact and the risk of relapse is reduced. |

Eighteen hypotheses were generated to explain the relationships seen within each of the 6 principal factors involved in relapse by constant, comparative analysis. These hypotheses describe a process of relapse as follows:

The process is initiated by means of external environmental (H1) or by internal affective triggers (H3), which may be precipitated by negative social conflict that evokes negative affects (H13). This initiates a sequence of mental events and behaviours which may lead to relapse (H8) and is modified by a number of factors which "push" the sequence towards relapse (H2, H4, H5, H6, H11, H17). There are also a number of factors which act to "pull" the sequence away from relapse (H7, H10, H12, H14, H15, H16 and H18,). The final hypothesis describes the fluctuating cognitive, physiological and emotional state of the problem gambler during relapse where the "push" and the "pull" are involved in an approach–avoidance conflict in respect of the urge to gamble (H9).

This final synthesis summarises the results in a single overarching hypothesis.

*Relapse comprises a sequence of mental events and behaviours which evolves over time during each relapse episode, which is modified by factors that "push" this sequence towards, and others that "pull" problem gamblers away from, relapse in their gambling behaviours.*

This is discussed using three diagrams to show: the initiation of the relapse process; the risk factors that together "push" the problem gambler towards relapse and the risk factors that together "pull" the problem gambler away from relapsing. It is described in this way in order to clarify the process where all these risk factors act concurrently in a complex, highly specific and unique way for each problem gambler.


## 5.1 The relapse process: initiation of relapse

This is shown in Figure 3 which shows basically a three step process of initiating perceptions, affects or triggers that lead to awareness, thoughts and urge to gamble The initiation of a sequence of mental events resulting in relapse was complex and began with the presence of a cue to gamble (see Figure 2). The cues were identified as either common to most participants, such as financial difficulties, or as highly specific to some individuals, consistent with conditioning. They seemed to fall into two categories: those arousing positive thoughts and feelings as shown in the box on the left and those starting as negative thoughts and feelings, shown in the box on the right. All the elements listed in both the boxes were derived from the statements made by participants in the focus groups who linked

these triggers to thoughts about gambling. In the former they aroused excitement, thoughts of winning and the urge to go to gamble. In the latter they also aroused thoughts of winning, by shifting the gambler's awareness from the unpleasant initiating situations, thoughts and feelings. Thus there were three steps in the initiation of a relapse event: an enticing or aversive trigger mediated by the problem gambler's emotional response to the trigger, ending at the point where thoughts about and the urge to gamble is aroused and becomes the focus of attention of the problem gambler.

**Figure 2. Initiation of a sequence of mental events resulting in relapse – The "push" towards relapse.**
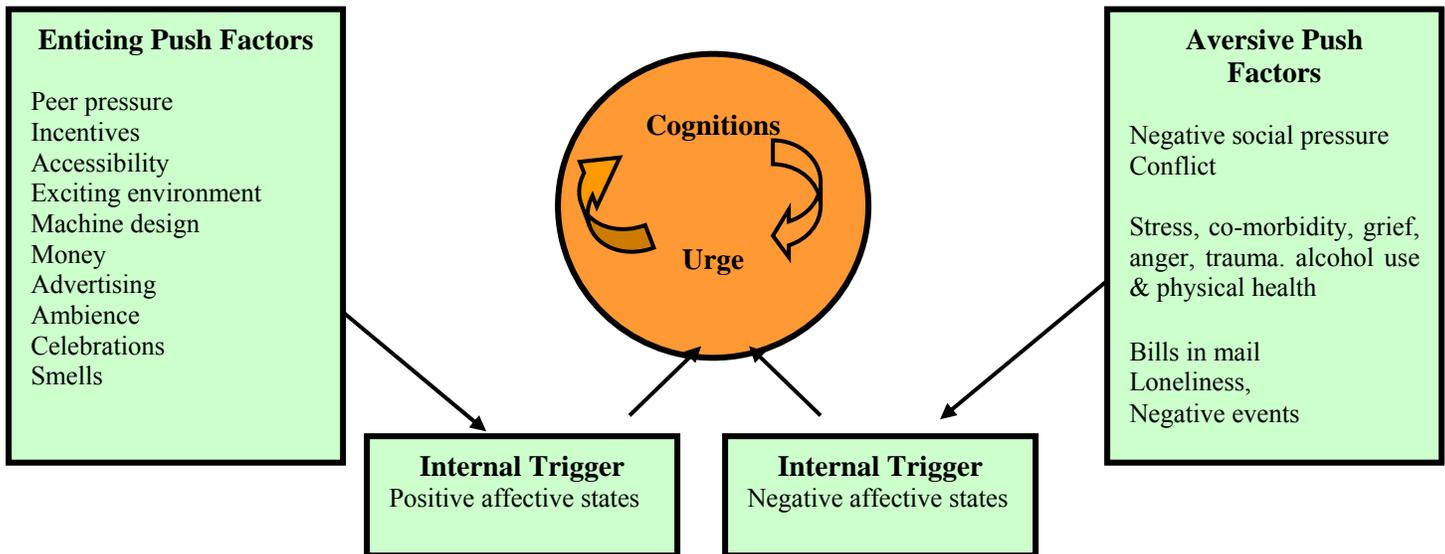


### 5.1.1 Cognitions and urges: the key facilitators that "push" the relapse process

Once cognitions about the benefits of gambling had been initiated in the problem gambler, they were difficult to separate from the urge to gamble as these appeared to reinforce one another almost instantaneously resulting in increasing arousal for the problem gambler. This process is shown in Figure 2 where they are represented as cyclically reinforcing each other at the centre of the diagram and the awareness of the problem gambler. At this point of the process, relapse has started but is not yet irreversibly established.

Once any trigger initiated erroneous cognitions relating to the outcomes of gambling these acted as powerful stimuli for the rise of the urge to gamble, which was accompanied by increasing cognitive, affective and autonomic arousal. Information processing biases related to an overestimation about the possibility of winning added to the risk of relapse. Magical thinking in relation to gambling and the excitement associated with this thought made gambling difficult to resist as the concomitant urge increased in intensity. Some gamblers became preoccupied with the anticipation of the next gamble and thoughts of acquiring money to keep gambling.

The compulsive desire to engage in gambling behaviour (urge) was a critical factor in relapse. Different types of cues to gamble interacted together or on their own to trigger an urge to gamble. The range of cues that precipitated a desire to gamble included specific events, emotional states, life events, money and sensory perceptions. In some cases cues appeared to be highly specific (e.g. smells) while others identified environmental cues that were shared by others. The intensity of the urge to gamble was described as overwhelming and difficult to resist by many participants, and the stronger the urge the more erroneous cognitions that were associated with the urge.

**5.1.2 Cognitions, urge, arousal and decision making: the decision to relapse**

The relationship of urge and the concomitant autonomic, mental and physical arousal that was described by participants seemed to be in parallel with the level of excitement that the gambler was experiencing at the time. This interaction of thoughts, urge and arousal appeared to be the next specific and important feature of the relapse process for problem gamblers: a process of increasing cognitive distortion leading to erroneous decision making. These erroneous cognitions are shown at the top of Figure 3 "pushed" along by the urge and the excitement of anticipated winning. This positive reinforcement loop results in increasing autonomic and cognitive arousal. This is shown by the arrows, acting on the process from right to left in the diagram. In the figure it appears to be different stages, but in fact it is an internal progressive wind-up of increasing arousal until a critical point was reached for each problem gambler when the decision to gamble was made. The decision to relapse seemed to be made to reduce very high levels of arousal of problem gamblers when the temptation to gamble was triggered within them. For some this was an immediate, uncontrollable urge that could not be resisted and had to be immediately satisfied. For others the decision could be made to relapse, but to defer the gambling behaviour. For others again a struggle was initiated between "push" and "pull" factors in a classical approach-avoidance conflict that often culminated in relapse behaviour. At that point, or just before the decision was made, some participants described experiencing an altered state of consciousness; the "zone". This is shown as the red circle at the left of the diagram designating the end point where the problem gambler is firmly entrenched in this lapse episode.

Figure 3. The sequence of events that occurs in the process of relapse.
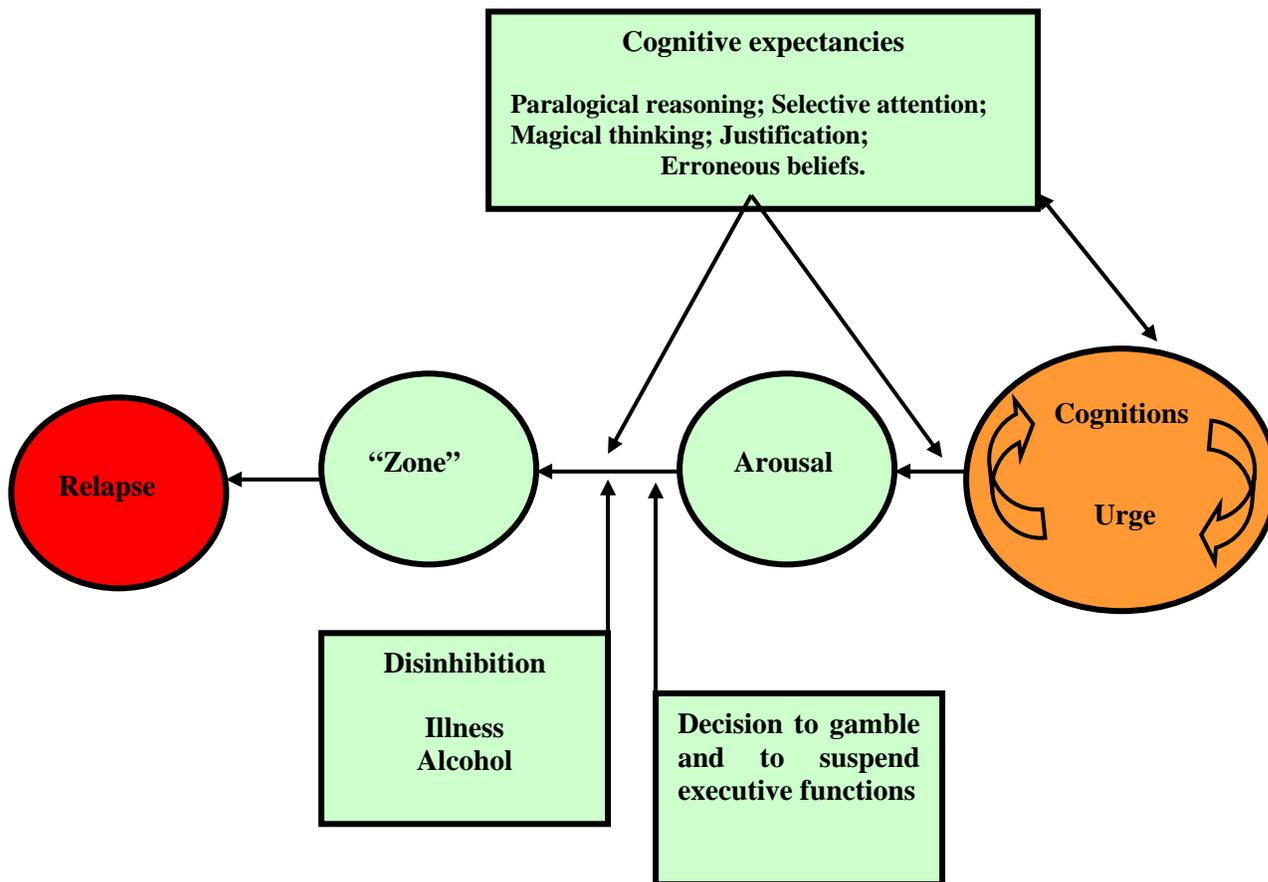
### 5.1.3 The "zone": the lapse or relapse state; perpetuation of relapse and aggravation of harm

Once the decision to gamble was made this seemed to alter the problem gambler's cognitive functions: they seemed to no longer be able to engage in self-observation, critical thinking and accessing memories of negative consequences of gambling, or to exercise the will in respect of gambling cognitions, urges and behaviour. This state of mind was described by participants as "the zone", from which it appeared to be difficult to exit except by running out of financial resources, immediately perpetuating the relapse and aggravating harm.

### 5.1.4 The "pull" factors away from relapse

The second part of the process is described as the "pull" from relapse (see Figure 4). Factors that "pull" problem gamblers away from relapse included treatment interventions and beliefs, cognitive factors, avoidance, distraction, memories, fear and images of previous negative consequences and positive social support. These "pull" factors appeared to influence the progression of the sequence of mental events at different stages of the relapse process. They are shown at the top of Figure 4: positive social support and bettering relationships were clearly important for many participants. Also important were positive thoughts, self-efficacy, drawing strength from others or a higher power, i.e. positive cognitions about not gambling, memories and thoughts about the harm that had been done to others in the past, shame, guilt and promises made and broken, i.e. negative cognitions about further gambling. Finally there were a wide range of strategies that participants used, having learned them themselves or having gained such insights and skills from treatment or self-help agencies, i.e. behavioural strategies and interventions describe these influences as a group.

### 5.1.5 Maintaining vigilance

The central issue in these protective factors in a high risk situation or threat of lapse or relapse was the capacity to remain vigilant at all times, knowing that relapse could occur at any time. This is shown as the mediating variable in the diagram and was part of much counselling and relapse prevention and the twelve step philosophy and approach to managing problem gambling.

All these protective factors are operating throughout the relapse crisis prior to the decision to gamble has been made. This is shown in the diagram by the arrows along the line going to the left and the point of lapse or relapse or ongoing abstinence.

Figure 4. Managing problem gambling: the "pull" from relapse.
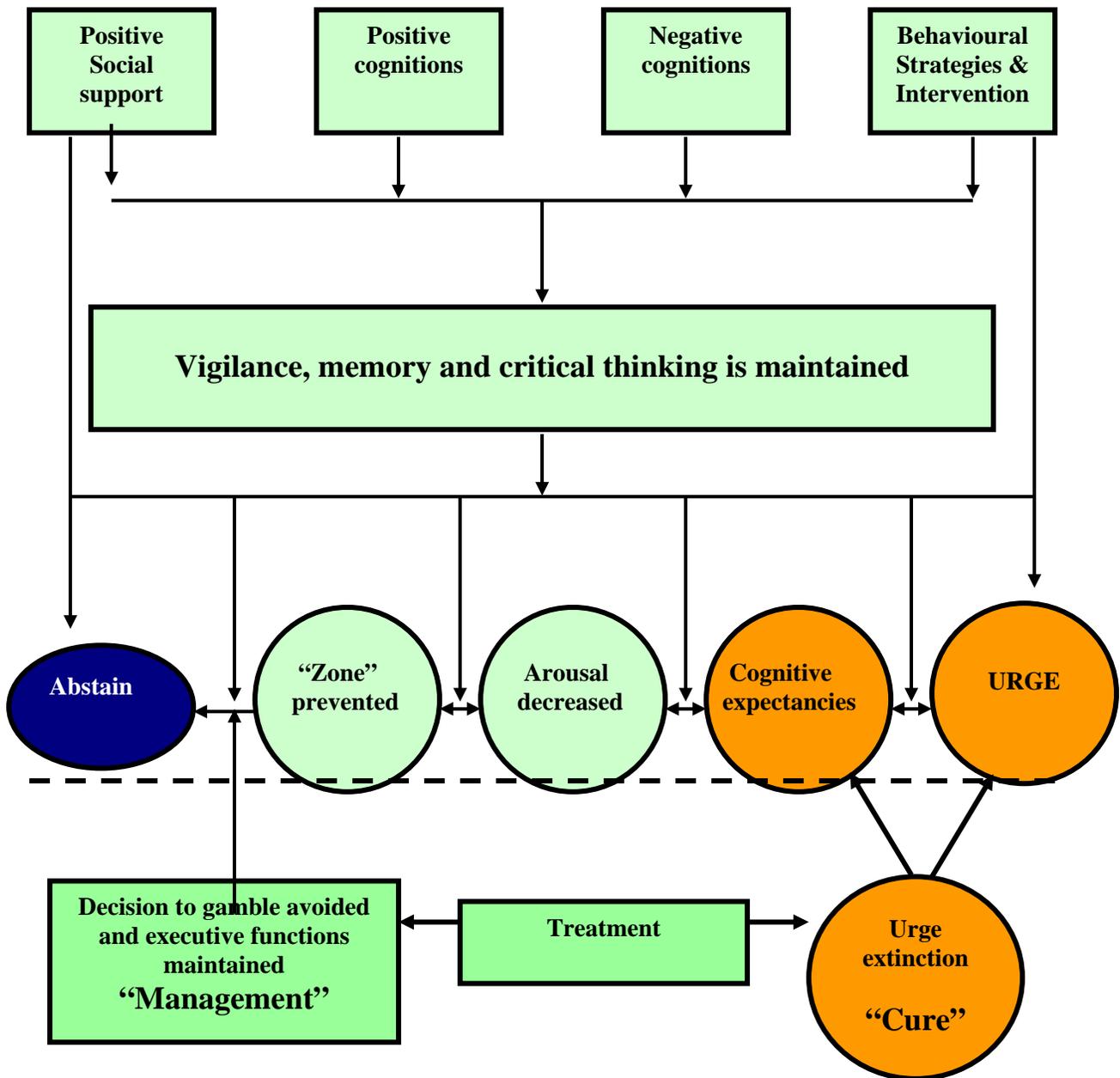


The central factor associated with these pull factors was the ability of the gambler to remain vigilant about the possibility of relapse, have a memory of negative events, to sustain the capacity to think critically, to self-monitor and to continue to take the responsibility for rational decision making. "Pull" factors appeared to act by decreasing the level of excitement and arousal by means of retaining an objective mindset of "vigilance". "Pull" factors appeared to act on the sequence of events by helping the gambler to prevent the interactions between the urge and cognitions, which seemed to reduce the increasing levels of arousal.

Participants provided evidence for each of the above factors, but each individual appeared to exhibit their own particular pattern of relapse or prevention of relapse.

### 5.1.6 "Management" or "cure"

Extinction of the urge to gamble seemed to eliminate the relapse process for some suggesting the possibility of "cure". This is shown by the hatched line below which treatment is inscribed. There appeared to be two fundamentally different ways of trying to manage relapse: relapse prevention and management by maintaining vigilance and avoiding getting caught up in the process of relapse or by confronting the urge by graded exposure and response prevention which appeared to result in the extinction of the urge with the confidently asserted belief by those participants that they no longer had a problem. This claim of "cure" needs to be examined further and tested. This specific form of treatment is also shown on the right hand side of the diagram acting specifically on the circle with the mutually reinforcing urge and cognitions are specifically treated.

### 5.1.7 Culturally specific relapse as a group

The one example of an Indigenous community engaging in gambling during their grieving was quite different from all the other reports, and it was not clear if the observed sequence of mental and behavioural events applied for this group. During community grieving for the loss of a 15 year old member the community relapsed. It was unclear how this came to be. This relapse process may have been exacerbated by restrictions placed upon these people; the only place they could socialise was in a gaming environment, which increased risk for a gambling relapse. No conclusions can be drawn from this limited evidence. Further research may discover the factors involved in gambling relapse for the members of Indigenous communities.

## 5.2 The findings

The findings of this study must be considered to be of a preliminary nature, however it is one of few qualitative studies into gambling relapse (see section 2 and Smout et al., 2008). It is the only study to specifically explore the factors that initiate, perpetuate and impede the process of relapse in problem gambling. It also describes the cognitive processes during relapse that results in the choice of illogical behaviour over and above a consciously stated desire to stop gambling. The focus group methodology has served as a valuable tool in eliciting rich and detailed data concerning these predictors of relapse. The validity and reliability of the findings from this study was maximised by using a structured format and auditing the research process (see Appendix 5 for the audit report).

The most important finding in this qualitative study on relapse risk in problem gambling was that *There is a sequence of mental events that occurs in gambling relapse behaviour which is modified by a "push" towards and a "pull" away from relapse.* This report has described this process in detail, and as such is the first qualitative study to empirically describe this phenomenon.

Successful completion of urge exposure treatment was identified as an effective treatment to overcome the risk of relapse in the long term. Treatment that enabled extinction of the urge to gamble stopped the sequence of relapse commencing.

From their reports, gamblers do not relapse when exposed to gambling triggers if the urge to gamble has been mastered or extinguished. This is based on a belief expressed by some participants that gambling is a conditioned behaviour that can be treated to eliminate the urge. Treatment appeared to be differentially effective in managing the urge to reduce relapse. When treatment does result in the gambler effectively managing the urge, critical thinking processes will return, thus reducing the risk of relapse and the need to maintain vigilant strategies for managing the push towards relapse. The interaction between cognitions and the urge ceases, and both critical thinking and the ability to self-observe returns.

## 5.3 Summary

The extinction of the urge to gamble as a treatment outcome provided significant resilience against a relapse back to gambling in the long term. The support of significant others in the process of recovery is important and enabled clients to increase their self-esteem and overcome the negative consequences related to past gambling behaviour, such as guilt and shame. Coping skills were identified as important to increase the resilience of clients in treatment or using management techniques. For some problems gamblers managing the predictors of relapse with a positive support network enabled them to reduce the risk of relapse.

## 5.4 Limitations of the study

There are a number of important limitations of the study. Firstly it is an exploratory study with small numbers of subjects, and as such generalisability is clearly limited (section 3.1). Qualitative researchers use purposive sampling, as in this study. The researchers used a representative framework for the therapies and sources of accessible problem gamblers and gambling service providers in South Australia. However, there are alternative specific therapies other than CBT with an emphasis on urge exposure and response prevention, as was the case for 2 of the 4 groups of participants. There are other service provision models such as SMARTRecovery, which involves a self-help and mutual support for gamblers who may struggle with the twelve-step, disease approach from which the findings from a similar Focus Group Study may provide further or different data about the relapse process. As subject selection and recall bias are frequent limitations in qualitative studies, alternative methodology will need to test whether the hypotheses stand such scrutiny.

## 5.5 Future directions

*Is it possible to achieve apparent "cure" by treatments other than urge exposure and response prevention?*

There was one participant from the NGO group who had also achieved what seemed to be the same sort of "cure" as those from the SGTS group without having had exposure therapy. Further focus groups should therefore be conducted. The researchers suggest replication of this study with wider groups of participants, including the following, in order to address this selection bias and increase the generalisability or "truth value" (Guba, 1981) of these findings:

- Clients receiving a variety of CBT strategies, including cognitive therapy alone, which focuses upon different aspects of relapse
- Non treatment seeking problem gamblers
- Aboriginal and CALD clients exploring the presence of cultural factors in the context of relapse
- Problem gamblers with co-morbid mental health disorders and personality traits such as impulsivity, sensation-seeking, disinhibition and susceptibility to reward. It was surprising in the light of these factors being identified as major risk factors in the Literature Review that they did not emerge as such in this study.

*Is this sequence of mental and behavioural events true for all episodes of relapse to problem gambling?*

These questions were also raised in this study:

- What is the sequence of mental events that either "pushes" a client to relapse or "pulls" a client from relapse?

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- Are these behavioural sequences conditioned responses as a whole, as the distant decisions to relapse did not appear to be accompanied by tortured, vacillating cognitions which appeared to be "a losing battle" for some others?
- What is the nature of the apparent altered psychological set and the altered state of consciousness once the decision to gamble has been made and what interventions could be developed to address this?
- Does heightened arousal per se precipitate a "state conditioned response" where tension relief conditioning results only when the problem gambler relinquishes critical thinking, adopts cognitive bias and relinquishes the recall of previous negative consequences of gambling exercise of the will, placing money in the machine and pressing the buttons?
- What is the nature of the altered psychological state which gamblers describe? Livingstone et al. (2008) also described this "unthinking" mode of EGM gambling as "the zone" or getting into "the zone", which they saw as enabling dissociation from life stresses (Livingstone, Woolley, Zazryn, Bakacs, and Shami, 2008).
- What brings a gambling relapse to a close? Are there ways in which a relapse can be interrupted to re-institute these mental faculties without having to wait for the problem gambler to run out of funds, which appeared to terminate this altered state of consciousness? For example, it could be possible for gaming machines to monitor patterns of gambling behaviour. It may be possible for the machine to be programmed to display a warning message asking the user to review his/her use of the machine at this time, at the same time providing the information that the pattern of use was such that there may be a gambling problem. Such a "pop up" sign, generated by the machine, could possibly interrupt the altered state of consciousness described as "the zone", limiting the relapse episode. There is recent evidence for video lottery machines that such interventions can be successful (Cloutier, Ladouceur, and Sevigny, 2006).

## 5.6 Implications

The limitations and findings of the study suggest:

- Further understanding is needed to explore the hypothesis that "there is a sequence of mental events that occurs in gambling relapse behaviour which is modified by a 'push' towards, and a 'pull' away from, relapse."
- The sequential mental events described in this study shared a common path and process, but seemed to have many separate individual variations. Blaszczynski and Nower (2002) have addressed this issue, suggesting that there are three separate pathways in the development of problem gambling behaviour. The findings in this study appear to complement aspects of the pathways proposed. However, the findings also suggest that those pathways may be far more complex than is understood.
- The study also suggested that there was a very close relationship between cognitions and the compelling urge to gamble. The urge and the arousal associated with it also seemed to intensify increasingly, the closer the point of relapse behaviour came to be.

## 5.7 Implications for treatment

### 5.7.1 Treatment which focuses on the elimination of the urge

Extinction of the urge to gamble provided the client with the strong resilience against relapse for 4 of the 5 problem gamblers, supported by their significant others, who reported that there was no longer any problem when they were in the presence of what previously had been irresistible temptations for them.

This suggests that urge reduction/extinction therapy should be examined against other therapies to test the hypothesis that urge exposure and response prevention has a significantly lower relapse rate than other therapies.

### 5.7.2 Approach-avoidance conflict during the relapse process

A significant number of participants described a tortured period during the relapse process when they agonised about relapsing or not. Most often the "push" cognitions would overcome the "pull" cognitions. This process of clients making the choice to gamble appeared to result in the experience of an intense approach-avoidance conflict for some participants. Further research on the decision making processes at this time of intense internal conflict may help in the understanding of this apparently inevitable progression towards a gambling relapse.

This situation may also lend itself to a further intervention that combines recognition of the sequential process involved in relapse, resistance of the urge and the need to escape from the urge as espoused by a mindfulness and acceptance and commitment model of therapy.

### 5.7.3 Avoidance and abstinence as effective management

Other management techniques were also identified as effective for problem gamblers. These strategies had been taught to those who preferred to manage their gambling problems with strategies that limited the risk of relapse. Financial counsellors and relationship counsellors provided a valuable service that enabled clients to develop effective strategies to manage the risk factors of relapse, such as financial stress and relationship disharmony. However, these clients needed to be vigilant at all times and in all situations that posed a potential risk of relapse.

The role of peer support was also important for many problem gamblers, as this support enabled problem gamblers to manage their behaviour by means of fear, vigilance at all times and placing their confidence in "a higher power" to maintain their level of critical thinking, motivation to remain abstinent and to continually exercise the will to avoid risk.

### 5.7.4 The management of co-morbidity with problem gamblers

It could be argued that a mental health assessment needs to be carried out with all problem gamblers (Kim, Grant, Eckert, Faris, and Hartman, 2006), as many such patients suffer from depression. Antidepressants for psychological treatments should be used as needed to treat depression (Zimmerman, Breen, and Posternak, 2002; www.BeyondBlue.org.au).

The providers of client services such a financial counsellors, non-government organisations, relationship counsellors, mental health teams and general practitioners all contributed to assisting some participants. It was found that these issues were often not the primary reason for the relapse episode. Rather, it was the way that these problems created a mental set characterised by negative feelings and self-critical cognitions that created risk. These negative affects then triggered the urge to gamble and positive "push" gambling cognitions. From first principles, these interventions need to include evidence-based therapies such as cognitive therapy to deal with negative affective states (De Rubeis, Siegle, and Hollon, 2008), and behavioural interventions such as behavioural activation (Jacobson et al., 1996) with coping skills training (Jacobson et al., 1996).

Clearly relationship counselling, or cognitive therapy for such negative cognitions may reduce the frequency of such negative affective states, though the overwhelming damaging issues associated with problem gambling seemed to negate any therapy whenever relapses ensued.

Marital or relationship conflicts were described as almost universally present, which has been found in other studies (Griffiths and Macdonald, 1999). Again in these instances the negative affects generated

by these problems served to trigger the urge to gamble. There were also a number of examples amongst participants of dysfunctional relationships where couples clearly sabotaged one another to perpetuate gambling problems. This has also been described in the literature (Moos, 2007), and it is clear that such dyads need to be treated as a couple.

Participants described the need for encouragement and support by their significant others or peers during the recovery process in order to successfully progress through treatment or to utilise appropriate management strategies to prevent a relapse. Support groups were used by many participants. The therapeutic benefits of all support included: focussing on the negative consequences of gambling, the avoidance of relapse situations and the importance of remaining vigilant during the recovery process.

Whilst not denying the importance of these "pull" strategies, they were described as requiring substantial effort that needed to be sustained indefinitely. In comparison to the reports by those participants who had confronted the urge to gamble systematically, these efforts appeared to be less efficacious and cost effective.

### 5.7.5 Cognitive therapy for gambling relapse

The sequence of mental events suggested is a preliminary hypothesis to help provide the construction of a descriptive and explanatory framework for relapse back to gambling. This hypothesis shares similarities with the three subgroups of the proposed pathways model into problem gambling (Blaszczynski and Nower, 2002).

Walker (1992) suggests that irrational thinking maintains gambling behaviour, which is also present in the sequence of mental and behavioural events described by the participants in this study. Whilst there has been selection bias in this study, it is representative of problem gambling services in South Australia. Nevertheless, further work is required to test if this hypothesis can be sustained when other therapies, workers and significant others are interviewed in the same way. Is the proposed sequence of mental events described in this study consistent for all gamblers exposed to other interventions? And can this sequence of mental events be interrupted in ways other than urge exposure and response prevention, such as correcting irrational beliefs? The sequence of mental events also has some discontinuous features and a high degree of individual variability.

### 5.8 Conclusion

This study demonstrates a sequential process that leads a problem gambler to relapse into gambling behaviour. It is the first qualitative study to empirically describe this phenomenon. There is an apparently strong relationship between cognition and the urge to gamble, which should be further explored. Successful completion of urge exposure treatment was identified as an effective treatment to overcome the risk of relapse in the long term. Treatment that enabled extinction of the urge to gamble stopped the sequence of relapse commencing. Social support was also named as important in preventing relapse for problem gamblers. Development of future treatment methods could benefit from incorporating and further investigating these findings. This study begins to uncover the sequential nature of relapse into gambling. Further study as suggested will further understanding of this phenomenon.

# GLOSSARY

**Abstinence** is a conscious decision not to engage in addictive behaviours such as using drugs, alcohol or engaging in gambling.

**Affect** is a general term for feelings, emotion, or moods.
Positive affective states include emotions such as enjoyment, joy and excitement.
Negative affective states include emotions such as anger, rage disgust, shame, humiliation, sadness, depression and distress.

**Attention** is partly an automatic process, and central to perception and consciousness, it is the first step in processing a message.

**Classical conditioning** is when a neutral stimulus acquires the capacity to elicit a response originally elicited by another stimulus.

**Coding** breaks a text from a transcript down to manageable segments. Open coding is conceptualising on the first level of abstraction from field notes or transcripts. These codes are conceptualised line by line. Axial coding is where categories identified are refined, developed and related.

**Cognitive processes** are a higher mental process such as perception, memory, language, problem solving, and abstract thinking.

**Cognitive therapy** is a type of psychotherapeutic treatment that attempts to change feelings and behaviours by changing the way a client thinks about or perceives significant life experiences.

**Co-morbidity** is the experience of more than one disorder at the same time.

**Conditioning** is the way in which events, stimuli, and behaviours become associated with one another.

**Cue** is a formerly neutral stimulus that acquires the ability to elicit craving through classical conditioning.

**Urge Exposure Therapy (gambling)** is a specific therapy approach used at the SGTS enabling clients to slowly confront and extinguish their urge to gamble. It is based on the principles of learning such as classical and operant conditioning.

**Craving** is "a subjective" desire to experience the effects of the consequences of a given act.

**Decision making** is the process of choosing between alternatives and selecting or rejecting available options.

**Disinhibition** is a term used to describe conditions of a person being unable (rather than disinclined) to control their immediate impulsive response to a situation.

**Dissociation** is the splitting off a mental process into two separate, simultaneous streams of awareness. For example people may not remember engaging in particular behaviours.

**Dissociative disorder** is a cognitive state marked by a disturbance in the integration of identity, memory, or consciousness.

**Environmental variables** are external influences on behaviour.

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**Expectancy theory** is a cognitive theory of motivation that proposes that people are motivated when they anticipate their efforts and performance to result in desired outcomes.

**Executive function** is a set of cognitive abilities that control and regulate other abilities and behaviours.

**Extinction** in conditioning is the weakening of a conditioned association in the absence of a reinforcer or unconditioned stimulus.

**Generalisability** refers to the extent that findings in one situation can be transferred to another.

**Grounded theory** is a systematic generation of theory from data that contains inductive and deductive thinking.

**Hypothesis** is a tentative and testable explanation of the relationship between two (or more) events or variables; often stated as a prediction that a certain outcome will result from specific conditions.

**Habituation** in psychology is the psychological process in humans and animals in which there is a decrease in behavioural response to a stimulus after repeated exposure to that stimulus over the duration of time.

**Illusion** is an experience of a stimulus pattern in a manner that is demonstrably incorrect but shared by others in the same perceptual environment.

**Incentives** are external stimuli or rewards that motivate behaviour.

**Inhibition** is the opposite of facilitation and refers to a mental state in which there is a hesitation or blockage of action.

**Learning** is a process based on experiences that result in a relatively permanent change in behaviour or behavioural potential.

**Motivation** is the innate or acquired drive that stimulates behaviour, and that may be negatively originated to solve or avoid a problem (for example) or positively originate for sensory gratification or social approval.

**Operant conditioning** is a form of learning. For example a behaviour is strengthened (occurs more frequently) when followed by reinforcement, and weakened (occurs less frequently) when followed by punishment. When an individual is reinforced for doing something, they are more likely to do it again. When an individual is punished for doing something, they are less likely to do it again. Therefore behaviour is influenced by the consequences that follow it.

**Preoccupation** is when a person becomes totally absorbed in their addiction. Their usual activities and relationships are overtaken by thoughts about engaging in the addictive behaviour and planning the next occasion they can participate in the activity.

**Pain** is the body's response to noxious stimuli that are intense enough to cause, or threaten to cause, tissue damage in its consequences.

**Paralogical reasoning** is an error in reasoning whereby reasoning is flawed in its logic or form and contradicts logical rules. Therefore the individual's reasoning is faulty or illogical, but superficially it appears to be reasonable.

**Perceived control** is the belief that one has the ability to make a difference in the course or the consequences of some event or experience.

**Perception** is a process that organises information in the sensory image and interprets it as having been produced by properties of objects or events in the external, three dimensional world.

**Personality disorder** is a chronic, inflexible, maladaptive pattern of perceiving, thinking, and behaving that seriously impairs an individual's ability to function in social or other settings.

**Positive reinforcement** is a process of increasing the likelihood of a response by immediately following the desired response with a desirable stimulus or reward.

**Posttraumatic stress disorder (PTSD)** is an anxiety disorder characterised by the persistent re-experience of traumatic events through distressing recollections, dreams, hallucinations, or dissociative flashbacks. These symptoms develop in response to life-threatening events such as rapes, severe injuries, and natural disasters.

**Problem solving** is thinking aimed at solving specific problems and moves from an initial state to a goal state by means of a set of mental operations.

**Reasoning** is the process of thinking in which conclusions are drawn from a set of facts; thinking directed toward a given goal or objective.

**Reinforcer** is a term used in operant conditioning to describe any event that strengthens the frequency of the behaviour that immediately precedes it.

**Reliability** is the degree to which a test produces similar scores each time it is used.

**Sample** is a subset of a population selected as participants in an experiment.

**Schedules of reinforcement** in operant conditioning are the patterns of delivering and withholding reinforcement.

**Self-awareness** is the top level of consciousness; cognisance of the autobiographical character of personally experienced events.

**Self-concept** is an individual's mental model of his or her abilities and attributes.

**Self-efficacy** is a set of beliefs that one can perform adequately in a particular situation.

**Self-esteem** is a generalised evaluative attitude toward the self that influences moods and behaviour and that exerts a powerful effect on a range of personal and social behaviours.

**Selective attention** refers to the capacity to maintain a behavioural or cognitive set in the presence of distracting or competing stimuli, or a mental set whereby selective bias is given to information that accords with the beliefs held by an individual and the negation of information that contradicts those beliefs.

**Sensation** is the process by which stimulation of a sensory receptor gives rise to neural impulses that result in an experience, or awareness of, conditions inside or outside the body.

**Social role** is a socially defined pattern of behaviour that is expected of a person who is functioning in a given setting or group.

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**Social supports** are resources, including material aid, socio-emotional support, and informational aid, provided by others to help a person cope with stress.

**Stigma** is the negative reaction of people to an individual or group due to assumed inferiority or source of difference that is degraded.

**Stress** is the pattern of specific and non-specific responses an individual makes to stimulus events that disturb its equilibrium and exceed its ability to cope.

**Stressor** is an internal or external event or stimulus that induces stress.

**Subconscious** is the domain of the psyche that stores repressed urges and primitive impulses and acts automatically outside of awareness.

**Theory** is a structured set of concepts that explains a phenomenon or set of phenomena.

**Tolerance** is a situation that occurs with continued use of a drug, for example in which an individual requires increased dosages to achieve the same effect.

**Triggers** are formerly neutral stimuli that have attained the ability to elicit for example drug craving following repeated pairing with drug use.

**Urge** is a relatively sudden impulse to engage in an act.

**Validity** is the extent to which a test measures what it was intended to measure.

**Zone** is an altered state of cognitive functions when the gambler is no longer able to engage in: self-observation, critical thinking, accessing memories of negative consequences of gambling and to exercise the will in respect of gambling cognitions, urges and behaviour.

# APPENDIX 1. LETTER OF INTRODUCTION

Dear …………

We hold the positions of Project Officer and Cognitive Behaviour Psychotherapist in the Flinders Therapy Service for Problem Gamblers, Department of Psychiatry, Flinders University.

We are part of a team with the service undertaking research leading to the production of a project report and other scientific publications on the subject of predictors of relapse in problem gambling. Research outcomes will include a model explaining the processes of relapse. The project is funded by the Victorian Department of Justice. We would be most grateful if you would volunteer to spare the time to assist in this project, by participating in a focus group to develop key themes of reasons for relapse. Participants in the group will consist of clinicians affiliated with the Flinders Therapy Service for Problem Gamblers. No more than two hours on one occasion would be required and will include a provided lunch. Attendance at this focus group is voluntary. If you wish you may attend a further session about the results. Be assured that any information provided will be treated in the strictest confidence and none of the participants will be individually identifiable in the resulting report or other publications. You are, of course, entirely free to discontinue your participation at any time or to decline to answer particular questions.

Since we intend to make a tape recording of the interview, we will seek your consent, on the attached form, to record the interview, to use the recording or a transcription in preparing the report or other publications, on condition that your name or identity is not revealed, and to make the recording available to other researchers on the same conditions.
Any enquiries you may have concerning this project should be directed to us at the address given above. We will contact you soon to discuss further details including a convenient time and location.

Thank you for your attention and assistance.


Yours sincerely,



David Smith (Project Officer)          Jane Oakes (Cognitive Behaviour Psychotherapist )
The Flinders Therapy Service for Problem Gamblers
This research project has been approved by the Flinders University Social and Behavioural Research Ethics Committee. The Secretary of the Committee can be contacted by telephone on 8201 5962, by fax on 8201 2035 or by email sandy.huxtable@flinders.edu.au.

# APPENDIX 2. CONSENT FORM FOR PARTICIPANTS

(by focus group participants)

I …...............................................................................................................
being over the age of 18 years hereby consent to participate as requested in the letter of introduction for the research project on relapse in problem gambling.
I have read the information provided.
Details of procedures and any risks have been explained to my satisfaction.
I agree to my information and participation being recorded on tape.

4.  I am aware that I should retain a copy of the Consent Form for future reference.

5.  I understand that:

I may not directly benefit from taking part in this research.
I am free to withdraw from the project at any time and am free to decline to answer particular questions.
While the information gained in this study will be published as explained, I will not be identified, and individual information will remain confidential.
I may ask that the recording be stopped at any time, and that I may withdraw at any time from the session or the research without disadvantage.

6.  I agree/do not agree* to the tape/transcript* being made available to other researchers who are not members of this research team, but who are judged by the research team to be doing related research, on condition that my identity is not revealed. * delete as appropriate

Participant's signature…………………………………Date…………………...
I certify that I have explained the study to the volunteer and consider that she/he understands what is involved and freely consents to participation.
Researcher's name…………………………………….…………………….
Researcher's signature…………………………………..Date…………………….

NB. Two signed copies should be obtained. The copy retained by the researcher may then be used for authorisation of Item 7.

7.  I, the participant whose signature appears below, have read a transcript of my participation and agree to its use by the researcher as explained.

Participant's signature…………………………………Date…………………...

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# APPENDIX 3. FOCUS GROUP GUIDING QUESTIONS

These were the guiding questions that were used in each of the focus group discussions and were used as a prompt by the facilitators.

What is a relapse and lapse in problem gambling?

What are some indicators of relapse? Examples:

Reasons for relapse in problem gambling

The question set focuses on gathering information at four levels.

A. Psychological factors (cognitive, affective, personality);
B. Psychobiological factors;
C. Social and environmental factors; and
D. Treatment modalities.

Examples of the themes asked in the guiding questions:

- Coping ability with stressful situations?
- Cognitive errors, e.g. illusion of controlling gambling?
- Personality constructs, e.g. impulsivity?
- Environmental cues on physiological reactions, e.g. lights, sound, cigarette smoke?
- Demographic factors, e.g. number of venues in gamblers environment
- Social support characteristics, e.g. accepted gambling behaviours amongst family and friends or a lack of social networks?
- What intervention modalities has the participant engaged in, e.g. CBT, behavioural, pharmacological, self-directed?

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# APPENDIX 4. CHARACTERISTICS OF THE FOCUS GROUP PARTICIPANTS

## STATE WIDE GAMBLING THERAPY SERVICE WORKERS

This group comprised 11 expert clinicians in the areas of CBT who had worked at the SGTS; all were graduates of the Mental Health Sciences Postgraduate Programs at Flinders University specialising in CBT; nine had achieved the Masters Degree.

### Mental Health Sciences postgraduate programs

The Flinders University postgraduate programs in mental health sciences provide opportunities for people from mental health backgrounds to enhance their knowledge, skills and attitudes in the area of mental health sciences. The course aims to equip graduates from a variety of health professions with profound knowledge and understanding of the theory, principles and practice of mental health sciences with an emphasis on Cognitive-Behavioural Therapy (CBT). This focus group provided information from trained workers who specialised in CBT using cue exposure and response prevention. These workers have assessed clients with gambling problems, provided evidence-based treatment and follow up as required. Significant others are also encouraged to participate in the treatment program at the State wide Gambling Therapy Service (SGTS). These workers had extensive experience in the area of problem gambling. The therapeutic program used at the SGTS is a cognitive behavioural therapy which is holistic with an emphasis on exposure therapy (ET) and response prevention (Oakes et al., 2008). This program enables clients to slowly confront and extinguish their urge to gamble rather than using avoidance or distraction techniques to manage their urge to gamble. The aim is to enable the client to return to a fully functional lifestyle when the urge to gamble has been extinguished.

Cognitive therapy techniques are used to help clients challenge their erroneous beliefs about gambling to correct cognitive errors, the illusion of control and their belief in luck. Cognitive therapy is also used to help clients address their negative thought processes that can maintain a depressed mood. Clients are also taught problem solving strategies, coping skills, daily activity scheduling and relapse prevention strategies. Both financial and relationship counselling are also offered to clients.

## SGTS CLIENTS

This group comprised 10 clients and their significant others from rural and metropolitan areas who had been involved with the specific CBT programme offered at the SGTS. The clients were graduates of the SGTS program providing valuable data from their own and their significant others' experiences with gambling related problems and relapse.

## NGO AND OTHER WORKERS

This group comprised 9 workers from non-government organisations and the Gambling Helpline.

*PEACE Multicultural Gambling Help Service (N=1 Social worker)*

This service provides support to the multicultural communities by raising awareness and providing community education and development projects around problem gambling. They provide a range of holistic and flexible services to people from CALD (Culturally and Linguistically Diverse) backgrounds and facilitate partnerships between CALD and non-CALD community service agencies and communities.

*The Gambling Help Line (N=2 Registered nurses)*

The Gambling Helpline is a free SA Government, 24-hour counselling, information and referral service to assist people in South Australia with gambling-related problems, or those affected by the gambling of others, including family members.

*Nunkuwarrin Yunti (N=2; 1 Social worker and 1 financial counsellor).*

This service provides health care and community support services to Aboriginal and Torres Strait Islander people.

*Relationships Australia (N=4; 2 Social workers, 1 counsellor and 1 financial counsellor)*

Relationships Australia is a community-based, not-for-profit organisation providing relationship support to people regardless of age, religion, gender, sexual orientation, lifestyle choice, or cultural or economic background. This organisation offers family and relationship counselling, as well as a range of specialist counselling services. The main counselling services are face-to-face, with some online counselling and telephone counselling for people in rural and remote areas of Australia.

This focus group provided information from a diverse range of cultural and service delivery models including didactic counselling, financial counselling and relationship counselling.

# NGO CLIENTS

*Pokies Anonymous (N= 4)*

Pokies Anonymous is a self-help peer support organisation based on similar principles to AA, although as the name suggests, PA is about helping people abstain from poker machine gambling only. PA has regular meetings in Adelaide that are anonymous and incorporate the 12 Step recovery goals.

*The Client Voice Program (N=2)*

This program provides the opportunity for people who have overcome a gambling problem or been affected by problem gambling, to be trained and supported to share their personal stories on how problem gambling affected them, and their families. All were problem gamblers using Electronic Gambling Machines and two from PA were married to each other. These clients and their partners provided valuable data from their own and their significant others experiences with gambling related problems and relapse. There was a total of 36 participants comprising 11 current or former problem gamblers, 5 significant others and 20 workers from gambling treatment agencies. The 11 problem gamblers comprised 5 clients from SGTS and 4 from PA including one couple and 2 from Consumer voice. The 5 significant others were associated with the SGTS unit. Clients and significant others were represented from rural and urban areas. There were a total of 20 workers, 11 with a cognitive behavioural therapy (CBT) orientation and 9 NGO and referral service workers comprising 3 social workers, 2 nurses, 2 counsellors and 2 financial counsellors including 2 indigenous agency workers.

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Overall it was considered that the groups were representative of the clients and workers as seen in the wider range of services provided for those affected by problem gambling in the South Australia.

Characteristics of focus group participants

| Focus Group | SGTS: Workers | SGTS: Clients and Significant Others | Non Government (NGO) Agency Workers | Clients: Pokies Anonymous (PA) Client Group |
|---|---|---|---|---|
| Number | 11 | 10 | 9 | 6 |
| Male Female | 2 9 | 5 5 | 0 9 | 4 2 |
| Age Range | 30 to 55 | 38 to 60 | 50 to 72 | 45 to 60 |
| Background | Master of Mental Health Sciences Postgraduate Programs Graduates: <br><br>Nurses (N=2) <br><br>Social Workers (N=8) <br><br>Teacher (N=1) | Rural site (N=4) <br><br>Metropolitan site (N=6) <br><br>Client (N=5) <br><br>Significant other (N=5) | Multicultural Gambling Help Service Social Worker (N =1) <br><br>The Gambling Help Line Nurse background (N=2) <br><br>Nunkuwarrin Yunti Social worker (N=1) <br><br>Financial Counsellor/ Indigenous Lived experience worker (N =1) <br><br>Relationships SA <br><br>Graduate Diploma Health Counselling (N=1) <br><br>Social Worker (N=1) CALD Team N=1 Social worker Financial Counsellor (N=1) | Client Voice Program <br><br>Clients (N=2) <br><br>Pokies Anonymous <br><br>Clients (N=4) (1 married couple) |

# APPENDIX 5. RESEARCH AUDIT REPORT

**Research Project:** Predictors of Relapse in Problem Gambling – A Focus Group Study
**Researcher:** Ms Jane Oakes
Auditor:
Dr Sharon Lawn
Senior Lecturer
Department of Psychiatry, School of Medicine
Flinders University
Bedford Park, South Australia
**Date:** 20th October, 2008

## Preamble

I undertook this role as a clinician and academic staff member at Flinders University who is independent from this research and with no clinical relationship to the Gambling Therapy Services at Flinders or any other organisation that provides treatment for gambling problems. I have a sound general understanding of health issues, addictions and mental health issues, having worked in a clinical role within mental health and other health services for more than 20 years and done extensive research on addictions, among other health issues. I also have a sound understanding of research methods, having taught research topics to undergraduate and post-graduate students for the past 8 years and undertaking a broad range of research as part of my academic and clinical roles. I have a sound understanding of research audits, having undertaken an extensive Literature Review of audit processes and developing a rigorous framework for undertaking such audits of qualitative research as part of my own PhD thesis in 2001.

I conducted an audit of the focus group component of Ms Oakes' research in which she was engaged from late August 2007 to mid October 2008. My contact with Ms Oakes consisted of bi-monthly one hour meetings for the duration of the project (8 meetings in total). The first meeting was used to establish the criteria for the audit and familiarise me with the research aims, process of recruitment of participants and methods of data collection. Subsequent meetings involved examination of the process and context of data collection and analysis.

## Supporting Documentation Provided to the Auditor

(1) Literature:

Akkerman, S., Admiraal, W., Brekelmans, M., and Oost, H. (2008). Auditing quality of research in social sciences. *Quality and Quantity, 42*(2), 257-274.

Guba, E.G. (1981) Criteria for Assessing the Trustworthiness of Naturalistic inquiries." Educational Communication and Technology Journal, 29:2, 75-91.

Rodgers, B.L., and Cowles, K.V. (1993). The qualitative research audit trail: a complex collection of documentation. *Research in nursing and health, 16*(3), 219-226.

(2) Research Documents:

Ethics protocol and clearance for the research
Transcripts of Focus Groups
Reflective journal notes

**Audit report**

The main underlying questions for the auditor are whether the results and conclusions are grounded in the process of data gathering and data analysis in a way that the researcher made linkages that are visible (visibility), substantiated (comprehensibility), and logically and scientifically acceptable (acceptability) (Akkerman, Admiraal, Brekelmans, and Oost, 2008). Underlying this process is the 'trustworthiness' of the qualitative findings. This parallels validity and reliability terminology that is applied to research generally, and particularly to quantitative research. Guba (1981) discussed the four major concerns relating to trustworthiness. The following four criteria were followed in the audit process.

(1) Truth value – known as the internal validity and credibility of the inquiry.

Findings were reviewed with a number of data sources. Credibility of the data was enhanced with the researcher performing peer debriefing, reference group debates and discussions and extensive interactions with supervisors in order to test ideas and detach themselves from time to time from the immediacy of the data. Triangulation of the data sources and theories to support credibility was evident, the former by various consultations during the course of the study and the latter by extensive Literature Review encompassing ideas from several different paradigms and later expansion of this review and further insights and leads became apparent.

(2) Applicability – refers to the external validity (generalisability) and transferability through the existence of "thick descriptions" about the content.

A review of all support materials (e.g. reflective notes and codes transcripts) revealed that the researcher had consistently made extensive notes and reflections about each focus group soon after it was performed. Through the series of audit meetings with the researcher, it was highly apparent that the researcher had followed a multilayered process of coding, questioning, reflecting, and interacting with the second coder through lively dialogue in supervision meetings to arrive at a rich process of thematic analysis.

(3) Consistency – is the reliability, dependability or replicability. This involves planning the process of how data is collected, analysed and interpreted, that is, establishing an "audit trail" to ensure the process has stability and trackability.

An audit trail and triangulation of the data sources was conducted to avoid problems associated with multiple realities and changing perceptions of the participants and focus group data more generally. Data was verified from at least two sources: through the literature, experts from the Delphi process, expert supervisor and the research team.

This enabled the perceptions of several investigators to be compared. Different theories were discussed and alternative explanations were tested. The collection of data from a variety of perspectives, using a number of methods, and drawing upon a variety of sources enabled the predilections to be tested as strenuously as possible. A clear explanation of the process of data collection and analysis was provided. The auditor was satisfied that the audit trail was clearly established so that this research could be carried out by others if necessary.

(4) Neutrality – otherwise known as objectivity or confirmability.

This was conducted through the review of all the available data and the process of analysis. Any biases or motives of the researcher were balanced by seeking multiple viewpoints from the various focus

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groups and through extensive consultation with research team members and reference group experts from diverse areas of interest on this topic. The researcher clearly and openly briefed the auditor on research goals, their subjective experience of the research process, and their personal and professional motivations for the research. The researcher was open about their prior use of exposure therapy in their work and the potential bias that it may bring to the process. They took active steps to have independent facilitators for focus groups, to broaden the Literature Review of the topic and to consult widely to counter this, as well as having extensive conversations with the auditor and their supervisor about this.

After discussion with the auditor, the following further criteria were decided on to monitor the audit trail process:

Evidence of increased insight as a result of data analysis. This included:

- Ability to suspend preconceived ideas and notice unexpected data
- Alert to categories of behaviour not covered by the general guide for the focus group process
- Process open to revision if necessary
- Transparency of interpretation and decision-making about data analysis and conclusions
- Thick description
- Appropriateness of the consent process
- Maintenance of confidentiality in process and reporting
- Inclusion of all stakeholders.

**Evidence of increased insight as a result of data analysis**

There were numerous examples of new insights developed as a result of the data analysis. These ranged from making theoretical links or raising theoretical questions to highlighting multiple areas where new and contested ideas were apparent in the data that challenged the researcher's notions and/or the existing literature. The layered process of data coding also confirmed that the researcher arrived at a much more in-depth point of understanding of the main themes from the data at the conclusion of data analysis. The auditor was able to track this progression and growth by viewing the building of themes and sub-themes, schemas used for determining this and through the researcher providing examples of their thinking process regarding this.

*Appropriateness of the consent process*
The methodology information provided to the auditor clearly listed the consent process to be followed. The researcher further provided the auditor of evidence of this through the transcripts of focus groups where consent appeared to be clearly discussed.

*Maintenance of confidentiality in process and reporting*
All transcripts and other support documentation provided to the auditor was meticulous in ensuring that the names or any other identifying information about participants was absent, thus ensuring confidentiality of participants.

*Inclusion of all stakeholders*
The diversity of stakeholders and types of focus group provided evidence that the researcher was willing to include as many alternative views on the issue of problem gambling as possible. This was further confirmed with the researcher's intention to run further focus groups with cognitive clinicians

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and people who had not sought help for their gambling problems, following recognition that the views of these stakeholders may also be important to enhance the rigour of the research.

**Conclusion**

I find this research to be conducted ethically, according to clearly described and justified methods. There is clear evidence of the derivation of insights and themes from the various data sources and their analysis. This research has established a clear audit trail.


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Graduate Program in Chronic Condition Management & Self-Management
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# APPENDIX 6. STEPS IN DATA ANALYSIS

1. Each focus group was transcribed.

2. Transcription coded (open coding).

3. Both coders meet and described the open codes. Discrepancies were reviewed and described until a consensus was achieved.

4. Themes from each group were identified (axial coding and constant comparative analysis).

5. Themes were extracted and aggregated across all groups (axial coding and constant comparative analysis).

6. New themes were identified. Themes were refined (hypothesis generation and constant comparative analysis).

7. Both coders meet and described themes and patterns emerging with each variable (hypothesis generation and constant comparative analysis).

8. Themes were analysed.

9. Hypothesis generated.

10. Synthesis of the data.

11. Report.

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# APPENDIX 7. EXAMPLES OF THE PROCESS OF AXIAL CODING

For example a code relating to a trigger for this SGTS client was:

> *There could be triggers like urges like a smell that could get the urge going again and that's why I relapsed.*

An example of the code for urges for this NGO consumer was:

> *As you know I still have the urge every day.*

Cognitions were more complex, having a number of different components, such as cognitions about winning, as can be seen by this SGTS client's quote:

> *I will win this time, it will be different.*

An NGO worker stated:

> *you switch off your brain and that's what you learn to do as a coping mechanism* (gambling was a coping mechanism implied).

Gambling as a way to make money is identified by this SGTS client*:*

> *I need some money to pay the bills so you go and play and think I will win.*

Cognitions that gambling was exciting identified by this SGTS client:

> *I really just enjoyed the thrill of a win.*

This is an example of a quote for environmental factors by an SGTS client:

> *If you want to go out for a meal, yes its everywhere, it's impossible to not be near it.*

An example of availability of gaming machines and accessibility was described in this quote by an SGTS client:

> *yes they are open 24 hours now.*

A statement relating to the gaming machine design was from an SGTS worker:

> *then the more likely they will develop that problem with the random reinforcement.*

This quote described gambling as a way to deal with stress (NGO worker):

> *that's one way for her that she sees in order to get away from everything and all the stress.*

Relationships covered a number of codes including positive and negative support and peer support, dysfunctional supportive relationships and communication patterns. A supportive relationship was considered a protective factor against relapse. This is an example by an NGO client:

> *I am not saying I would never play again but I think I am a bit lucky because there are two of us because we support each other whereas some people don't have that.*

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A negative relationship as risk factor is seen by this following quote by an NGO worker:

> *They could be threatened by the loss of relationship.*

Reduced resilience through poor coping strategies was evident in this comment by an SGTS client:

> *As you know I still have the urge every day, so anything big, trigger factors like stress, financial pressure, or when I am vulnerable, depression or anything like that, trying to get rid of the urges is a big thing.*

Treatment interventions were considered important by SGTS clients:

> *I haven't had a lapse since I have done the programme.*

and counselling alone was not considered helpful for this client:

> *you have had counselling and you have relapsed a lot.*

Clients need to be able to apply the skills learnt in treatment to reduce the risk of relapse and improve treatment efficacy as reported by this SGTS client*:*

> *They can get through it successfully but all the stuff that we do, the people apply it to themselves.*

Co-morbidity was considered important by some NGO clients in the following quotes:

> *in his life and the other client, he has an alcohol problem as well as gambling, and otherwise they become very depressed.*

Culture was another code identified by this NGO worker:

> *Could we look at say a predictor of relapse and problem gambling as one of cultural ethnic background as far as access or non access to certain parts of venues?*

Motivation to stop gambling was important as a protective factor and lack of motivation to stop gambling as a risk factor by this SGTS client:

> *that's about whether they want to stop or not.*

Mastery or management of relapse

After further review and discussion of the codes the theme of mastery or management of relapse was identified across each group. A total of 100 codes were identified across the four focus groups.

These quotes support the beliefs held by the NGO workers and NGO clients about there being no cures for gambling addictions. This NGO worker stated:

> *I tend to talk to the clients first up cause they say I want to stop and I say we can achieve that eventually if that is what you want but I am warning you now that you will go back to gambling at some stage.*

An NGO client talked about the fear and relapse:

> *You are talking about relapsing; I haven't relapsed for one simple reason, its fear.*

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Some had the belief that they had overcome their gambling problems. As described in the following quote by an SGTS client:

> *So there is not even a coping mechanism for me, I no longer have that urge.*

This is supported by an SGTS worker, who believes the treatment works and clients can have positive treatment outcomes:

> *We know the model works, we are pretty confident that it works.*

# APPENDIX 8. FOCUS GROUP DATA FOR THE GENERATION OF HYPOTHESES

Section and table numbering follows section 4 'Results' in the main body of the report.

## 4.3 Environmental factors in relapse

Table 9. Environmental factors in relapse.

| Appendix | Allocated codes | Environmental factors |
|----------|----------------:|-----------------------|
| 4.3.a. | 17 | Gambling environment |
| 4.3.b. | 13 | Incentives |
| | 30 | Total |

### 4.3.a Gambling environments and accessibility to gambling opportunities

The opportunity to gamble was considered to be everywhere:

> *If you want to go out for a meal, yes it's everywhere, it's impossible to not be near.* (SGTS client)

> *If you live in a suburb you can walk to 5 or 6 venues* (and gamble implied) *easy and that's quite accepted and one or two in the morning if you can't sleep.* (NGO worker)

> *Even saying I am not going to go and I am in the car park and then think I am not going, next thing you know I am getting changed. It just takes over* (gambling implied). (NGO client)

> *Yes so nowadays it's more accessible. If you couldn't go to a venue, you would just end up dealing with it* (implied stress); *I'm not sure, twiddling your thumbs.* (SGTS worker)

> *The access to it* (venue implied) *is easy so their first coping mechanism might be to go back gambling.* (SGTS worker)

> *It might be the relapse happens because the gambling is so available and it's so innocent, it's sold in a newsagent.* (SGTS worker)

> *They just mail them to you* (birthday vouchers implied), *if it's your birthday they will send you something like the equivalent of $50 so we went in there and got meal vouchers. But if I wasn't well or strong enough that could have tempted me because we walked through where all the machines were.* (SGTS client)

> *We don't go to hotels, which is fortunate for me because I think if we are in hotels and I was left to my own devices I am not sure whether I wouldn't wander around again* (and gamble implied). (NGO client)

This NGO worker described that in one country hotel Indigenous people were not allowed in the bistro and could only socialise in the gaming room:

> *Could we look at say a predictor of relapse and problem gambling as one of cultural ethnic background as far as access or non access to certain parts of venues? You said they are not allowed in the bistro part* (Indigenous people implied); *open doors to the gaming areas.*

Once a client enters a gaming venue the inducements and ambience make gambling increasingly difficult to resist, increasing the risk of relapse.

### 4.3.b Incentives or reinforcements to gamble

*The appeal of the gambling venue*

> *In the … paper, they have tokens for hotel with a meal, this is my own theory but the … paper particularly targets the elderly population of readers and lonely people and pensioners who can't really afford it but it's a social outlet and free tokens.* (SGTS client)

> *Also the hotels are having free poker nights now so the incentive you can come in and you don't have to spend anything and that's when you can get hooked onto something further and further and that might be an external thing that could be a contributing factor to some form of gambling.* (SGTS client)

Another SGTS client stated loyalty points at the casino were incentives to gamble:

> *Think loyalty points ... Like the casino, I still have my card after I went.*

This SGTS worker talked about how advertising enticed people to go into venues:

> *All the little bits and pieces that you drive along and see and go to the newsagent and see Keno.*

> *I understand what the attraction is. It's just everything* (gambling implied). *We always hear about the atmosphere. If you are down, and you go there, it's just somewhere to go to escape.* (NGO client)

> *There is one person who sits around and has coffee and he enjoys just the ambience of the whole venue*. (NGO worker)

Similarly this NGO client described the *nice vibe* inside the venue:

> *It's not really, its pretty ugly but on the exterior when you walk in its got a nice vibe, with the lights, the colours, the staff; the nice chairs.*

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And another:

> *there is music, comfortable chairs, you can have a fag, a drink, I don't drink, and you are sitting in front of these gorgeous flashing lights and isn't this exciting.* (NGO client)

This SGTS worker described the gambling environment as an escape:

> *one of the studies they did was electronic gaming machines and the Victorian place, the big casino thing and one study they did that asked women what it was about the environment that attracted them and they said no clocks, time out was like being in a different world.*

*Accessibility of money*

> *I would definitely go to the venue where I could get the money easy.* (NGO client)

*Machine Design*

Whilst discussing their understanding of the way in which problem gambling develops, this SGTS worker stated that:

> *the more likely they will develop that problem* (gambling implied) *with the random reinforcement paid out by the gaming machine.*

*Hypothesis 1: Environmental cues provide triggers for relapse back to gambling.*

*Hypothesis 2: There are multiple operant rewards in gambling venues which shape gambling behaviour and make relapse more likely.*

## 4.4 Negative affective states as a factor for gambling relapse

Table 10. Negative affective states as a factor for gambling relapse.

| Appendix | Allocated codes | Negative affective states |
|----------|-----------------|---------------------------|
| 4.4.a. | 28 | Co-morbidity |
| 4.4.b. | 33 | Stress |
| 4.4.c. | 22 | Escape |
| 4.4.d. | 16 | Financial stress |
| 4.4.e. | 8 | Boredom |
| 4.4.f. | 3 | Physical Health |
| | **108** | **Total** |

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### 4.4.a Co-morbidity resulting in negative affects acts as a trigger for relapse

The following statements provided evidence that negative affective states associated with mental health co-morbidity including anxiety disorders, depression, and substance use disorders increased the vulnerability for relapse. Similarly, those with a history of trauma and possible PTSD, pain and physical illness also experienced many negative affects which appeared to initiate gambling relapse for some problem gamblers.

*Trauma and abuse*

The negative affect associated with history of trauma and abuse was considered to be risk factors for relapse:

> *Things that affect treatment; things like co-morbidities, past history, abuse or whatever, what if it's those things, their past history of trauma.* (SGTS worker)

> *… it could be so many other factors in the past that had affected them and we know that as a result of that people tend to do something (gambling implied) else in order to take their (emotional implied) pain*. (SGTS worker)

> *At that moment or what they had been in the past. I think it could be so many other things* (initiated relapse implied), *it could be trauma.* (SGTS worker)

> *Perhaps they need to escape* (by gambling implied) *from trauma, stress in their life.* (NGO worker)

> *I often hear that from the hotel owners, they say we don't have a problem with intoxication here and they are quite happy, but that doesn't mean there is decreased domestic violence, it's probably increased because there is less money* (due to gambling implied). (NGO worker)

This SGTS worker had seen clients with and without co-morbidities, but the key to treatment was considered extinction of the urge to gamble*:*

> *I have seen lots of gamblers with and without co-morbidity, even if the co-morbidities are not there, if the person doesn't extinguish that response aside from all of the added disorders and co-morbidities, just that basic learning theory, if its not extinguished* (urge implied) *the person is vulnerable.*

*Alcohol dependence*

Drinking and gambling were identified as occurring together, drinking contributing to relapse through disinhibition.

> *The Fijian person has the drinking problem as well and now it seems to be more the drinking in his life and the other client, he has an alcohol problem as well as gambling.* (NGO worker)

> *Many people say I am OK* (gambling implied) *as long as I don't have a drink.* (NGO worker)

> *They are all drinking* (gamblers implied)*, because alcohol is implicated a lot with breaking people's inhibitions and that I would say to you is another significant issue* (for relapse implied). (NGO client)

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> *In the literature it says a number of gamblers used to have problems with drugs and drink before they started gambling, so it would be interesting to see if when they stopped gambling if they started drinking again.* (SGTS worker)

*Depression*

Depression was identified as either a consequence of gambling or a risk for gambling by the following participants.

> *I tend to talk to the clients first up cause they say 'I want to stop' and I say we can achieve that eventually if that is what you want but I am warning you now that you will go back to gambling at some stage and do not think that that is a failure because otherwise they are setting themselves up for that, otherwise they become very depressed; they avoid the counsellors then.* (NGO worker)

> *If a person is not feeling strong or well* (they will gamble implied)*, I am talking about depression.* (SGTS client)

> *I would never want to go back and do something like that, its just self-destructive and makes you more depressed.* (SGTS client)

> *One probability* (relapse implied) *is depression; women can be a bit more prevalent to depression.* (SGTS worker)

> *We used to say Sydney Swans got done today, I am so depressed, I will go and play the pokies.* (NGO client)

> *Depression and boredom, you need leisure activities.* (NGO client)

> *If a person is not feeling strong or well, I am talking about depression and something or some big event occurs in their life, I haven't relapsed but I think that could lead to relapse.* (NGO client)

*Anger*

Emotions such as anger were identified as predictors of relapse.

> *Anger is a big one* (predictor for relapse implied)*. Angry with their partner;* (NGO worker)

This SGTS client's wife seemed angry when talking about her husband when financial decisions had to be made:

> *I have let him come back into the financial situation but I still have my pulse on every financial aspect that we have in our life and I am the one that pretty much makes the major decisions.*

*Shame and self-esteem*

The shame that was often associated with gambling behaviours was a common theme identified as leading to relapse.

> *Do you think that has helped you from relapsing as I was really ashamed.* (SGTS client)

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> *I was really ashamed of this for a long time and then I started to speak to people and I told my friends and everybody else and now it's become just so open and we discuss it so often.* (SGTS client, answering above question)

> *I think low self-esteem could be another predictor.* (SGTS client)

> *Also the individual feels out of control; there is that mental harm to themselves, I am such a bad person* (for gambling implied). (NGO worker)

This NGO worker provided a case example of a client who felt less worthy for being made redundant and went back to gambling:

> *Now this wasn't poker machines it was horse race betting on the TAB and when he went back to it (* gambling relapse implied*) $600,000 later the family and the whole lot collapsed around him, he managed to keep it a secret for quite some years but what triggered that, he was in a responsible job, good position, he was made redundant and his position was the Bank Manager therefore money was no stranger to him and he should have known how to handle money but it was something to do with the fact by being made redundant he felt less than worthy or necessary.*

*Grief*

Grief was also identified as a risk factor for relapse:

> *There a few there* (risks for relapse implied), *dismay, there's grief* (NGO worker)

This NGO client seemed to experience a sense of grief over the money she has wasted as a consequence of gambling:

> *I have 3 sons with ordinary jobs and here I am spending hundreds of dollars and if my son asked for $100 I have to say no I don't have that. To think that I have wasted all that money I could have given it to my sons*

*Grief in an Aboriginal community*

An NGO worker talked about the grief associated with the death of a young girl leading to Aboriginal people from over the lands coming together in a poker machine area:

> *I have seen people at funerals after at; … there was a 14 yo girl in a car accident and that day the pokie area of the hotel was 3 or 4 deep in Aboriginal people, there wasn't one non Aboriginal person in there and there was a mixture of town people and the remote people who had come down and I went in there specifically that night to have a look and it was pay day for the funeral.*

**4.4.b Stress**

These NGO clients described gambling as an escape from difficulties:

> *I was going through hell at the time and it seemed like a place where I could just escape,* and as time out: *Yes I didn't want to be home, I am a single Mum going through hell and I did not want to be home.*

This SGTS worker also recognised that the excitement of the gambling scenario provided time out from stress in order to feel better:

> *They want to feel good, and so of course the gambling scenario provides an ambience of, it's exciting.*

> *The gambling, it's a relief, and it's an indicator of bigger issues in their life, like the screaming kids at home.* (NGO worker)

> *I think stress definitely is a predictor* (of relapse implied*) but there is good stress and bad stress. There is stress that you are so busy with so much to do, but the negative stress.* (SGTS client)

> *That's one way* (gambling implied) *for her that she sees in order to get away from everything and all the stress. They just go in to numb out.* (SGTS worker)

This NGO client described there were many layers to a relapse:

> *That has a few layers to it* (gambling relapse implied). *It's the actual stressful events and the things that are there, like annoying partners or it could be the thinking that you have always carried through with you about how you approach problems and how you define yourself.*

This SGTS worker suggested that gambling was an ineffective way to deal with stress:

> *Ineffectual coping strategies* (gambling implied) *in dealing with stress.*

**4.4.c Escape**

> *I think that letting go of your mindfulness lets go of your stress and what you are worrying about so for the same reason that you are going to sit in front of a pokie machine and fill it up with your hard earned money to get away from everything, that's why you switch off your brain and that's what you learn to do as a coping mechanism.* (NGO worker)

> *I reckon that it's like a coping mechanism like it is for many other reasons that people do things to get out of their brain because the brain is an uncomfortable place to be in.* (NGO worker)

> *There could be 15 clocks around them, its totally irrelevant, they are just in a total numb zone and they don't have to think or feel anything for that period of time whether its 3 minutes, 3 hours or 3 days.* (SGTS worker)

> *They don't think or feel they don't do anything and that's the different. It's like being on drugs* (gambling implied). (SGTS worker)

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#### 4.4.d Financial stress

The following quotes provide examples of negative affective states caused by financial stress leading to the desire to gamble:

> *As you know I still have the urge every day, so anything big, trigger factors like stress, financial pressure, or when I am vulnerable, depression or anything like that, trying to get rid of the urge is a big thing. But certainly I think financial stress could absolutely be a predictor for relapsing.* (SGTS client)

> *You waste what money you do have on the machines and you still have that bill to pay. I think the driving force* (gambling urge implied) *to play the machines is the fact that I need some money to pay the bills so you go and play and think I will win.* (NGO client)

> *The financial stress boils down to what sort of relationship you have with your partner and your supporting network. I think in some situations it could spur people on to a relapse.* (SGTS client)

> *If you are addicted to it you get that rush from it and it's easy to forget about the money you spent.* (NGO client)

A negative affective state seems evident from this NGO client on account of the amount of money lost to gambling that could have been used to buy a house:

> *We just about lost enough money to buy a small house and occasionally I get the urge still even now.*

> *To think that I have wasted all that money I could have given it to my sons. You become irrational when you get it* (urge implied) *into your system.* (NGO client)

> *These are homeless women and probably don't have much money. That is totally irrelevant really because they haven't got lots and lots of money to keep on putting in and the $500 they have got for the fortnight is an awful lot of money if they have got that much in their pocket but the difference for them is that they blank out, they just go into a total no zone, they don't think or feel they don't do anything and that's the different. It's like being on drugs and a lot of them do drugs.* (SGTS worker)

#### 4.4.e Boredom

Participants described an inability to tolerate the emotions associated with being bored as indicating risk for a gambling relapse.

> *One thing that helped me when I gave up (gambling implied), I found that the problem came when you are sitting home with nothing to do, and its boredom, loneliness and I found that I had to find something else to do, go down to the library.* (NGO client)

> *When you are bored, potentially you are in danger of relapsing I am sure.* (SGTS client)

> *I think you have hit on another predictor there, when you are bored. When people are bored that's another tool. And boredom through maybe lack of social network, friends, people to talk to … I am handling it differently now cause I am not bored, not pacing, not trying to put things in correct order any more. It's quite calming. I can*

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*understand boredom would be a problem* (gambling relapse implied) *if you are sitting around doing nothing.* (SGTS client)

*That helped me when I gave up, I found that the problem came when you are sitting home with nothing to do, and its boredom, loneliness and I found that I had to find something else to do, go down to the library, go to the TAB and have a bet, I don't have a problem with it, but I couldn't leave those pokie machines.* (NGO client)

### 4.4.f Physical health

Physical illness and pain were acknowledged by some participants to play a role in relapse.

*But his sister is the one that is wanting just to minimise her gambling just to $30 a week which she seems to be succeeding at the moment. She has got a lot of other issues as well as they always do, she has a lot of health issues.* (NGO worker)

*She has lots of car accidents and she has a lot of pain* (causing her to gamble implied). (NGO worker)

*I think a serious physical illness, yes his was life threatening. I feel that he has probably thought he's not going to come out of this. It's his second bout with cancer and a few weeks before he went in he's on his own so he's been hitting the gambling again.* (SGTS client)

She *said before he's in hospital at the moment, just getting over some cancer and he has had a hard time of trying to recover and what they have found out now, as he has no one an his neighbours have been looking after his affairs, what they have found out that what they think is slowing his recovery is that he has a gambling habit again* (relapse implied), *he went back gambling and borrowed against his house which was freehold, plus he has borrowed we don't know who, and so after digging deep they have found he's got this debt now and they think he doesn't want to come home.* (SGTS client)

*Hypothesis 3: In some problem gamblers the presence of negative affective states initiates a sequence of events that increases the risk for relapse.*

*Hypothesis 4: Negative affective states secondary to gambling problems create a vicious cycle where repeated relapse is likely.*

## 4.5 Cognitions as a factor in gambling relapse

Table 11. Cognitions as a factor in gambling relapse.

| Section -appendix | Allocated codes | Cognitions |
|---|---:|---|
| 4.5.a. | 114 | Erroneous beliefs |
| 4.5.b. | 9 | Shame |
| 4.5.c. | 8 | Event |
| 4.5.d. | 6 | Gender |
| 4.5.e. | 2 | Stigma |
| | **139** | **Total** |

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## 4.5.a Erroneous beliefs

The following section describes specific groups of cognitions or themes that emerged from the focus groups in relation to risk and the vulnerability to relapse.

*Cognitions about winning are triggered by stress*

> *It seems to me that when I am short of money and I need to pay some bills I go on the pokie machines.* (NGO client)
>
> *You waste what money you do have on the machines and you still have that bill to pay. I think the driving force to play the machines is the fact that I need some money to pay the bills so you go and play and think 'I will win.* (NGO client)
>
> *If there was an extra bill that came in or N ... was upset about the finances as they were then, that may have been something that may have prompted me to get a small win in.* (SGTS client)
>
> *What worries me with S ... we are still devastated financially and there is always pressure and that's my biggest concern that the pressure will push him back to it.* (wife of SGTS client)
>
> *When I was gambling I saw it as a way of making money but now I would not dream of it because I know its ridiculous, it would make things worse, there is no chance it would make things better.* (SGTS client)
>
> *But certainly I think financial stress could absolutely be a predictor for relapsing* (SGTS client)

*Cognitions about winning resulting in excitement and relapse*

> *I really just enjoyed the thrill of a win and that was what I missed* (a trigger for gambling relapse implied), *not so much the financial gain.* (SGTS client)
>
> *It's a terrible drag once it gets into your system and I don't know what drags it, probably the thought of hitting that Jackpot or I have to get back that money that I have lost.* (NGO client)

Whilst this sequence of events starts off as positive, the affect rapidly changes to a negative sense of "drag" that accompanies the temptation or urge to gamble.

*Erroneous beliefs about the possibilities of winning*

These SGTS clients described how correcting the information processing bias or erroneous cognitions in regard to the way that machines paid out was not sufficient to prevent a relapse.

> *If we are talking about a compulsive gambler, from that point of view, my history briefly is that I used to work with poker machines so I used to program the percentages of what they paid out etc at my father's hotel so that information clearly didn't assist me at all, that information on its own. I learnt more about the machines and the random number generator and it certainly opened my eyes to a certain extent but I don't think that on its own would have been sufficient* (to stop me from relapsing implied)

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*These people that I talk to, they obviously still have the urge. They know all the reasons why they shouldn't but they can't help themselves* (and gamble in spite of this knowledge implied).

*This is more about relapses, if you are a compulsive gambler you are going to go there it doesn't matter what. If you have more information like now* (since treatment) *you would think twice about doing it, I can see that now.*

This NGO worker gave an example of magical thinking that the specific machine would provide a win as a risk for relapse:

*Does the vulnerability* (to relapse implied) *lie in the problem gambling in a sense of their distortions in cognitive thinking in a sense this machine is going to be successful.*

An SGTS worker described some of her clients' magical thoughts:

*There is still that thought that this time is going to be my time and I might win this time and it* (gambling implied) *will alleviate some of the problem this time.*

*So that's about your thinking and how you are actually rationalising it in your own mind and justifying it.*(gambling relapse implied) (SGTS client)

*You lie to yourself and you tell yourself the most stupid things* (so you can rationalise a decision to gamble implied). (SGTS client)

### 4.5.b Shame
A sense of shame relating to a lapse can be predictive of the progression to a relapse:

*My parents and parent's in-law and friends have all been very positive since the course but there was a time when I thought they didn't have any trust in me, and I thought they thought I was weak so I went and gambled* (a single episode*).*(SGTS client)

*It's easy for them to say no I won't, but I say if you do, don't think you have done something wrong.* (NGO worker)

An NGO worker gave this example of a client who had repeatedly said:

*I am such a bad person.*

### 4.5.c Event
An event can trigger a gambling relapse:

*If a football team won we would go down to the pokies and celebrate.* (NGO client)

*Sydney Swans won today, isn't that fantastic, let's go and celebrate* (and gamble implied). (NGO client)

### 4.5.d Gender
An SGTS worker stated that some women in particular had thoughts:

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> *If you are watching your thoughts and feelings, there had to be a reason why those women ended up there, it's not possible that it just happens, it has to be thoughts and feelings first before you* act.

This SGTS therapist referred to the environment for women that gave them time out in a different world:

> *One study they did that asked women what it was about the environment that attracted them and they said no clocks, time out was like being in a different world.*

**4.5.e Stigma**

> *As you are probably well aware there is a huge stigma attached to the whole gambling demon.* (SGTS client)

Whilst some of the above examples have not been related to relapse by the participants, it was clear to the facilitators of the groups that these negative cognitions were being discussed within the context of exploring factors that were associated with relapse. As such these negative cognitions would appear to be indirectly related to relapse by making problem gamblers more vulnerable to have negative cognitions and negative affects precipitating further gambling and relapse at a future time.

**4.5.1 Cognitions that make relapse less likely**

*Distraction as a cognitive strategy to manage relapse*

At times clients have been able to avoid the suspension of their critical thinking and reduce the possibility of a gambling relapse:

> *If you give yourself enough time away from them you get clarity and then you don't need to go back.* (NGO client)

> *You have got to not harbour those thoughts when they come into your head so it's very important to have something else to do and that's where I programme my mind to do.* (NGO client)

*Cognitions deferring the decision to gamble*

This NGO client described gambling as an addiction; she had to take one day at a time to be strong willed not to gamble:

> *I could block them now, but not then. One day at a time. Go tomorrow* (gamble implied*) because tomorrow never comes. Not with me; if you said that to me at 20 to 2 today, look go tomorrow, I am going tomorrow because I am strong willed and I have that fixed in my brain, OK I will get through today but when tomorrow comes I am off because I wasn't living in that program and that one day at a time.*

She also clearly indicated that this has only been possible for her since she has had a different cognitive set because she was now "living the program".

*Cognitive strategies used to manage the urge – coping behaviour*

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*I get out into my garden and I do some work and it refocusses me and I feel better about myself and those* (gambling implied) *thoughts go.* (NGO client)

*Vigilance: Heightening the memories about negative consequences of gambling*

*You come to the meetings and you listen to the stories of the people around the table and that's enough to drive you from not going to the machines, just to listen to their stories and what they go though and you can relate to it and it's true.* (NGO client)

*You are talking about relapsing; I haven't relapsed for one simple reason, its fear.* (NGO client)

*I said I haven't played for 18 months and touch wood we haven't had a relapse. The reason I haven't had a relapse is fear.* (NGO client)

*I like to get people to think that its always in the back of their mind that because in 10 years time if you think that you are cured then I think that you are more vulnerable because you have forgotten and you walk into the pub and something is happening in your life and you think well I am alright because I haven't gambled for 10 years and I am cured but you are more at risk so if you think I must not do that because its too dangerous.* (NGO worker)

*Correcting erroneous beliefs*

An SGTS client described that extinguishing the urge to gamble will lead to the correction of erroneous beliefs about gambling:

*When I was gambling I saw it as a way of making money but now* (since completing treatment implied) *I would not dream of it because I know it's ridiculous.*

*It would help* (correcting erroneous cognitions implied) *but not by itself though* (treatment to extinguish urge was required implied). *I think it does help because when I talk to people about it, when you say 88% of the time, its 88% over the life of the machine where a lot of gamblers are of the idea if they put in $10 they will get 88% of it, they don't know about its 88% over the life time of that machine and its at random and you have to be very lucky if you could walk out with that much.* (SGTS client)

*Abstinence results in clarity of cognitions*

*If you give yourself enough time away from them you get clarity and then you don't need to go back* (gambling implied) (NGO client)

*I would say go and get me a couple of hundred dollars and I would say quick I need more money I couldn't get it into the machine quick enough but now to lose that particular amount of money in one day to me, I can't even understand how my cognitive processes were going at that time. It seems insane.* (NGO client)

These quotes suggest that once the arousal associated with the urge to gamble has been overcome cognitions remain logical and the client is able to critically observe the situation and puts things into perspective reducing the risk of relapse.

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*Hypothesis 5: Cognitions can directly and indirectly increase or decrease the intensity of the urge to gamble and the likelihood of relapse.*

*Hypothesis 6: The increasing arousal associated with an urge to gamble initiates a process of illogical cognitions about winning and a suspension of critical thinking about anticipated gambling resulting in relapse.*

*Hypothesis 7: Treatment that effectively manages the urge will lead to the return of critical thinking processes and reduce the risk of relapse.*

## 4.6 Urge as a factor in gambling relapse

Table 12. Urge as a factor for relapse in gambling behaviour.

| Appendix | Allocated codes | Urges to gamble |
|---|---|---|
| 4.6.a. | 70 | Urges |
| 4.6.b. | 19 | Triggers |
| 4.6.c. | 15 | Addiction |
| | **104** | **Total** |

### 4.6.a Characteristics of the urge to gamble

*Strength*
The intensity of the urge to gamble was described as overwhelming and difficult to resist.

> *You would walk through walls, that's how strong the urge was.* (NGO client)

> *They* (past urges) *were always so powerful.* (SGTS client)

> *It's a build up of intensity and a force that you just go.* (NGO client)

The function of the intensity of urge in relapse was commented on by an SGTS worker:

> *They haven't got over that uncontrollable urge.*

> *Yes people just drop their bundle and the urge is really strong.* (NGO worker)
> *You get that rush from it and it's easy to forget about the money you spent, we just about lost enough money to buy a small house and occasionally I get the urge still even now.* (NGO client)

The urge may also remain dormant and then emerge again with enough intensity to cause relapse:

> *Well if you have got an urge and it pops up from time to time, there can be a time where you give into* it (and relapse implied) (SGTS client).

*Excitement*
Feelings of excitement were often associated with the urge to gamble.

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> *Well, as soon as they go there and start throwing the coins in, the lights go on and it gets exciting.* (SGTS worker)

> *You remember all the lights and the rush you get from it.* (NGO client)

After ceasing to engage in gambling activities, the longing for the thrill lingers, leaving a person vulnerable to relapse.

> *I really just enjoyed the thrill of a win and that was what I missed.* (SGTS client)

> *You will get a client who says I still love it, it gives me a buzz …*
> *but generally people don't, they say I hate them. So by the time they come to someone like yourself, they are still engaging in that type of gambling behaviour but they dislike what they do, there's the addiction side of it they just can't break.* (NGO worker)

This again indicates an ongoing vulnerability to a gambling relapse.


*Arousal*

> *I watched this fellow walking up and down, he couldn't wait to finish his cigarette out on the footpath to get back into the gaming room and I thought he was really torn.* (NGO worker)

> *Yes much bigger money and when you are betting that big for me, it's frightening, you come out shaking. It's an interesting process because you feel quite physically sick afterwards and you don't remember that.*

Though this NGO client felt physically sick from the autonomic arousal after gambling, interestingly when the urge to gamble occurred again for him, he described an alteration of his cognition in that the memories of this physical sickness were forgotten increasing the risk of relapse.

Urge, cognitions and arousal reinforce each other:

> *Even saying I am not going to go and I am in the car park and then think I am not going, next thing you know I am getting changed. It just takes over indicating that the urge intensified to the point that he was no longer able to resist it.* (NGO client)


*Coping with the urge: Absence of control*

> *I have been involved in horse racing for many years and I have bet regularly and it's never ever been a problem for me. But the pokies, I have absolutely no control over* (urge implied). *Except the only way you can control it is not to participate in it and I guess that describes me with pokies because I cannot participate in it because I cannot walk in* (for fear of relapse implied). *The excuse was 6 or 7 days of the week, I will just take $20; and $1,000 or $2,000 later, that was just the opening excuse and I had no control. I can't understand that because I am not like that with horses at all.* (NGO client)

> *The individual feels out of control, there is that mental harm to themselves, I am such a bad person and I obviously can't control this and that could swing either way, abstinence or to even going back to gambling, just giving up* and a SGTS worker: *I*

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*think it's worth just considering about why is gambling such a difficult cycle to break. I am not saying that it's harder but it's a difficult cycle and why do they get into that cycle, they want to stop and they can't.* (NGO worker)

*People that don't gamble need to be educated because I thought he was weak and I have never had the urge to gamble and I couldn't understand and my family couldn't understand* (why he gambled implied*). People need to be educated.* (wife of SGTS client)

The data from the four focus groups provided evidence of the way the urge to gamble is overwhelming and difficult to resist. It was demonstrated that for some when the urge is intense they believe they have no control over their gambling and are vulnerable to relapse.

*Struggle*

Participants described how they always had to be on guard and could not be complacent for fear of relapsing; struggling with the urge was constant for them:

*It has such a hold of me and we* (PA member speaking about herself and her husband also a PA member) *have always said we must never be complacent.* (NGO client)

*I think that's why its important to have meetings so you don't get complacent and you keep it on a daily programme where you are constantly aware* (of the possibility of relapse implied). (NGO client)

*Yes people just drop their bundle and the urge is really strong, and even in 10 years time they will still have that* (possibility of relapse implied). (NGO worker)

Struggling with the urge is associated with vulnerability to relapse:

*Well if you have got an urge and it pops up from time to time, there can be a time where you give into it* (and relapse implied*).* (SGTS client)

*I love sewing, I have got so much material and patterns I could sit all day and sew but there is still that drag* (to gamble implied). (NGO client)

**4.6.b Triggers**

There were a number of different types of triggers to gamble that were identified by the participants. These triggers interacted together or on their own to elicit the urge to gamble.

*Some people might have a real clear thing that triggers them and it might be going out and buying a ticket or it might be some other event or stress.* (NGO client)

*Internal and external triggers*

*Now this wasn't poker machines, it was horse race betting on the TAB and when he went back to it $600,000 later the family and the whole lot collapsed around him, he managed to keep it a secret for quite some years but what triggered that, he was in a responsible job, good position, he was made redundant and his position was the Bank Manager therefore money was no stranger to him and he should have known how to handle* money *but it was something to do with the fact by being made redundant he felt less than worthy or necessary.* (NGO worker)

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*Celebration*

> *If a football team won we would go down to the pokies and celebrate* (NGO client)

> *Sydney Swans won today, isn't that fantastic, let's go and celebrate* (and gamble implied). (NGO client)

*Smell*

> *There could be triggers like urges like a smell that could get the urge going again and that's why I relapsed.* (SGTS client)

*Advertising and access*

> *That's what I am saying, is that because, that's what people are trying to stop* (gambling implied), *the sign that says game machine open until 3am in the morning. All the little bits and pieces that you drive along and see and go to the newsagent and see Keno.* (SGTS worker)

> *That goes back to the theory where all of a sudden it's connected. They are already past the therapy stage and its all still there and the access to it is easy so their first coping mechanism might be to go back gambling*. (SGTS worker)

It was clear that there were a wide range of triggers that led to clients and workers in each of the groups to recognise that events, mood states or sensory perceptions, precipitated a desire to gamble. In some cases these appeared to be highly specific such as the client who referred to *smell* being a powerful trigger for him, whilst others identified environmental triggers that were shared by others. Others indicated that emotional states, life events or money were cues, precursors or precipitants of the urge to gamble and risk for relapse.

**4.6.c Gambling as an addiction**

Gambling was considered an addiction by some participants.

> *I could block them now, but not then. One day at a time. Go tomorrow because tomorrow never comes. Not with me. If you said that to me at 20 to 2 today, look go tomorrow, I am going tomorrow because I am strong willed and I have that fixed in my brain, OK I will get through today but when tomorrow comes I am off because I wasn't living in that program and that one day at a time. All I was hearing was I can go and play tomorrow. For me there is no doubt it's an addiction.* (NGO client)

> *My husband told my parents when I had a drinking problem and short of threatening him I told him not to tell them about my pokie addiction.* (NGO client)

> *But its funny I have heard from a few alcoholics that are going to AA now that they have started to develop a pokie addiction.* (NGO client)
> *Most of them don't really drink now either because they have the gambling addiction.* (NGO worker)

### 4.6.1 Individual variation in coping with the urge to gamble

*Avoidance*

Distraction techniques sometimes only provide minimal relief for the urge to gamble.

> *I love sewing, I have got so much material and patterns I could sit all day and sew but there is still that drag.* (NGO client)

> *I think the habit becomes so strong like when you are in the thick of it, that to try any thing else, the pokies were always a lot stronger.* (NGO client)

> *As you know I still have the urge every day, so anything big, trigger factors like stress, financial pressure, or when I am vulnerable, depression or anything like that, trying to get rid of the urges is a big thing* (and not gamble implied). (SGTS client)

*Mastery of the urge to gamble*

> *There could be triggers like urges like a smell that could get the urge going again and that's why I relapsed … but since we have done the course, there is nothing there, a smell is just a smell, it doesn't mean anything to me. If I walk into a pub or wherever a venue and there are distinctive smells things like that, it has totally killed everything, I have no connection, and I don't care about it. (SGTS client)*

> *I can't find a trigger that will influence me to go gambling again.* (SGTS client)

> *After 8 months I don't have that great dragging* (urge implied). *I can go to the hotel and have lunch and walk past the machines.* (NGO client)

> *I think what it sounds like is the key to preventing relapse is to ensure that the urge is extinguished. (SGTS worker)*

> *We hypothesise that if people don't fully extinguish their urge to gamble then they are at greater risk of having a relapse.* (SGTS worker)

> *So there is not even a coping mechanism for me, I no longer have that urge.* (SGTS client)

> *I was really upset and emotional and I may have been a bit depressed but I didn't go and gamble and when I was gambling these are the sorts of things that would set me off, I have been really well.* (SGTS client)

> *I had plenty going on with my life, my gambling was very quick, very secretive, in and out sort of thing, I didn't have spare time to do it, so for me this programme itself was what did it for me. There were no coping mechanisms; it just broke the link* (between urge and gambling behaviour implied), *this urge and physically releasing the money into the slot. That's why this programme worked wonders for me having had counselling before; this was obviously what triggered the best result for me without doubt.* (SGTS client)

*The idea of this course is what I understood is that you should actually be able to go to these venues these areas and still function normally and not have an urge to go into them.* (SGTS worker)

*Management of the urge to gamble*

*You have got to not harbour those thoughts when they come into your head so it's very important to have something else to do and that's where I programme my mind to do. Those thoughts come into my head and I know now not to dwell on them as that's disastrous* (urge to gamble develops implied) *so I get out into my garden and I do some work and it refocusses me and I feel better about myself and those thoughts go.* (NGO client)

*I think that is an absolute crucial part of the not having a lapse for me, was learning the coping mechanisms and replacing the gambling with other stuff but of course that takes a while to do but I think that is crucial.* (SGTS client)

*You hear people becoming fitness fanatics because they want to shift it to some other focus.* (NGO client)

*You are not literally there 24 hours a day so there is some point where you are home or doing other things but there is a point where you decide to go.* (NGO client)

*Support to resist the urge*

*It seems insane. I am not saying I would never play again but I think I am a bit lucky because there are two of us because we support each other* (not to gamble implied) *whereas some people don't have that.* (NGO client)

Belief in a "higher power" can help, bringing about a symbolic cognitive shift: *Higher power is essential because if I understand that I myself can't do it and I can give it to a higher power then I have more trust, more faith and I can relax without struggling because I know it's going to be ok.* (NGO client)

Attendance at Pokies Anonymous was helpful for some clients. They found the peer support and stories of distress about gambling helped them to not gamble:

*We inspire each other; no judgement. We have had a couple recently and they are in a bit of a mess through the pokies and you listen to them and one is a particularly heart breaking story, and it keeps you on track.*

*Everyone helps each other* (with not giving in to the desire to gamble implied). *We do talk about confidentiality however everyone helps each other and inspire everyone. You are inspired by their courage, and what they have been through, one in particular, and I don't know whether I would have had the courage to go through it.* (NGO client)

*I think in some situations it could spur people on to a relapse but in other situations after going through the course and knowing and being aware of what they are having to deal with it probably should make you a bit stronger.* (SGTS client)

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> *It has such a hold of me and we* (PA member speaking about herself and her husband also a PA member) *have always said we must never be complacent because it remains with you for a long time.* (NGO client)

*Urge and cognitions*

Once the urge to gamble is present and is strong enough it appeared that it was difficult to think clearly about the consequences of one's choice to engage in gambling activities:

> *Even saying I am not going to go and I am in the car park and then think I am not going, next thing you know I am getting changed. It just takes over.* (NGO client)

> *If you are addicted to it you get that rush from it and it's easy to forget about the money you spent.* (NGO client)

The presence of the urge limits a person's ability to think clearly:

> *These people that I talk to, they obviously still have the urge. They know all the reasons why they shouldn't but they can't help themselves because they still have that urge there.* (SGTS client)

Cognitions are increasingly affected as relapse occurs.

> *It's an interesting process because you feel quite physically sick afterwards and you don't remember that* (NGO client),

suggesting that memory may be distorted.

**4.6.2 A progression of cognitions and urges leading to relapse**

These examples from clients demonstrate that cognitions can lead to the urge to gamble.
Thoughts about gambling lead to the urge that:

> *just takes over.*

An NGO client talked about the urge taking over after thoughts about wanting and not wanting to gamble:

> *Even saying I am not going to go and I am in the car park and then think I am not going, next thing you know I am getting changed. It just takes over.*

> *You couldn't block them, if you sit there and thought about a drink for long enough I would be in the pub and it's the same with the pokies. You sit there and think about it long enough it just takes over.* (NGO client)

A SGTS consumer provided an example of arousal:

> *I really just enjoyed the thrill of a win.*

Another NGO client described his excitement as:

> *probably the thought of hitting that Jackpot*

as that process of heightened arousal built up.

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*When you get that urge to play the machine nothing is going to stop you.* (NGO client)

*Cognitions about gambling, distress, urge and the threat of relapse*

Cognitions about gambling may cause distress and the desire to gamble, which is followed by a relapse unless it is guarded against.

> *You have got to not harbour those thoughts* (gambling thoughts implied) *when they come into your head so it's very important to have something else to do and that's where I programme my mind to do. Those thoughts come into my head and I know now not to dwell on them as that's disastrous* (gambling relapse implied). (NGO client)

*Altered cognitions reinforcing relapse*

Clinically many clients describe being "in the zone" when they are gambling. This also came up in discussion in a number of the focus groups. This NGO worker reported some of her clients being:

> *caught in some sort of trance. They talk about a zone,*

suggesting altered cognitive processing.

> *You become almost robot like and you just sit there and it's almost as though the money loses its real sense of value.* (NGO client)

This NGO client talked her altered perception about money and how this exacerbated the relapse as they rationalise its not real money:

> *It's like a monopoly game; it's just pokie money, its not money to live on.*

It appeared from this NGO client's comment that at some point he decided to gamble:

> *Something happens that's a critical point when you decide to either go or not go.*

And another NGO client indicated that once the urge or arousal is sufficiently intense critical thinking, self-observation and the exercise of the will seemed to be suspended:

> *When you get that urge to play the machine nothing is going to stop you.*

Each of the clients indicated that there was a point at which they made the decision to gamble in response to a combined mental state where urge intensity, high arousal and erroneous cognitions prevailed.

Paralogical reasoning focuses on winning cognitions and minimises negative ones:

> *So that's about your thinking and how you are actually rationalising it in your own mind* (to gamble implied*) and justifying it.* (NGO client)

A mental chain of events was demonstrated by the NGO client who suggested when he was short of money he played the pokies hoping he would win money to pay them.

> *You waste what money you do have on the machines and you still have that bill to pay. I think the driving force to play the machines is the fact that I need some money to pay the bills so you go and play and think "I will win."*

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This induced a driving force to gamble. The suspension of critical thinking was noted in this quote as the client thought on this gambling occasion he would win enough money to pay his bills. Some clients are less aware of their thoughts:

> *With relapse you are talking about people who just suddenly find themselves* (zone-like state implied), *I have a lot of clients who don't know how they got there and I really think that so many people are so unaware of their own thoughts and their own feelings and that's how it can just happen like I am suddenly in this venue. If you are watching your thoughts and feelings, there had to be a reason why those women ended up there, it's not possible that it just happens, it has to be thoughts and feelings first before you* act. (NGO worker)

Similarly another NGO client described initial arousal as she had to get out of the house quickly to gamble and became almost "robotic" once at the machine. At this time money lost its value her critical thinking seemed to be suspended:

> *you get to the pub, you have to get out the house quick* (arousal seemed to be implied here), *because someone else could be on your favourite machine* (magical thinking exacerbating arousal)*, and you become almost robot like and you just sit there and its almost as though the money loses its real sense of value.*

This answer was offered to the question of why people want to be in the zone?:

> *They want to escape.* (NGO worker)

Critical thinking returns when gambling is over:

> *Each night when I come home I would think never again am I going to play those machines again.* (NGO client)

*Extinguishing the urge*

Extinguishing the urge to gamble extinguishes irrational thinking about gambling:

> *When I was gambling I saw it as a way of making money but now I would not dream of it because I know its ridiculous, it would make things worse, there is no chance it would make things better. When I was gambling I would sometimes think it was a way to make more money.* (SGTS client)

Having completed the program (urge extinction), cues to gamble are no longer risk factors for relapse:

> *But lets say prior to actually being through this course* (urge exposure)*, if there was an extra bill that came in or N... was upset about the finances as they were then, that may have been something that may have prompted me to get a small win in.* (SGTS client)

Before doing the urge exposure program that information alone about gaming machines was not enough to stop gambling:

> *If we are talking about a compulsive gambler, from that point of view, my history briefly is that I used to work with poker machines so I used to program the percentages of what they paid out etc. at my father's hotel so that information clearly didn't assist me at all, that information on its own. I learnt more about the machines and the random number generator and it certainly opened my eyes to a certain extent*

*but I don't think that on its own would have been sufficient* (implied treatment for the urge is required). (SGTS client)

Once not gambling people are able to think rationally again:

> *I couldn't rationalise it when I was playing. I can now. This is what we often say at the meetings, where the meetings have helped me it's enabled me to put these things into perspective because when we were playing I didn't put anything in perspective.* (NGO client)

*Hypothesis 8: There is a sequence of mental events involving the urge to gamble that increases or decreases the intensity of the urge, arousal and the risk of relapse.*

*Hypothesis 9: The intensity of urge and physiological arousal fluctuates over time.*

*Hypothesis 10: Urge extinction was the most effective in reducing the risk for relapse.*

*Hypothesis 11: The intensity of the urge or physiological arousal results in alteration of cognitive functions.*

## 4.7 Quality of relationships as a factor in relapse of problem gambling

Table 13. Quality of relationships as a factor in relapse.

| Appendix | Allocated codes | Quality of relationships |
|---|---|---|
| 4.7.a. | 65 | Social support |
| 4.7.b. | 16 | Loneliness |
| 4.7.c. | 8 | Culture |
| 4.7.d. | 6 | Religion |
| | **95** | **Total** |

**4.7.a Social Support**

*Negative social support*

Lack of social supports and gambling relapse

> *I think you have hit on another predictor there when you are bored. When people are bored that's another tool. And boredom through maybe lack of social network, friends, people to talk to.* (SGTS client)

> *They might end up having lack of support but it wouldn't necessarily trigger a relapse but it may create a vulnerability to relapse.* (SGTS worker)

Relationship conflict and relapse

> *That has a few layers to it. It's the actual stressful events and the things that are there, like annoying partners* (leading to gambling). (NGO client)

Therapy relationships and relapse

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This section addresses the increased risk of relapse when involved in a counter therapeutic relationship and the protective factors associated with a supportive therapeutic relationship.

> *We had a lass go to a counsellor and she was a mess before she went to the counsellor and then she went once and then came here. She had gone to see the counsellor and she wanted some answers as she was in a bad place and said she was a pokie addict. The counsellor said why do you think you are a pokie addict and she said she had sold her jewellery etc and the counsellor had the best intentions but she said have you tried to control it and she really did a lot of damage to that girl.* (NGO client)

A supportive worker as well as other peers were noted to have been important as protective factors against relapse:

> *It would be very hard for people not to have support because I think besides being able to talk to the worker when you are going through the programme it does help to be able to talk to other people about it. That's reinforcing, therapeutic and all that. For R…. and myself going to consumer voice* (peer support group) *and talking to other people that have had the same problem, I found that very supportive too.* (SGTS client)

Gambling couples and responsibility for relapse

There was one couple, both of whom were problem gamblers. This couple's symbiotic relationship resulted in both partners rationalising the decision to engage in gambling activities, leading to frequent relapses.

> *It used to be part of our life, me and the wife, with highs and lows, if a football team won we would go down to the pokies and celebrate.* (NGO client)

> *About 5 o'clock we would feed all our animals and then the night starts and I will say do you want to go and play the pokies, and he doesn't but I want to go and play. And this will go on for a couple of hours but he admitted one night at a meeting that he knew he would be going to the pokies but he didn't want it to be himself that suggested it, he would leave it up to me.* (NGO client)

In more common situations of a problem gambler with a non gambling partner, complacency" of a significant other at keeping track of the family finances can result in relapse:

> *They* (the significant other implied) *get into this state of complacency and often the partner doesn't take enough note of their finances, they lapse back and think everything is OK now because he or she has stopped and isn't gambling and because they are not keeping that check.* (NGO worker)

## The loss of trust, guilt and shame in the context of relapse

This section describes the theme of the burden of social stigma, guilt and shame which emerged as an axial code. This burden was carried by many problem gamblers as a consequence of the effect of gambling on relationships on the one hand and as a trigger for relapse on the other. When the loss of trust and shame was confronted, relationships appeared to change for the better, with increased support, a lessening of the impact of the stigma, guilt and shame and a reduced risk of relapse.

Loss of trust, guilt and shame resulting from gambling

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> *I would take issue with those people who want to define a lapse as one which doesn't do any harm to anybody else because you really can't determine that because the harm that's done is often hidden, it's in the relationship, it's in the loss of trust, it's in intangible things.* (NGO worker)
>
> *Even like in a relationship, you might have gambled $5 but because you have told your partner you are never going to gamble again, to them it could be $5,000 so it's a trust issue.* (NGO client)

Loss of trust, guilt and shame resulting in relapse

> *There was a time when I thought they didn't have any trust in me, and I thought they thought I was weak so I went and gambled.* (SGTS client)

*Positive social support*

In this section a range of support networks were identified from the data as reducing the risk of relapse from the data. Open acknowledgement of stigma, guilt and shame is seen as a protective factor against relapse.

This SGTS client shared that his wife had been supportive and comfortable about him telling others about his gambling problems and that this was an important protective factor which assisted him in preventing relapse:

> *I think absolutely opening up about it just having it out there. As you are probably well aware there is a huge stigma attached to the whole gambling demon if you like so bringing it out there and speaking to other people about it, I had made mention to my wife was she comfortable with me telling everyone about it, and the impact was the more people I tell the less likely I am to relapse. I guess again if nothing else it gave my wife a bit more assurance that it wasn't going to happen* (gambling relapse implied).
>
> *Yes the more people we tell the safer we feel. There are people watching for me. I think it's good.* (SGTS client)

Support from peers

The support gained from peers attending Pokies Anonymous (PA) was described as important to "keep on track" and reduce the chances of relapse.

> *We inspire each other. No judgement. We have had a couple recently and they are in a bit of a mess through the pokies and you listen to them and one is a particularly heart breaking story, and it keeps you on track.* (NGO client)
>
> *You can trust. If you can speak to someone on the same level you will open up to them. If someone is going to judge you and call you an idiot there is no way you are going to open up to them. You are going to pretend and lie.* (NGO client)
>
> *Everyone helps each other. We do talk about confidentiality however everyone helps each other and inspire everyone. You are inspired by their courage, and what they have been through, one in particular, and I don't know whether I would have had the courage to go through it.* (NGO client)
>
> *Families tend to jump to judgement quick.* (NGO client)

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> *My husband told my parents when I had a drinking problem and short of threatening him I told him not to tell them about my pokie addiction. They don't need to know everything about what's going on in my life.* (NGO client)

This NGO client talked about the positive support she and her husband had from attending regular PA meetings and also the support obtained from each other in reducing the risk of relapse:

> *For me, we have been going about 18 months or 2 years in June* (to PA implied), *since we started here. We haven't had a relapse.*

Interestingly this SGTS client explained her friend was not honest about his gambling and did not take the offer of her support and continued to gamble:

> *He had a gambling problem and then I told him I have one and he told me that he just stopped. He said I never went again. I spoke to him when I was going to counselling and I told him about when I came here and every now and then we would talk on the phone and he would say have you been anywhere near those awful machines, and when I heard there were people knocking on his door for money I thought that I bet he has been gambling.*

General support

> *I personally think left on my own I don't know that I could do it* (not gamble implied), *even though I decided to do it. I needed something else* (support implied). (NGO client)

> *They might end up having lack of support but it wouldn't necessarily trigger a relapse but it may create a vulnerability to relapse.* (SGTS client)

Support from partner

> *I am not saying I would never play again but I think I am a bit lucky because there are two of us because we support each other whereas some people don't have that.* (NGO client)

Support preventing a lapse becoming a relapse

Preventing a lapse becoming a relapse is a complex process usually involving the support from significant others, peers and workers. Therefore if a lapse occurred the ability to obtain support from a significant other was crucial in the prevention of a gambling relapse. It was notable that the ability to obtain this support to prevent a relapse was only described by SGTS clients.

> *Knowing that you could get back on track even if you did have a lapse. Yes and if you did have one (lapse implied) knowing that your partner was there and supporting you.* (SGTS client)

> *Yes that was all part of taking the pressure off of the whole lapse scenario which before it was a massive big threat* (relapse implied). (SGTS client)

Return of trust and the reduction of guilt and shame

Support from a significant other or a peer was considered an important protective factor against gambling relapse by these participants. It was noted that effective treatment could result in the return of trust from significant others and reduced the shame felt in relation to the problem gambling. This was considered important in reducing the risk of a gambling relapse.

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*To get that trust back that support grows and I become proud of myself the longer I go and I am sure everyone else is the longer I go. That builds confidence. If I didn't have those people, if I didn't have my wife my family, my extended family, my confidence would be so low and then it's back to square one.* (SGTS client)

*I was lucky T... stuck with me right the way though and my parents and parents in-law and friends have all been very positive since the course.* (SGTS client)

Indirect effects of supportive relationships and gambling relapse

The presence of positive support could have an indirect effect on gambling relapse through increasing self-esteem, confidence, communication and trust.

Partners described the importance of understanding what partners go through without taking responsibility for their gambling per se.

*A... told me everything that went on and I wanted to know because I needed to understand to cope because I couldn't understand. Once you understand it was a revelation and you participate and if your partners know you are 100% with them, whereas before as soon as A... would have a relapse we wouldn't be talking and I would lose confidence and his self-esteem would go down, whereas with this it's completely different.* (partner of SGTS client)

*I was really ashamed of this for a long time and then I started to speak to people and I told my friends and everybody else and now it's become just so open and we discuss it so often.* (SGTS client)

*You are usually surprised when people have figured it out, they already knew and didn't want to say anything in case they upset someone, but they say they are here for you, so that's really helped there.* (SGTS client)

### 4.7.b Loneliness
Gambling provided social contact or an outing for some who were lonely.

*She knows some other people there and that's her outing* (gambling implied). (NGO worker)

*They still want to go to the venue whether it's social or whatever they still want that without the issues.* (NGO worker)

*People in some cases are just totally disconnected from anything except the hotel or where other people gather.* (NGO worker)

Gambling can *plug a hole* for some:

*Do something to fill that side of it* (gambling implied); *plug the hole. That's what you have to do; these people that I talk to.* (SGTS client)

*She has ringed me from the car park of a hotel and its loneliness and not having friends.* (SGTS client)

It appeared from this participant's comments that her friend was in caught in a cycle. She stated that even though the reasons not to gamble are evident to the gambler, when, for example, they are triggered by loneliness, they can't help themselves.

> *They know all the reasons why they shouldn't but they can't help themselves.*

It appears that negative affective states secondary to gambling problems can create a vicious cycle where repeated relapse is likely.

**4.7.c Culture**

Cultural issues related to an Indigenous community were identified by some NGO workers as having an impact on relapse.

> *I see in regional centres, its a lot harder for them. The meeting place is now the pub, there is very little on offer for them in these communities and there's a death, there's constant funerals, you have to get them collectively to give up in a community like T....*
>
> *I think that's constant in any community. Any community I have seen if there is a funeral they will go to the pub, they don't go back to the house they go to the hotel.*

This worker noted that she was treated badly if she dressed down in a venue:

> *I used to go and cash $50 when I first started and down dress in the drop in centres and the way I was treated was absolutely appalling. Then I would go in the next day and ask for the Gaming Manager and say I would like to see that girl's licence and it was just really appalling and now I drop in unannounced but just to check on things.*

This quote reflected the environmental impacts on Indigenous communities and relapse:

> *In regional centres they really have no where else to go. If they want to go out, where are they going to go? They are welcome in the pokie area but not in the bistro as such. There are huge racial issues out there*

Relapse as a community group

A community relapse seemed to describe how one Indigenous community coped with a significant traumatic event. After a funeral for a young girl killed in a car accident the local Indigenous community congregated together to grieve at a local hotel after the funeral and gambled together:

> *I have seen people at funerals after ... there was a 14 year old girl in a car accident and that day the pokie area of the hotel was 3 or 4 deep in Aboriginal people, there wasn't one non Aboriginal person in there*

Furthermore this NGO worker suggested for Indigenous people to give up gambling you need to treat them in a community:

> *The meeting place is now the pub, there is very little on offer for them in these communities and there's a death, there's constant funerals, you have to get them collectively to give up (gambling implied) in a community ...*

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This worker raised important issues in relation to the Indigenous community and relapse in relation to environmental factors and the possibility of a community relapse. This needs further exploration.

### 4.7.d Religion

Religious beliefs were important for some clients as a protective factor against a relapse.

> *It's the meetings for me and the belief and God or whatever, higher power and you ask for help.* (NGO client)

> *Higher power is essential because if I understand that I myself can't do it and I can give it to a higher power then I have more trust, more faith and I can relax* (arousal reduced implied*) without struggling* (gambling implied) *because I know it's going to be ok.* (NGO client)

> *To have a faith which these groups help, that also is a big part of the healing process and keeping away from things* (gambling implied)*. I think it's important to have that faith or belief.* (NGO client)

*Hypothesis 12: All positive social support acts to reduce the vulnerability to relapse.*

*Hypothesis 13: Relationship disharmony and negative social support can trigger relapse.*

## 4.8 Intervention as a factor in relapse of problem gambling

Table 14. Intervention as a factor in relapse.

| Appendix | Allocated codes | Intervention |
|---|---:|---|
| 4.8.a. | 89 | Intervention |
| 4.8.b. | 26 | Motivation |
| 4.8.c. | 23 | Theoretical models |
| | **138** | **Total** |

### 4.8.a Intervention

The type and degree of treatment was an important factor for increasing resilience against a gambling relapse.

*Urge exposure and response prevention*

Participants from the SGTS client and worker focus groups described how treatment that focused on urge extinction reduced the risk of relapse.

> *C… obviously responded really well to this* (urge exposure), *eight years of another programme, although it helped with lots of things, with our relationship and other things, but it didn't get to the nitty gritty because whenever something happened and he couldn't cope he would be down and then it would be another year, whereas this programme is completely different* (wife of SGTS client)

For some counselling alone did not help one overcome gambling problems:

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*That's why this programme (urge exposure) worked wonders for me having had counselling before; this was obviously what triggered the best result for me without doubt.* (SGTS client)

*You have never had a relapse but you have had lots of other relapses before this programme, you have had counselling and you have relapsed a lot.* (SGTS client)

*We hypothesise that if people don't fully extinguish their urge to gamble then they are at greater risk of having a relapse.* (SGTS worker)

*I think in some situations it could spur people on to a relapse but in other situations after going through the course* (urge extinction implied) *and knowing and being aware of what they are having to deal with it probably should make you a bit stronger.* (SGTS client)

*I haven't had a lapse since I have done the programme.* (SGTS client)

*There is not even a coping mechanism for me, I no longer have that urge.* (SGTS client)

*Life skills*

It is important to teach clients to manage their lives:

*You aren't protecting people from anything you are teaching people how to manage their lives. That's just another one* (predictor implied). *I have got a parking ticket. I am near the pub so I will go and gamble. I may as well drink.* (SGTS worker)

*I think some of this seems to be pointing to those global life skills because those kind of fall by the wayside when a person is absorbed and consumed with gambling and I think one of these target areas in terms of therapy is to really foster and develop those life skills and restimulate things like the goal directed behaviour. So when those global life skills are in tact they won't get derailed by a simple setback* (lapse implied). *It depends what's primary and what's secondary. What's primary in terms of therapy, what you are targeting is not only addressing the problem of pathological gambling but you are also restimulating and broadening their repertoire in terms of those life skills.* (SGTS worker)

*I think that is an absolute crucial part of the not having a lapse for me, was learning the coping mechanisms.* (SGTS client)

*Pokies Anonymous*

Attending pokies anonymous was helpful in keeping people away from gambling:

*You come to the meetings and you listen to the stories of the people around the table and that's enough to drive you from not going to the machines, just to listen to their stories and what they go though and you can relate to it and it's true.* (NGO client)

*Understanding; we inspire each other; no judgement …. it keeps you on track.* (NGO client)

*It keeps you from getting complacent; you know you have been there and felt that yourself.* (NGO client)

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*Support is required to reduce relapse*

These NGO clients believed they could not overcome their gambling problems on their own. Support was considered an essential protective factor against relapse

> *I personally think left on my own I don't know that I could do it* (manage gamble implied)*, even though I decided to do it. I needed something else.* (NGO client)
> *Everyone helps each other. We do talk about confidentiality however everyone helps each other and inspire everyone. You are inspired by their courage, and what they have been through, one in particular, and I don't know whether I would have had the courage to go through it.* (NGO client)

*Counselling*

Counselling approaches were identified by some as helpful in reducing relapse.

> *I discuss with them what they want to achieve and I have one person who actually prefers the control and she has budgeted to allow herself $30 once a week. There have been a couple of relapses with her decision but overall she seems to be happy with the way she is going. The other ones want to abstain.* (NGO worker)

Not all participants believed that controlled gambling was possible:

> *for continuing to gamble but turning it back into a social activity instead of the one it is at the moment and quite often they will choose the controlled and then in about 3 months time they will say this is not working so I will give it up and that usually follows a lapse which quite often seems them putting a whole lot of money through, more than they would have previously in one episode and that frightens people.* (NGO worker)

> *A client said to me "I don't want to gamble at all" and I said I do understand that and I do understand that you have been wanting to for 10 years and this hasn't worked, this thinking of abstinence therefore we have to look at budgeting in your gambling otherwise you are ambiguous around your gambling and in denial and then when you get paid you blow a significant amount of your pay. I tend to talk to the clients first up cause they say I want to stop and I say we can achieve that eventually if that is what you want but I am warning you now that you will go back to gambling at some stage.* (NGO worker)

Some described counselling as a positive experience:

> *Today I am really grateful, I was about to see my counsellor and my daughter rang and said come to the Art Gallery and I thought yes I don't have to think about myself, I can think about my kids. Before it was all about what I wanted to do and it wasn't that I didn't love my kids it was just the time.* (NGO client)

**4.8.b Motivation**

Some believed they needed to hit rock bottom before anyone could help them:

> *You have to stop. You can't stop an addiction half way through. That person has to hit their bottom and you have to be on your knees before anybody can help you.* (NGO client)

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*That's pretty right, first you have to admit that you have got a problem and then you are half way there. You don't really turn yourself around until you have got no where else to turn to.* (NGO client)

*There are all sorts of different levels but you know yourself, there is nothing anyone can say or do to help you until you admit you have got a problem* (gambling implied). (NGO client)

But some clients did not want to stop gambling:

*and yes they will go and do something with a counsellor and she's a really nice lady and I stopped gambling and so I don't think I need to go any more so really they probably didn't want to stop.* (NGO worker)

*Yes and that comes in where people leave half way through (treatment implied) and they feel fine about it and they might not ever come back themselves.* (SGTS worker)

Some clients complete counselling too early thinking they have control of their gambling and relapse:

*sometimes our clients have counselling for a while and they have got quite good control and the they go away and perhaps finish counselling quite early and they often tend to relapse.* (NGO worker)

Clients who are not motivated with treatment are more likely to relapse:

*Well some people go through it* (treatment implied) *and all the measures are self-reporting measures, people tick the boxes and its all coming from some people we know, or maybe I am speaking for myself, I can tell I kind of get a gut feeling whether someone is giving you the stuff to put on the form that looks good, other people are just enthusiastic, you just know it. They are more likely to relapse, the gut feel ones, that aren't all that motivated that say yeah I am better now.* (SGTS worker)

*It's not just a matter of understanding the course; you have to want to not gamble.* (SGTS client)

*Yes I walked into the course and I hadn't gambled for eight months before I walked into the course but I wanted to make sure there was no chance of me ever going back again so I desperately wanted it out of me. But I can understand what you are saying about not being ready, it was very heavy and tiring and if you are not fully focussed on what you are doing you could get lost in it, in not wanting it. If you don't want it badly enough there is a huge potential to relapse there.* (SGTS client)

*Maybe men are less inclined to maintain the timeframe to extinguish the urge.* (SGTS worker)

### 4.8.c Theoretical models

Some participants believed gambling problems could be overcome.

*We hypothesise that if people don't fully extinguish their urge to gamble then they are at greater risk of having a relapse.* (SGTS worker)

This is crucial even in the presence of other co-morbidities:

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*If the person doesn't extinguish that response aside from all of the added disorders and co-morbidities, just that basic learning theory, if its not extinguished the person is vulnerable.* (SGTS worker)

*People can get through treatment.* (SGTS worker)

*There are a whole lot of things that can impact on the effectiveness of therapies. One of the challenges that we as workers have is trying; we know the model works* (urge exposure implied)*, we are pretty confident that it works.* (SGTS worker)

Some participants identified issues related to theoretical models and relapse.

*It's a behavioural thing to actually keep doing it and get further and further involved and you get further and further addicted and that's what's going on in your brain as well as your behaviour as a physiological thing as well as a cognitive thing as well as the behavioural thing so it's the whole element.* (SGTS worker)

*And what we know about through learning theories, that random reinforcement then the more likely they will develop that problem* (gambling implied) *with the random reinforcement.* (SGTS worker)

*It's a learned response, there's something going on.* (NGO worker)

*And of course even though there is not an identified thing there because things automatically click into place, its like a conditioned response* (gambling implied) *so there must have been something that made it happen but you can just click into that state.* (NGO worker)

*It's* (gambling) *a bit of brain washing I suppose.* (NGO client)

*The provision of treatment*

The type and degree of treatment was an important factor for increasing resilience against a gambling relapse. This section will review relapse in respect to different interventions used, the impact of motivation and the perceptions held by participants about the ability of problem gamblers to overcome gambling problems.

Effective treatment was considered important to reduce relapse:

*If treatment is effective, people don't relapse.* (SGTS client)

*To determine relapse would require obviously that they need to have sought treatment.* (SGTS client)

*I haven't had a lapse since I have done the programme* (urge exposure)*.* (SGTS client)
*That's why I am particularly interested in having predictors, like it's an early intervention thing and catching it before it* (relapse implied) *happens* (SGTS client)

It is important for clients to fully understand the therapeutic process so they can engage in and complete the treatment correctly:

*Do you think the way people comprehend themselves completing the course, like R... had a very good understanding of the actual mindset of the course* (urge exposure)

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*and the way it was structured and what was to be achieved, yet I know when you talk to me and you would say this person really hasn't got it, and yet some people might think I have done this 12 week course and think I am cured but they have not grasped the ground roots which they need to be building upon. I wonder whether that leads to some people not actually coping as well, then leading back to a relapse.* (SGTS client)

*And it's often couples who come in and they might have one session where they talk about a whole lot of stuff and they have got some new strategies and I am sure that they think now I know what to do and I will be alright now and their partner will get all the money.* (NGO worker)

This SGTS worker considered individual treatment style to be important for treatment delivery and outcome:

*If your style doesn't actually fit the gambling model they might get through the therapy but then they are back gambling a week later.*

The manner in which treatment was delivered by the worker was believed to be important for clients to engage in therapy:

*We are talking about the way in which we deliver the treatment.* (SGTS worker)

*Its not even just motivation. Someone could desperately want to overcome it and still not get or understand it or be able to conceptualise.* (SGTS worker)

Complexity of the client's presentation is also a factor in effective treatment:

*I was also thinking about that thing of other predictors of relapse in terms of maybe different treatments do fit different clients depending upon where they are at in relation to the gambling and that sort of stuff as well so if we are set in one particular way of working, and that way of working maybe the way of working that is best for the majority of clients but what about for those that its not and what about for those that do have lots of co-morbidities and complex social issues, is it still the best way of working?* (SGTS worker)

This SGTS worker suggested stress needed to be addressed or the client is at risk of relapse:

*It's not as simple as extinguish the urge and it's gone. There is a reason why people go and gamble in the first place, they don't get a problem by going there once, if people are going there to escape stress.*

*Participants' perceptions of outcomes from a gambling intervention and relapse*

The following examples highlight the different views held by participants in regards to the intervention used, the outcomes achieved and the risk for relapse inherent in these perceptions.

Treatment and resilience in the gambling environment

Interestingly some participants in the SGTS client and worker focus groups had a similar view that clients who have extinguished the urge to gamble would not be at risk in a gambling environment.

*You should actually be able to go to these venues; these areas and still function normally and not have an urge to go into them* (after urge extinction implied). *The*

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*way I see it is the number of venues shouldn't actually affect whether you start relapsing.* (SGTS worker)

Another participant suggested once the urge to gamble was extinguished it should not make a difference if gaming machines were in poorer areas:

> *If the urge is extinguished what difference does it make?* (SGTS worker)

An SGTS client's wife stated her husband no longer had a problem after doing the course. He could enter the gambling environments:

> *Yet they still to this day that G...''s course was still about avoiding the poker machines so you would organise a family luncheon and they would say: 'Oh no we can't go there, or just walk past there G..., the restaurant is over here', and it just gets to be a huge joke and G... has tried so many times to explain to them the way this course* (urge exposure) *is structured, he doesn't have a problem with them any more.*

Gambling as an addiction which is a lifelong affliction that needs vigilance and management

Some participants could not believe that cure was possible and that this belief may in fact lead to risk for relapse.

> *I like to get people to think that its always in the back of their mind that because in 10 years time if you think that you are cured then I think that you are more vulnerable* (relapse implied) *because you have forgotten and you walk into the pub and something is happening in your life and you think well I am alright because I haven't gambled for 10 years and I am cured but you are more at risk so if you think I must not do that because its too dangerous that's just something I feel* (NGO worker)

> *I tend to talk to the clients first up cause they say I want to stop and I say we can achieve that eventually if that is what you want but I am warning you now that you will go back to gambling at some stage* (relapse implied). (NGO worker)

> *I am concerned and that is with any addiction and that is with complacency, you forget.* (NGO client)

> *But the pokies, I have absolutely no control over. Except the only way you can control it is not to participate in it and I guess that describes me with pokies because I cannot participate in it because I cannot walk in.* (NGO client)

*Hypothesis 14: Interventions based on a belief in supportive approaches leads to a reduction in relapse.*

*Hypothesis 15: Motivation of a client to complete treatment reduces relapse.*

*Hypothesis 16: Urge exposure and response prevention based on the belief that gambling is a conditioned behaviour demonstrates that it can be treated to urge extinction and mastery of the urge, at which time relapse is reduced or eliminated.*

*Hypothesis 17: Interventions based on the belief that gambling is an addiction affect people for life*

*Hypothesis 18: The lifelong ongoing maintenance of vigilance is central to management of problem gambling for as long as the urge to gamble is present so that cognition remains in tact and the risk of relapse is reduced.*

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# THE DEFINITION AND PREDICTORS OF RELAPSE IN PROBLEM GAMBLING

# AN OBSERVATIONAL STUDY

Commissioned by

Gambling Research Australia (GRA)

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## EXECUTIVE SUMMARY

**Background**

There is a lack of theoretical understanding regarding treatment outcomes and relapse processes in problem gambling. The measurement of gambling-related problems is an ongoing challenge with no consistent definitions of relapse. A better understanding of relapse into problem gambling will help improve treatment retention, improve treatment outcomes and help predict those who are vulnerable to relapse.

Accounting for the complexities of relapse research, the project entitled **"Definition and Predictors of Relapse in Problem Gambling"** commissioned by Gambling Research Australia (GRA), has utilised the following methods of inquiry:

- A systematic literature review to examine factors that predict relapse in problem gamblers and alcohol and drugs of dependence.
- Focus groups with consumers, support persons, and treatment providers to develop key themes of relapse and identify predictors of relapse.
- A Delphi survey involving four rounds with national and international experts in problem gambling and related disorders. Results included significant consensus on key elements and predictors of relapse. Findings were presented and discussed at the International Think Tank for Problem Gambling, New Zealand, 2008.
- Results from the literature review, focus groups, and Delphi survey guided the design of the present observational study. The focus of this study was to model the odds of a study participant experiencing a relapse in problem gambling following a period of remission as a function of potential predicting variables.

**Methods**

Participants in the observational study were adults who, at baseline, were either treatment seeking or engaged in treatment or other support intervention/s for problem gambling. Participants were recruited from the following gambling help services in South Australia:

- Statewide Gambling Therapy Service (SGTS)
- Pokies Anonymous (PA)
- Gambling Helpline (GHL)
- Offenders Aid and Rehabilitation Service (OARS) Gambling Support Service
- Relationships Australia (RA).

Participants were recruited in the time period 24 March to 22 September 2008. Baseline measures were collected following consent to participate in the study. Follow-up measures comprised 1 and 3 months for all participants. Depending on recruitment date into the study, participants either completed a 6 month measure as their final follow-up, or a 6 month and a final 12 month measure by study completion at 3 March 2009.

To compare alternative measures of outcome, two independent assessments were conducted at each point in time: (1) the Victorian Gambling Screen (VGS) self-harm subscale, and (2) self-reported gambling behaviours during the previous 4 weeks from the follow-up time point.

Potential predictor variables of relapse included baseline demographics: gender, age, marital status, highest education level, employment status and living arrangement. Data for duration of gambling problem were also collected. Self-reported measurements of depression and anxiety, trait anxiety, gambling urge, gambling related thoughts, alcohol use, sensation

seeking traits, social support, and functional ability, were completed at each time point using validated scales.

**Results**

Key findings:

- 158 participants were recruited into the study and followed for between 6 and 12 months.
- Overall, there were 34 (21.5%) participants who completed baseline measures only, compared to 124 participants (78.5%) completing at least one follow-up measure. Baseline completers only were predominantly male, generally younger in age, had higher sensation seeking traits, and lower anxiety traits.
- When compared to previous normal population scores, baseline means for depression, state anxiety and stress were higher, and in the moderate severity range. Personality traits of anxiety were measured with the Trait Anxiety Inventory (TAI) to assess individual differences in the likelihood of a person experiencing state anxiety in a stressful situation. Mean scores for the TAI were higher than previous normative data in working adults, college and high school students by at least one standard deviation. Stratifying the VGS self-harm subscale with a cut-off at 21 found 94.9% ($n$ =150) participants were classified as problem gamblers at study commencement.
- Results for both outcome measures of VGS and gambling behaviour indicated that higher gambling urge scores and time were significant predictors of both relapse and continuing to problem gamble categories, when compared to individuals in remission.
- Outcome measures using the VGS indicated that participants self-reporting higher gambling related cognitions were significantly more likely to continue problem gambling or experience a relapse than a remission.
- Participants with higher scores on the Work and Social Adjustment Scale were more likely to continue problem gambling than experience a remission when outcomes were measured with the VGS and gambling behaviour.

**Conclusion**

The results support the findings of the literature review, Delphi process and particularly the focus group study that urge to gamble is a significant predictor of relapse in problem gambling. Similarly, erroneous beliefs and expectancies, i.e., cognitions, predicted those who did not achieve a remission and continued to gamble. This study has used statistical analyses with alternative outcome measures to compare explanatory models and consider relapse processes beyond a singular definition of relapse. Use of the two outcome measures gave strikingly similar results in terms of predictors. These results are of particular value for informing clinical practice and further research. Clinical services could assess and treat gambling urge to reduce the risk of relapse. In terms of prevention and early intervention, gamblers, venues and help seeking agencies could be educated in the existence of the urge and the importance of eliminating the urge to avoid the consequences of problem gambling. Research could investigate treatment interventions that reduce the urge and target cognitions in problem gamblers, and programs targeted towards relapse in problem gambling.

# PREDICTORS OF RELAPSE IN PROBLEM GAMBLING: OBSERVATIONAL STUDY

## 1. INTRODUCTION

Problem gambling and gambling-related behaviours are associated with significant social and economic negative consequences. Recent prevalence studies in the United States and Canada estimated 1-2% of the adult population met the diagnostic criteria for pathological gambling (Shaffer and Hall, 2001). Similar prevalence rates in Australia vary from less than 1% to approximately 2.5% across the states and territories (Delfabbro, 2007). Treatment protocols and treatment evaluation studies for problem gambling have increased in recent years (Ladoucer et al., 2001, Viets and Miller, 1997), however there is a paucity of empirical research examining the association between individual characteristics and treatment outcomes, including relapse processes (Daughters et al., 2003).

Ledgerwood and Petry (2006) identified potential relapse factors of problem gambling, including elements of a psychological, psychobiological, social, and environmental nature (Ledgerwood and Petry, 2006). Examples of previous studies investigating predictive factors in gambling relapse include neurocognitive measures of disinhibition and decision making (Goudriaan et al., 2007), affective states and stress reactivity (Daughters et al., 2005), and satisfaction with treatment, alcohol consumption at pre-treatment, and neuroticism (Echeburua et al., 2001). Strengths of prospective investigations of relapse factors include participants reporting on recent events at each follow-up, and self-reporting of experiences not influenced by the relapse episode itself (McKay et al., 2006).

Given that the studies referred to above aimed to identify individual characteristics associated with relapse, further research is required to identify and validate predictors with subsequent explanatory model development. This paper is part of a larger study into predictors of relapse in problem gambling. The purpose of the present investigation was to empirically identify predictors of relapse in problem gambling using a prospective observational study. Specifically, the goal was to model the odds of a study participant experiencing a relapse in problem gambling following a period of remission as a function of potential predicting variables. The design of this study was guided by results of a literature review, Delphi survey, and focus groups (see separate reports). These preliminary inquiries ensured the present study was grounded in the experiences of consumers and experts. The findings of this observational study may help identify appropriate interventions and support systems to reduce the negative health and social consequences of those who are vulnerable to relapse in problem gambling.

## 2. METHODS

### 2.1 Participants

The participants in this study were adults who, at baseline, were either treatment-seeking or engaged in treatment or other support intervention/s for problem gambling. Recruitment was initiated by research staff contacting gambling help services in South Australia with information about the study. All services contacted agreed to participate.

Numbers recruited by agencies for the study were influenced by a number of interrelated factors, including service size, restructuring of gambling help services in South Australia at the time of study recruitment, and duration of agency engagement with the study.
*Statewide Gambling Therapy Service (SGTS).* The Statewide Gambling Therapy Service provides services in the metropolitan area in Salisbury, Port Adelaide and the Southern Area of Adelaide, as well as in the following rural areas: Mount Gambier, Riverland, Berri, Murray

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Bridge, Port Pirie, Port Augusta, Port Lincoln, Whyalla and Ceduna. The treatment program offers both one-on-one therapy, and group therapy and employs cognitive behavioural approaches with an emphasis on eliminating the urge to gamble which is often out of control in problem gamblers. An inpatient program at Flinders Medical Centre is also available.

*Pokies Anonymous (PA).* Pokies Anonymous is a self-help peer support organisation based on similar principles to Alcoholics Anonymous, although, as the name suggests, PA is about helping people abstain from poker machine gambling only. PA has regular meetings in Adelaide that are anonymous and incorporate the 12 Step recovery goals.

*Gambling Helpline (GHL).*The Gambling Helpline is a free 24-hour counselling, information and referral service to assist people in South Australia with gambling related problems, or those affected by the gambling of others, including family members. The Gambling Helpline provides telephone counselling and support, crisis management and referral to face to face counselling services, verbal information and education, written information posted upon request, and relapse management.

*Offenders Aid and Rehabilitation Service (OARS) Gambling Support Service.* The OARS service supports lifestyle changes for people affected by problem gambling, who have been drawn into, or are at risk of entering the criminal justice system in South Australia. The service provides case work support, individual support, family support, court support, group programs, understanding, general counselling, and internal and external referrals as required.

*Relationships Australia (RA).* The Gambling Help Service team at Relationships Australia (SA) is a group of professionals with qualifications in counselling and social work and experience in helping people with gambling problems and relationship difficulties. Services include: working out if a person has a gambling problem, assessing family relationships, help with the impact of gambling on family relationships, financial counselling, and education by community seminars/ workshops, training for service providers, client support and information groups.

## 2.2 Design and procedure

We used a prospective cohort design to investigate predictors of relapse in problem gamblers, which followed participants over a 12 month time period. In accordance with the STROBE (Strengthening the Reporting of Observational Studies) guidelines (Vandenbroucke et al., 2007) Figure 1 presents the flow of participants through each stage of the study. The design of this present study was guided by the results of a literature review, focus groups, and a Delphi survey conducted as part of the larger study "Predictors of Relapse in Problem Gambling".

Participants were recruited in the time period 24 March to 22 September 2008. Baseline measures were collected following consent to participate in the study. Follow-up measures comprised 1 and 3 months for all participants. Depending on the date of recruitment participants either completed a 6 month measure as their final follow-up, or a 6 month and a final 12 month measure by study completion at 3 March 2009.

Response rates to mailed questionnaires have been shown to significantly improve with the provision of unconditional token "incentives" (Edwards et al., 2002). Research has also demonstrated that multiple contacts are more effective than any other strategy for improving responses to mailed surveys (Dillman, 2007). For this study each of the participants were mailed an unconditional honorarium voucher of ten dollars with 3 month, 6 month, and 12 month follow-up questionnaires, and a final voucher of twenty dollars on return of the 12 month questionnaire. A follow-up letter was sent to each participant one week after the mailing out of the questionnaire. The purpose of this letter was to thank those who had returned their questionnaires and act as a reminder for those who had not. At three weeks a further letter was sent only to participants with unreturned questionnaires. A final follow-up

occurred at five weeks with a telephone call for unreturned questionnaires. The purpose of the call was to see if the participant had any questions about the study and to offer the mailing out of a further set of questionnaires if needed. Also, if appropriate, the opportunity to complete questions on the phone was offered to the participant.

## 2.3 Outcome variables

Outcome status was represented by three unordered items (remission, relapse, and continuing to problem gamble). All participants were measured to be either in remission (non-problem gambling), or continuing to problem gamble at baseline. At follow-up time points of 1, 3, 6, and 12 months, outcome status was dependent on preceding assessments, and participants were classified as either in remission, continuing to problem gamble, or relapsed if the individual had returned to problem gambling following a remission period. To compare two alternative measures of outcome derived from the Delphi process, assessments were conducted at each point in time using: (1) the Victorian Gambling Screen (VGS) self-harm subscale, and (2) self-reported gambling behaviours as quantified by the Delphi definition of relapse.

## (1) VGS

The selection process of a validated measure to classify an individual's gambling status at each point in time was based on the final elements of relapse prioritised as "essential" and "very important" in the Delphi study (Table 1). Final selection of the Victorian Gambling Screen was based on the scales following properties: (i) items on the self-harm subscale relate to the person's experiences in the previous 4 weeks, and therefore enhance sensitivity to relapse and temporal associations, (ii) representation of all domains of elements in the final list (behavioural, cognitive, and interpersonal factors), and (iii) a validated cut-off point indicative of problem gambling. Of other validated instruments that classify problem or pathological gambling, neither the Canadian Problem Gambling Index (CPGI) nor the South Oakes Gambling Screen (SOGS) satisfied criteria (i) and (ii). Other potential measures of relapse such as the Gambling Urge scale (GUS) or Work and Social Adjustment Scale (WSAS) identified for some items in the elements of relapse in Table 1, were also potential predictors of relapse and therefore excluded.

The VGS is a self-reported questionnaire measuring the extent gambling behaviour has impeded the client's life. The screen comprises three sub-scales (enjoyment of gambling, harm to partner and harm to self), with a total of 21 items. For purposes of this study, only the harm to self sub-scale was used as an outcome measure. This sub-scale has been validated for use in Australia by Ben-Tovim, Esterman, Tolchard, Battersby and Flinders Technologies (2001). The harm to self sub-scale scores range from 0 = no harm to self to 60 = high harm to self. Concurrent validity indicates the scale correlates very highly with the South Oaks Gambling Screen (SOGS) (R = 0.97), but extends the score range. To determine outcome status for this study, a cut-off score of 21 or higher (Ben-Tovim et al., 2001) identified a participant as either continuing to problem gamble or relapsed. A score less than 21 identified a person to be in remission from problem gambling.

Figure 1. Participant flow chart for each stage of the study.

```
Potential participants having contact
with 5 gambling help services during
recruitment period
(n = 480)
```
→ 
```
Not assessed for eligibility*
  • GHL callers n = 128
```

```
Assessed for eligibility
(n = 352)
```
→
```
Excluded (Total = 194):
  3. Ineligible (n = 75)
     • Unsuitable mental status (n = 50)
     • Confidentiality concerns (n =15)
     • Limited English (n = 7)
     • Transient (n = 3)

  4. Eligible (n = 119)
     • Refused to participate (n = 21)
     • Administration error (n = 25)
     • Not interested (n = 47)
     • No reason given (n = 26)
```

```
Consented to participate
(n = 158)
```

```
Numbers participating at baseline data
collection (n = 158)
```
→
```
Losses to 1 month follow-up:
  • Study withdrawal (n = 5)
  • Unreturned questionnaires (n =63)
```

```
Numbers participating (n = 153) and
completing 1 month follow-up (n = 90)
```
→
```
Losses to 3 month follow-up:
  • Unreturned questionnaires (n =58)
```

```
Numbers participating (n = 153) and
completing 3 month follow-up (n = 95)
```
→
```
Losses to 6 month follow-up:
  • Unreturned questionnaires (n =61)
```

```
Numbers participating (n = 153) and
completing 6 month follow-up (n = 92)
```
→
```
Losses to 12 month follow-up:
  • Unreturned questionnaires (n =39)
```

```
Numbers participating (n = 87)** and
completing 12 month follow-up
(n = 48)
```

\* This is an approximate figure based on quarterly report figures for the Gambling Helpline from April to September, 2008.

\*\* Remaining participants (*n*= 66) received 6 month questionnaires as final follow-up.

## (2) Gambling behaviours

Based on the recommendation of the Think Tank expert panel in the Delphi study, a numerical definition of lapse and relapse was used as a guide to including an outcome measure of relapse based on gambling frequency. In considering issues of statistical analysis

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based on the expected sample size and time frame, it was decided to combine the lapse and relapse criteria by asking if participants had gambled once or greater than once more than their goal. At each follow-up time point participants self-reported their gambling behaviours from the previous 4 weeks. Three questions pertaining to outcome status were asked:

(i) Are you currently aiming to be abstinent from gambling? (Yes/No);

When answering "No" the person was asked:

(ii) To what level are you aiming to limit your gambling? (Once a week/Twice a week/Three or more times a week/daily).

(iii) How often did you gamble during the last 4 weeks? (Never/Once/Twice/Once a week/Twice a week/Three or more times a week).

Participants who answered "Yes" to question (i) and reported gambling activity in that time period were categorised as having either relapsed or continuing to problem gamble (depending on their previous assessment). Participants answering "No" to question (i) and reporting gambling activity in question (iii) that exceeded their aims in question (ii) were also categorised as either having relapsed or continuing to problem gamble. Otherwise participants were categorised as in remission.

Table 1. Final Delphi elements of relapse rated as "essential" and "very important" and selected rating scales.

| Element | Rating scale |
|---|---|
| **Behavioural** | |
| *My urge has returned and I can't control it* | Gambling Urge Scale (GUS) |
| *I tell lies to myself and others about my gambling* | Victorian Gambling Screen (VGS) |
| *I'm gambling more than I think I should* | VGS |
| *I have reduced alternative leisure activities to gambling activities* | Work and Social Adjustment Scale (WSAS) |
| *I have disengaged from non-gambling activities* | WSAS |
| **Cognitive** | |
| *I believe that gambling is an option to solve a problem* | Gambling Related Cognition Scale (GRCS) |
| *I'm thinking about gambling more than before (pre-occupation with gambling)* | VGS |
| *I am gambling again, I'm thinking about gambling and I feel like I want to gamble again* | GUS |
| **Interpersonal** | |
| *Gambling is affecting my work and social behaviour (e.g. Leaving work early to gamble…gambling during breaks)* | WSAS |
| *I have been emotionally or physically absent with significant others as a result of a pre-occupation with gambling* | WSAS |
| *I have withdrawn from supportive social networks* | WSAS |
| *I am experiencing personal conflict about or related to my gambling* | VGS, WSAS |

## 2.4 Predictor variables

Baseline demographic variables: gender, age, marital status, highest education level, employment status, and living arrangement. Data for duration of gambling problem and type of gambling was also collected.

The selection of validated measurement scales as predictor variables was based on the final predictors from the Delphi study rated as "very important" and "important" with strong group consensus (Table 2). Selected predictors were assessed as measurable in terms of validated self-rating scale properties, and minimal overlap within domains of psychological, psychobiological, and social and environmental factors.

Table 2. Final Delphi predictors of relapse and selected rating scales.

| Predictor | Rating scale |
|---|---|
| **Psychological** | |
| **distal-** | |
| *Impulsivity* | Arnett Inventory of Sensation Seeking (AISS) |
| *Anxiety traits* | Spielberger Trait Anxiety Inventory (STAI) |
| *Sensation seeking* | AISS |
| **proximal** | |
| *Anxiety states* | Depression Anxiety Stress Scale (DASS) |
| *Recurrence of cognition (erroneous)* | Gambling Related Cognition Scale (GRCS) |
| *Social isolation* | Multidimensional Scale of Perceived Social Support (MSPSS) |
| **Psychobiological** | |
| **distal-** | |
| *Affective disorder, anxiety disorder and substance use* | DASS, STAI, Alcohol Use Disorders Identification Test (AUDIT) |
| **proximal-** | |
| *Negative affective state* | DASS |
| *Stress reactivity* DASS | |
| *Affective instability* | DASS |
| *Intoxication with drugs or other substances* | AUDIT |
| *Internal cues leading to physiological changes* | Gambling Urge Scale (GUS) |
| *Environmental cues leading to physiological changes* GUS | |
| **Social and Environmental** | |
| **proximal-** | |
| *Lack of access to supportive social support networks* MSPSS | |
| *Lack of involvement with supportive social networks* Work and Social Adjustment Scale (WSAS) | |

All self-report measures were completed by participants at five points in time: baseline, 1 month, 3 months, 6 months and 12 months. A summary of each measure follows.

**Depression and anxiety**

The Depression Anxiety and Stress Scale (DASS-21) is a 21 item self-report questionnaire that measures the experience of depression, anxiety or stress, for example "I couldn't seem to experience any positive feeling at all". The client is required to rate the degree to which the statements applied to them during the past week on a 1-4 scale ("not at all" to "most of the time"). Final scores indicate levels of depression (0-9 = normal to 28+ = extremely severe), stress (0-7 = normal to 20+ extremely severe) and anxiety (0-14 = normal to 34+ = extremely severe). Normal data has been collected for Australian populations and the DASS has been validated against other depression and anxiety inventories (Lovibond and Lovibond, 1995).

**Trait anxiety**

The Trait Anxiety Inventory form Y-20 is a 20 item self-report measure designed to record levels of trait anxiety. Studies have shown the scale has good reliability measured by test-retest coefficients and sound validity (Spielberger et al., 1983). Clients are required to rate the

frequency at which they experience certain emotional and cognitive states using a four-point scale (1 = almost never, 2 = sometimes, 3 = often, 4 = almost always). Items include statements such as "I feel rested" and "I am happy". The score from each question is summed to create a total ranging from 20-80.

## Urge

The Gambling Urge Scale (GUS) is a self-report questionnaire measuring the extent of gambling urge. The scale consists of six items rated on a Likert (1-7) scale, including statements such as "I crave a gamble right now" and "All I want to do is gamble". A final score is generated as a total of the response to each item. Higher scores indicate greater urges to gamble. Research into concurrent, predictive and criterion-related validity of the GUS suggests the GUS is a valid and reliable instrument for assessing gambling urges among non-clinical or non-treatment seeking gamblers. Predictive validity of problem gambling has been shown using the GUS as well as the ability to differentiate between non-problem gamblers and problem gamblers (Raylu and Oei, 2004b).

## Cognitive

The Gambling Related Cognition Scale (GRCS) is a 23 item self-report questionnaire that records common thoughts associated with problem gambling. Statements include items such as "Praying helps me win" and "I will never be able to stop gambling". Clients use a seven-point Likert scale (1 = strongly disagree, 2 = moderately disagree, 3 = mildly disagree, 4 = neither agree nor disagree, 5 = mildly agree, 6 = moderately agree, 7 = strongly agree) to indicate how much they agree with each of the statements. The final score is created by adding the values gained from the items, with a higher score reflecting more gambling-related cognitions. A comparison with the South Oakes Gambling screen indicated the scale has good psycho-metric properties in measuring gambling cognitions in a non-clinical sample (Raylu and Oei, 2004a).

## Alcohol use

The Alcohol Use Disorders Identification Test (AUDIT): Self-Report Version is a non-diagnostic ten item questionnaire indicating hazardous alcohol use. Individuals are required to rate how frequently they engage in certain activities on a scale of 1-5. Questions 1 to 3 measure quantity and frequency of alcohol use, questions 4 to 6 measure possible dependence on alcohol and questions 7 to 10 measure alcohol-related problems. Final scores range from 0 indicating abstainer, >8 indicating low risk alcohol use, 8+ indicating risky or harmful alcohol use, 13+ indicating alcohol dependence is likely. According to a recent review of studies reporting the psycho-metric properties of the AUDIT, the scale reveals specifics and sensitivities superior to those of other self-report screening measures and good test-retest reliability and internal consistency (Reinert and Allen, 2002).

## Sensation seeking traits

The Arnett Inventory of Sensation Seeking (AISS) is a 20 item self-report questionnaire that measures sensation seeking personality traits. Within the tool there are two subscales, intensity and novelty, consisting of 10 items each. The scale has been shown to be free from social desirability bias (Roth, 2003). Clients are required to respond to 20 statements such as "I can see how it would be interesting to marry someone from a foreign country" and "when I listen to music I like it to be loud" using a scale of A "describes me very well" through to D "does not describe me at all". The final score ranges from 20-80 with a higher score reflecting higher levels of sensation seeking.

## Social support

The Multidimensional Scale of Perceived Social Support is a 12 item self-report questionnaire containing three sub-scales (significant other, family and friends sub-scales). Questions include items such as, "my family really tries to help me" and "there is a special person in my life who cares about my feelings". The client responds to twelve statements using a 0-7 scale ranging from "very strongly disagree" through to "very strongly agree". The final score for the total and each sub-scale is the average of relevant questions and ranges from 0-7. Research has shown the MSPSS is psychometrically sound, with good reliability, factorial validity, and adequate construct validity (Zimet et al., 1988).

## Functional ability

The Work and Social Adjustment Scale is a self-report questionnaire used to measure a patient's perspective of their functional ability/ impairment. The scale contains five items that explore the degree to which the client's gambling problem affects their ability to function in the following areas: work, home management, social leisure, private leisure and family and relationships. Each question is answered using a 1-7 likert scale ("not at all" to "very severely"), with higher scores corresponding to a higher degree of severity. Research into the validity of the scale suggests that WSAS correlates closely with the severity of depression and obsessive-compulsive disorder symptoms at 0.76 and 0.61 and is sensitive to patient differences and change following treatment (Mundt et al., 2002).

## 2.5. Statistical methods

All statistical analyses were conducted using Stata 10.0 (StataCorp., 2008). An initial data analysis was carried out to check for data quality, including allowable ranges and errors. Univariate analyses were performed on all variables to identify missing data and to clarify data structure. Baseline characteristics were compared between participants completing baseline measures only and participants with at least one follow-up measure using *t tests* for continuous variables, and $\chi^2$ tests of independence for categorical variables. A significance level of 5% was used.

Cronbach's alpha coefficients were calculated for baseline measurement scores to assess internal consistency or the extent to which items in a questionnaire (sub) scale were correlated. A low Cronbach's alpha indicated a lack of correlation between the items in a scale. Alpha values in the range 0.7 – 0.9 are considered to indicate good internal consistency (Nunnally and Bernstein, 1994).

For statistical modelling of predictors of relapse we chose mixed-effects multinomial logistic regression to handle correlated observations from repeated measures within subjects, and the unordered or nominal response categories of remission, relapse, and continuing to problem gamble. Mixed-effects regression models do not assume equal time intervals for all participants, and therefore incomplete data is not excluded. The multinomial logistic regression fits sub-models simultaneously and compares them to a referent category (Long and Freese, 2006). In this study the selected referent category was "remission", and sub-models were fitted for "relapse" and "continuing to problem gamble". Repeated measure analysis using mixed-effects models in health research is increasingly becoming a preferred method over traditional approaches such as univariate and multivariate repeated-measures analysis of variance (Gueorguieva and Krystal, 2004). Mixed-effects regression has been regarded as a useful technique for analysing longitudinal data on relapse (Hedeker and Mermelstein, 1996). Recent developments in mixed-effects analysis have included the ability to model nominal response variables (Hedeker, 2003). Models were fitted using the user-written program gllamm (generalised linear latent and mixed models) in Stata 10.0.

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Variable selection for a mixed-effects multinomial logistic regression model commenced with univariate analyses. Using Wald statistics and *P*-values for each univariate model, variables were selected for model advancement based on *P* < 0.25. This conservative approach was to allow the inclusion of potentially important variables that otherwise may be excluded with traditional values such as *P* < 0.05 (Hosmer and Lemeshow, 2000). Categorical variables with low or zero cell counts in contingency tables were modified as needed. Pairwise correlations among the significant variables were assessed for collinearity: if the Pearson correlation coefficient *r* was > 0.75 then the variable having the highest correlation with the response variable was selected. If both variables had similar correlations with the response variable then selection criteria were based on findings from the literature review, Delphi study, and focus groups conducted prior to this study.

An initial "full" model was created with variables significant at *P* < 0.25 and not collinear. Using backward manual elimination methods, variables with the least significant Wald statistic were removed from the model. A comparison of log likelihood values between the fitted model and the full model was conducted for each variable removed. Also, Akaike's information criterion (AIC) and Schwarz's Bayesian information criteria were examined. Both AIC and BIC take into account the statistical goodness of fit and the number of predictor variables in the model. Generally, lower values of an index indicate a better fit of the data when comparing two models. The process of removing variables one at a time was repeated until there was a discernible difference in the log likelihood and information indices between competing models. The goal was to construct a model with the fewest number of variables without compromising an adequate fit of the data.

To interpret effect sizes of significant variables at *P* < 0.05 in the final model, odds ratios and confidence intervals were calculated. The odds are a way of representing probability: for this study it was the ratio of the probability of experiencing one outcome category (relapse or continuing to gamble) over the probability of experiencing the reference category of remission.

## 3. RESULTS

### 3.1 Participant flow

Of the 158 consented participants at baseline, 106 (67.1%) were referred from SGTS, 31 (19.6%) from GHL, 11 (7%) from PA, 5 (3.2%) from RA, and 5 (3.2%) from OARS. Overall, median time for participants enrolment in the study was 8.38 months with 50 % of participants having times between 7 and 9.57 months(IQR= 2.57 months) and 25% less than 7 months. Patterns of completed measures for points in time included 116 (73.4%) with at least a 3 month follow-up, and 99 (62.7%) with at least a 6 month follow-up. Descriptive statistics for follow-up measure completion times are presented in Table 3.

Table 3. Descriptive statistics of follow-up completion times.

| Follow-up time | *n* | Median (IQR)* |
|---|---|---|
| 1 month | 90 | 1.23 (0.4) |
| 3 months | 95 | 3.23 (0.5) |
| 6 months | 92 | 6.4 (0.7) |
| 12 months | 48 | 9.2 (1.2) |

Abbreviation: IQR, Inter-quartile range.
*Expressed as months.

Overall, there were 34 baseline completers only (21.5%), with 124 participants (78.5%) completing at least one follow-up measure. There were significantly more males with baseline scores only (28 males = 82.4%) compared to females (6 females = 17.6%), ($\chi^2_1$ = 14.21; *p* <

0.01). There were significant differences on age, AISS, and TAI mean scores (see Table 2). There were no significant differences on the remaining measures.

Table 4. Differences between baseline completers only and participants with at least one follow-up measure.

| Variable | Baseline only ≥ mean ± SD[a] | At least 1 follow-up mean ± SD[b] | $t\,(p)$[c] |
|---|---|---|---|
| Age | 38.5 ± 11.42 | 45.51 ± 12.94 | -2.86 (<0.01) |
| GUS | 14 ± 8.62 | 14.21 ± 12.03 | -0.09 (0.93) |
| WSAS | 16.07 ± 9.24 | 16.02 ± 9.90 | 0.03 (0.98) |
| DASS-21 | 24.85 ± 16.42 | 28.86 ± 16.64 | -1.25 (0.21) |
| MSPSS | 52.13 ± 22.01 | 47.99 ± 22.12 | 0.97 (0.33) |
| VAGS | 40.97 ± 10.27 | 39.85 ± 11.80 | 0.50 (0.61) |
| AUDIT | 7.82 ± 8.90 | 5.59 ± 6.98 | 1.55 (0.12) |
| AISS | 49.37 ± 7.50 | 45.99 ± 7.56 | 2.31 (0.02) |
| GRCS | 64.98 ± 23.73 | 65.64 ± 25.47 | -0.14 (0.89) |
| TAI | 50.62 ± 10.26 | 54.75 ± 11.08 | -1.95 (0.05) |

[a] $n = 34$. [b] $n = 124$. [c] Two-tailed.
Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; DASS-21, Depression Anxiety and Stress Scale; MSPSS, Multidimensional Scale of Perceived Social Support; VGS, Victorian Gambling Screen; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory.

## 3.2 Baseline data

To assess internal consistency of questionnaires completed by participants at baseline, Cronbach alpha coefficients were calculated (Table 5). Inter-item alpha coefficients ranged from 0.69 to 0.96 for tests on all items in each scale. Most alpha values indicated that questionnaires comprised of adequate internal properties, although the AISS ($\alpha = 0.69$) and to a lesser extent the WSAS ($\alpha = 0.84$) were at the lower end of the range. It has been recommended that measurements on individuals should achieve a minimum reliability of 0.90 and a desirable standard of 0.95 (Terwee et al., 2007).

Table 5. Cronbach's alpha coefficients for questionnaires completed by participants at baseline.

| Measure sub-scale | Cronbach's alpha ($\alpha$) |
|---|---|
| GUS | **0.93** |
| DASS-21 | **0.96** |
| depression | 0.93 |
| anxiety | 0.89 |
| stress | 0.93 |
| MSPSS | **0.94** |
| significant other | 0.94 |
| family | 0.93 |
| friends | 0.92 |
| VGS self-harm | **0.90** |
| AUDIT | **0.91** |
| AISS | **0.69** |
| novelty | 0.41 |
| intensity | 0.66 |
| GRCS | **0.91** |
| gambling expectancies | 0.77 |
| illusion of control | 0.70 |
| predictive control | 0.81 |
| inability to stop gambling | 0.82 |
| interpretive bias | 0.67 |
| TAI | **0.92** |
| WSAS | **0.84** |

Abbreviations: GUS, Gambling Urge Scale; DASS-21, Depression Anxiety and Stress Scale; MSPSS, Multidimensional Scale of Perceived Social Support; VGS, Victorian Gambling Screen; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of Sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory; WSAS, Work and Social Adjustment Scale

Demographic and clinical characteristics of the study cohort are presented in Table 6. When compared to previous normal population scores (Lovibond & Lovibond, 2004) baseline DASS means where higher for the depression, anxiety, and stress scales, and in the moderate severity range. The distribution of baseline scores across severity ranges for the depression subscale was 21.5 % ($n = 34$) in the normal range, 7.6 % ($n = 12$) in the mild range, 17.7 % ($n = 28$) in the moderate range, 14.6 % ($n = 23$) in the severe range, and 38.6 % ($n = 61$) were in the extremely severe range. Anxiety scores were distributed as 37.3 % ($n = 59$) in the normal

range, 3.2 % (*n* = 5) in the mild range, 20.3 % (*n* = 32) in the moderate range, 10.1 % (*n* = 16) in the severe range, and 46 % (*n* = 29.1) were in the extremely severe range. Stress scores were distributed as 33.5 % (*n* = 53) in the normal range, 10.1 % (*n* = 16) in the mild range, 22.2 % (*n* = 35) in the moderate range, 12.7 % (*n* = 20) in the severe range, and 21.5 % (*n* = 34) were in the extremely severe range. Mean scores on the TAI were higher than previous normative data in working adults, college and high school students (Speilberger et al., 1983) by at least one standard deviation. The distribution of baseline scores across severity categories of the AUDIT were 24.1 % (*n* = 38) for abstainers, 46.8 % (*n* = 74) low risk alcohol use, 14.6 % (*n* = 23) risky or harmful alcohol use, and 14.6 % (*n* = 23) alcohol dependence likely. Stratifying the VGS self- harm subscale with a cut-off at 21 (Ben-Tovim et al., 2001) found 94.9% (*n* =150) participants were classified as problem gambling at study commencement.

Table 6. Demographic and clinical characteristics of 158 problem gamblers*.

| Variable | Value |
|---|---|
| Age, mean ± SD, y | 44 ± 12.92 |
| Male sex | 85 (54) |
| Marital status | |
| Married/defacto | 63 (40) |
| Single | 55 (35) |
| Separated | 33 (21) |
| Widowed | 7 (4) |
| Highest education level | |
| Primary school | 2 (1) |
| High school | 88 (56) |
| TAFE/Trade qualification | 43 (28) |
| University degree | 24 (15) |
| Employment | |
| Full-time | 58 (37) |
| Part-time | 28 (18) |
| Not working | 50 (31) |
| Retired | 17 (11) |
| Student | 5 (3) |
| Living arrangement | |
| Alone | 36 (24) |
| Couple with dependent children | 29 (19) |
| Couple without dependent children | 38 (25) |
| Single parent | 15 (10) |
| Living with parents | 24 (16) |
| Sharing | 11 (7) |
| Primary form of gambling | |
| Gaming machines | 138 (87) |
| Duration of gambling problem | |
| < 2 y | 31 (20) |
| 2 - 5 y | 36 (23) |
| > 5 y | 87 (57) |
| Clinical measures, mean ± SD[a] | |
| GUS | 14.16 ± 11.52 |
| WSAS | 16.03 ± 9.73 |
| DASS-21: depression | 10.76 ± 6.35 |
| DASS-21: anxiety | 6.63 ± 5.65 |
| DASS-21: stress | 10.60 ± 6.01 |
| MSPSS | 48.88 ± 22.08 |
| VGS: self-harm subscale | 40.09 ± 11.46 |
| AUDIT | 6.07 ± 7.46 |

| | |
|---|---|
| AISS | 46.72 ± 7.65 |
| GRCS | 65.50 ± 25.03 |
| TAI | 53.86 ± 11.01 |

Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; DASS-21, Depression Anxiety and Stress Scale; MSPSS, Multidimensional Scale of Perceived Social Support; VGS, Victorian Gambling Screen; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of Sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory.

*Data are presented as number (percentage) unless otherwise indicated. Percentages not always based on 158 participants owing to missing data.

[a]Refers to scores collected at baseline.

### 3.3 Regression models for the Victorian Gambling Screen

The focus of this section is to model the odds of a study participant experiencing a relapse in problem gambling following a period of remission as a function of potential predicting variables. Using the Victorian Gambling Screen individuals gambling status was classified at baseline and at 1, 3, 6, and 12 months follow-up. Specifically, at each time-point an individual's gambling status was classified as either remission, relapse, or continuing to problem gamble.

The observed sample sizes and response proportions by outcome category of remission, relapse, or continuing to problem gamble as measured with the Victorian Gambling Screen are presented in Table 7. These observed proportions indicate a general increase in remission and relapse across time, and a corresponding decrease in the proportion of participants continuing to gamble. There is some attrition at each time point; attrition rates of 44.9 % at 6 months and 46 % at 12 months (based on $n = 87$: see Figure 1). However, 73.4 % of participants completed at least a 3 month assessment. Line plots of the proportions for each outcome category across time are presented in Figure 2.

Table 7. Gambling status as measured with the Victorian Gambling Screen across time: response proportions and sample sizes ($n$).

| Outcome | Time-point | | | | |
|---|---|---|---|---|---|
| | Baseline | 1 month | 3 months | 6 months | 12 months |
| remission | 0.051 | 0.375 | 0.418 | 0.552 | 0.617 |
| relapsed | 0 | 0.013 | 0.055 | 0.115 | 0.170 |
| continuing | 0.949 | 0.612 | 0.527 | 0.333 | 0.213 |
| $n$ | 158 | 80 | 91 | 87 | 47 |

Figure 2. Proportion versus time for outcome status using the Victorian Gambling Screen.
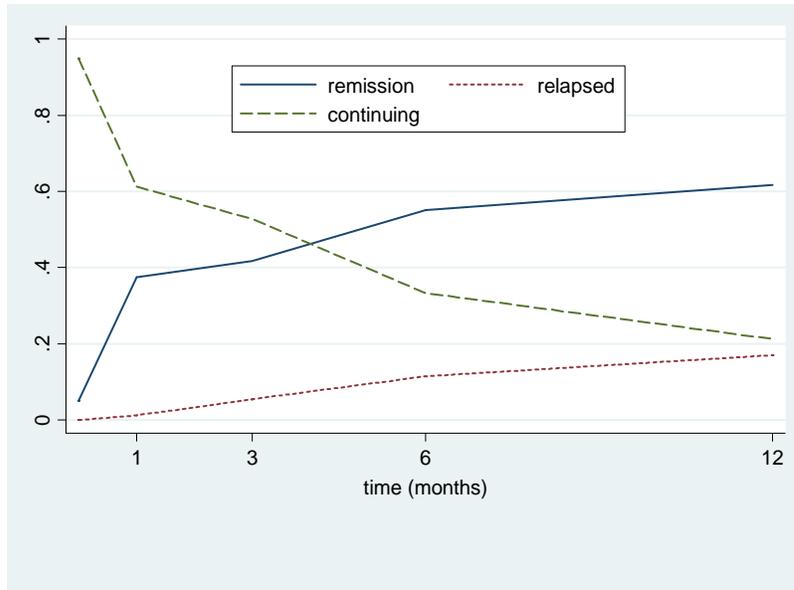


The development of a statistical model to determine predictors of gambling status commenced with the selection of variables from univariate models. Results of the univariate mixed-effects multinomial regression analysis describing each variable's association with gambling status are presented in Table 8. With three of the demographic variables (highest education level, employment, and living arrangement) and duration of problem gambling there were low or zero cell counts when cross-classified with each category of gambling status. To increase cell counts, categories were combined within each variable. For the variable "highest education level", the categories primary and high school were combined, and trade certificate, TAFE certificate/ diploma and university degree were combined, resulting in a variable comprising of "school" versus "post-school" highest education level. The number of levels for the variable "living arrangement" was collapsed and a modified variable was created with "living alone" versus "living with someone else". For the variable "employment", the categories were combined to create a modified variable of "not working" versus "working", which included full-time and part-time workers. Categories for the variable "duration of problem gambling" were combined to create a variable of "duration < 2 years" versus "duration ≥ 2 years".

The variables that were not associated with gambling status outcome (Wald's test $P > 0.25$) were marital status, highest education level, employment status and duration of problem gambling. Collinearity was found between measures DASS-21 and TAI (Pearson correlation coefficient $r = 0.76$). As both variables had similar associations with gambling status the decision to include the DASS-21 variable was guided by findings from the Delphi study. The ratings of predictors of relapse in the Delphi study indicated a number of elements of negative affectivity to have higher importance than anxiety and therefore the TAI variable was not included in subsequent models.

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Table 8. Univariate mixed-effects multinomial logistic regression analyses describing each variable's association with outcome patterns of response as measured with the Victorian Gambling Screen.

| Variables | Wald statistic | P-value | Advanced[a] to final model? |
|---|---|---|---|
| time | 80.47 | < 0.001 | YES |
| Demographic | | | |
| age, years | 5.12 | 0.077 | YES |
| gender | 4.39 | 0.111 | YES |
| marital status | 7.36 | 0.499 | |
| highest education level | 2.06 | 0.358 | |
| employment | 0.46 | 0.794 | |
| living arrangement | 3.35 | 0.188 | YES |
| duration of gambling problem | 1.98 | 0.372 | |
| Clinical measures | | | |
| GUS | 53.75 | < 0.001 | YES |
| WSAS | 62.02 | < 0.001 | YES |
| DASS-21 | 45.26 | < 0.001 | YES |
| MSPSS | 11.72 | 0.003 | YES |
| AUDIT | 9.19 | 0.010 | YES |
| AISS | 4.50 | 0.150 | YES |
| GRCS | 60.58 | < 0.001 | YES |
| TAI[b] | 36.29 | < 0.001 | |

Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; DASS-21, Depression Anxiety and Stress Scale; MSPSS, Multidimensional Scale of Perceived Social Support; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of Sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory.
[a] Advanced to final model if $P < .25$.
[b] Collinearity with DASS-21, therefore did not advance to final model.

The results of the final mixed-effects multinomial logistic regression model are presented in Table 9 (Wald's statistic and P-value). Time (by month), gambling urge (GUS), work and social functionality (WSAS), alcohol use (AUDIT), and gambling related cognitions (GRCS) remained statistically significant ($P < 0.05$) in the final model. A decrease in information indices from the initial model comprising all variables significant at $P < 0.25$ from univariate analyses (AIC = 326.69, BIC = 430.47) to the final model (AIC = 316.211, BIC = 389.89) indicated the final model provided a better fit of the data. The small decrease in the log likelihood from the initial to the final model of approximately 3 (LL = -136.35 and -139.11 respectively) provided evidence that variables removed were not needed to improve overall model goodness-of-fit.

Table 9. Final model (mixed-effects multinomial logistic regression) for outcome measured with the Victorian Gambling Screen.

| Variable | Wald statistic | P- value |
|---|---|---|
| time | 25.98 | < 0.001 |
| Demographic | | |
| living arrangement | 4.35 | 0.114 |
| Clinical measures[a] | | |
| GUS | 13.13 | 0.001 |

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| | | |
|---|---|---|
| WSAS | 10.86 | 0.004 |
| MSPSS | 2.61 | 0.272 |
| AUDIT | 7.84 | 0.020 |
| GRCS | 15.28 | 0.001 |

Final model describing variables associated with the outcome patterns of response with a $P < .05$ on the Wald test for overall significance with remission as base category.

Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; MSPSS, Multidimensional Scale of Perceived Social Support; AUDIT, Alcohol Use Disorders Identification Test; GRCS, Gambling Related Cognition Scale.

[a] Higher scores indicate greater problem gambling and related characteristics.

Table 10 describes the association between the predictor variables in the final equation and patterns of relapse or continuing to gamble measured with the Victorian Gambling Screen, while holding all other variables constant, with odds ratios and 95 % confidence intervals. The following section provides an interpretation of each of these variables.

### 3.3.1 Time

For each one month change in time the odds of participants relapsing over remission increased by 23 % while holding all other variables constant. In terms of confidence intervals the increase in odds of relapse over remission could be as low as 3 % or as high as 47 %. The odds of continuing to gamble over remission decreased by 24 % with each one month change in time and could be as low as 12 % or as high as 34 % .

### 3.3.2. Gambling Urge

The odds of participants experiencing a relapse over remission for each one unit increase on the Gambling Urge Scale increased by 29 % and could be as low as 12 % or as high as 49 % while holding all other variables constant. For each one unit increase on the Gambling Urge Scale the odds of participants continuing to gamble over remission increased by 20 % and could be as low as 7 % or as high as 35 %.

### 3.3.3. Gambling Related Cognitions

For each one unit increase on the Gambling Related Cognitions Scale the odds of participants experiencing a relapse over remission increased by 6 % and could be as low as 1 % or as high as 12 %. The odds of continuing to gamble over remission with each one unit increase on the Gambling Related Cognitions Scale increased by 8 % and could be as low as 4 % or as high as 13 %.

### 3.3.4. Work and Social Adjustment

For each one unit increase on the Work and Social Adjustment Scale the odds of a participant continuing to gamble over remission increased by 13 % and could be as low as 3 % or as high as 24 %.

### 3.3.5. AUDIT

While the AUDIT variable was significant in the overall regression model ($P = 0.02$) there was no significant effect in either the relapse or continuing to gamble categories when compared to the remission category.

Table 10. Mixed-effects multinomial logistic regression model (variables significant overall at $P < .05$) describing the association between variables and patterns of response measured with the Victorian Gambling Screen.

| | OR[a] (95% CI) | |
|---|---|---|
| Variable | Relapse vs. Remission | Continuing vs. Remission |
| Time | 1.23(1.03-1.47)* | 0.76(0.66-0.88)* |
| living arrangement | 1.98(0.41-9.65) | 0.49(0.17-1.40) |
| Gambling Urge Scale (GUS) | 1.29(1.12-1.49)* | 1.20(1.07-1.35)* |
| Multidimensional Scale of Perceived Social Support(MSPSS) | 1.00(0.96-1.04) | 1.02(0.99-1.05) |
| Gambling Related Cognitions Scale (GRCS) | 1.06(1.01-1.12)* | 1.08(1.04-1.13)* |
| Alcohol Use Disorders Identification Test (AUDIT) | 1.09(0.98-1.22) | 0.96(0.88-1.04) |
| Work and Social Adjustment Scale (WSAS) | 0.93(0.78-1.10) | 1.13(1.03-1.24)* |

* 95 % confidence interval significant at $P < .05$
[a] Odds Ratio $= e^{\beta}$

## 3.4 Regression models for changes in gambling behaviour

The focus of this section is to model the odds of a study participant experiencing a relapse in problem gambling, with changes in gambling behaviours as the outcome measure. Specifically, at each time-point an individual's gambling status was classified as either remission, relapse, or continuing to problem gamble according to their gambling behaviours. Potential predictors of relapse were investigated by following a similar modelling strategy to Section 3.3.

The observed sample sizes and response proportions by outcome category of remission, relapse, or continuing to problem gamble as measured by participants gambling behaviours are presented in Table 11. These observed proportions indicate participants in remission increase from baseline to one month and then level-out for the remaining time-points. Proportions of participants observed in the relapse category increase across time, and decrease for the continuing to gamble category. Line plots of the proportions for each outcome category across time are presented in Figure 3.

Table 11. Gambling status as measured by behavioural changes across time: response proportions and sample sizes ($n$).

| Outcome | Time-point | | | | |
|---|---|---|---|---|---|
| | Baseline | 1month | 3 months | 6 months | 12 months |
| remission | 0.051 | 0.488 | 0.468 | 0.500 | 0.533 |
| relapsed | 0 | 0.012 | 0.117 | 0.211 | 0.289 |
| continuing | 0.949 | 0.500 | 0.415 | 0.289 | 0.178 |
| $n$ | 158 | 86 | 94 | 90 | 45 |

Figure 3. Proportion versus time for outcome status using gambling behaviour measures.
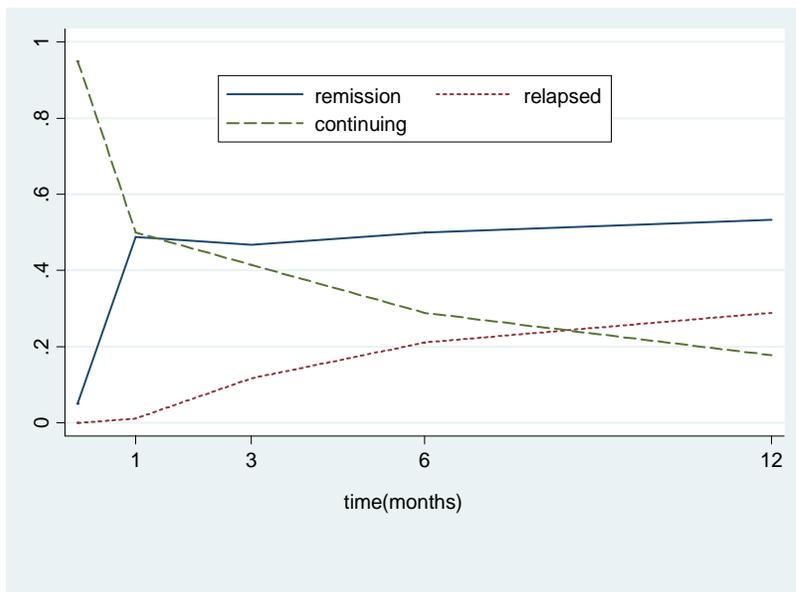
The development of a statistical model to determine predictors of gambling status commenced with the selection of variables from univariate models. Results of the univariate mixed-effects multinomial regression analysis describing each variable's association with gambling status are presented in Table 12. With three of the demographic variables (highest education level, employment, and living arrangement) and duration of problem gambling there were low or zero cell counts when cross-classified with each category of gambling status. To increase cell counts, categories were combined within each variable. For the variable "highest education level", the categories primary and high school were combined, and trade certificate, TAFE certificate/ diploma and university degree were combined resulting in a variable comprising of "school" versus "post-school" highest education level. The number of levels for the variable "living arrangement" was collapsed by creating a modified variable with "living alone" versus "living with someone else". For the variable "employment", the categories were combined to create a modified variable of "not working" versus "working" which included full-time and part-time workers. Categories for the variable "duration of problem gambling" were combined to create a variable of "duration < 2 years" versus "duration ≥ 2 years".

The variables that were not associated with gambling status outcome (Wald's test $P > 0.25$) were marital status, employment status, living arrangement, duration of problem gambling and the AUDIT. Collinearity was found between measures DASS-21 and TAI (Pearson correlation coefficient $r = 0.76$). As both variables had similar associations with gambling status the decision to include the DASS-21 variable was guided by findings from the Delphi study. The ratings of predictors of relapse in the Delphi study indicated elements of negative affectivity to have higher importance than anxiety and therefore the TAI variable was not included in subsequent models.

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Table 12. Univariate mixed-effects multinomial logistic regression analyses describing each variables association with outcome patterns of response as measured by behavioural changes in gambling.

| Variables | Wald statistic | *P*-value | Advanced[a] to final model? |
|---|---|---|---|
| time | 82.65 | < 0.001 | YES |
| Demographic | | | |
| age, years | 18.12 | < 0.001 | YES |
| gender | 10.64 | 0.005 | YES |
| marital status | 4.77 | 0.782 | |
| highest education level | 3.82 | 0.148 | YES |
| employment | 1.51 | 0.470 | |
| living arrangement | 0.20 | 0.906 | |
| duration of gambling problem | 1.60 | 0.450 | |
| Clinical measures | | | |
| GUS | 60.51 | < 0.001 | YES |
| WSAS | 72.89 | < 0.001 | YES |
| DASS-21 | 41.10 | < 0.001 | YES |
| MSPSS | 6.16 | 0.046 | YES |
| AUDIT | 0.38 | 0.826 | |
| AISS | 9.03 | 0.011 | YES |
| GRCS | 59.95 | < 0.001 | YES |
| TAI[b] | 22.92 | < 0.001 | |

Based on factors selected from a literature review, Delphi method, and focus groups conducted prior to this observational study.

Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; DASS-21, Depression Anxiety and Stress Scale (DASS-21); MSPSS, Multidimensional Scale of Perceived Social Support; VAGS, Victorian Gambling Screen; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of Sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory.

[a] Advanced to final model if *P* < .25

[b] Collinearity with DASS-21, therefore did not advance to final model.

The results of the final mixed-effects multinomial logistic regression model are presented in Table 13 (Wald's statistic and *P*-value). Time (by month), gambling urge (GUS), and work and social functionality (WSAS) remained statistically significant ($P < 0.05$) in the final model. A comparison of information indices between the initial model comprising of all variables significant at $P < 0.25$ from univariate analyses (AIC = 455.38, BIC = 553.68) and final model (AIC = 464.23, BIC = 539.29) indicated no overall discernible differences. The decrease in the log likelihood from the initial to the final model of approximately 10 (LL = -202.69 and -213.11 respectively) was largely influenced by the removal of the variable highest education level. This variable was excluded as it was considered a spurious result with a large odds ratio of 4.5 and wide confidence interval (1.19 – 17.07).

Table 13. Final model (mixed-effects multinomial logistic regression) for outcome measured by behavioural changes in gambling.

| Variable | Wald statistic | $P$- value |
|---|---|---|
| time | 40.82 | < 0.001 |
| Demographic | | |
| gender | 4.03 | 0.134 |
| Clinical measures[a] | | |
| GUS | 11.33 | 0.004 |
| WSAS | 26.92 | < 0.001 |
| DASS-21 | 2.35 | 0.310 |
| AISS | 2.81 | 0.245 |
| GRCS | 2.75 | 0.252 |

Final model describing variables associated with the outcome patterns of response with a $P < .05$ on the Wald test for overall significance with remission as base category.
Abbreviations: GUS, Gambling Urge Scale; WSAS, Work and Social Adjustment Scale; DASS-21, Depression Anxiety and Stress Scale (DASS-21); MSPSS, Multidimensional Scale of Perceived Social Support; VAGS, Victorian Gambling Screen; AUDIT, Alcohol Use Disorders Identification Test; AISS, Arnett Inventory of Sensation Seeking; GRCS, Gambling Related Cognition Scale; TAI, Trait Anxiety Inventory.
[a] Higher scores indicate greater problem gambling and related characteristics.

Specific details of the odds ratios and 95 % confidence intervals for the comparison of relapse and continuing to gamble categories with the remission category are presented in Table 14 and discussed in the following paragraphs. Effect sizes of each variable are interpreted while all other variables in the final model are held constant.

### 3.4.1 Time

For each one month change in time the odds of a participant relapsing over remission increased by 26 % and could be as low as 11 % or as high as 43 % while holding all other variables constant. The odds of continuing to gamble over remission decreased by 22 % with each one month change in time and could be as low as 12 % or as high as 31 %.

### 3.4.2 Gambling Urge

For each one unit increase on the Gambling Urge Scale the odds of participants experiencing a relapse over remission increased by 16 % and could be as low as 6 % or as high as 27 %. The odds of participants continuing to gamble over remission increased by 9 % and could be as low as 2 % or as high as 17 %.

### 3.4.3 Work and Social Adjustment

The odds of participants continuing to gamble over remission increased by 18 % with each one unit increase on the Work and Social Adjustment Scale and could be as low as 9 % or as high as 27 %.

Table 14. Multivariable multinomial logistic regression model (variables significant overall at $P < .05$) describing the association between variables and patterns of response measured by behavioural changes.

| Variable | OR[a] (95% CI) | |
| --- | --- | --- |
| | Relapse vs. Remission | Continuing vs. Remission |
| time | 1.26(1.11-1.43)* | 0.78(0.69-0.88)* |
| gender | 0.40(0.11-1.46) | 0.37(0.14-1.00) |
| Gambling Urge Scale (GUS) | 1.16(1.06-1.27)* | 1.09(1.02-1.17)* |
| Depression, Anxiety, Stress Scale (DASS-21) | 0.99(0.95-1.03) | 0.98(0.95-1.01) |
| Arnett Inventory of Sensation Seeking (AISS) | 1.01(0.93-1.09) | 1.05(0.99-1.11) |
| Gambling Related Cognitions Scale (GRCS) | 1.02(0.99-1.05) | 1.02(1.00-1.04) |
| Work and Social Adjustment Scale (WSAS) | 0.94(0.83-1.07) | 1.18(1.09-1.27)* |

* 95 % confidence interval significant at $P < .05$

[a] Odds Ratio = $e^{\beta}$

## 4. DISCUSSION

This observational study sought to identify predictors of relapse in problem gambling. Stratifying the VGS self-harm sub-scale with a cut-off at 21 found 94.9% ($n$ =150) participants were classified as problem gamblers at study commencement. When compared to previous normal population scores, baseline means for depression, anxiety and stress were higher, and in the moderate severity range. Mean scores on the TAI were higher than previous normative data in working adults, college and high school students by at least one standard deviation. Significant differences in baseline data between participants having completed baseline only and those completing at least one follow-up measure are of particular interest. Those who completed only baseline questionnaires were generally younger, comprised of more males, and had higher AISS scores for sensation seeking traits.

The specific focus of this study was to model the odds of a study participant experiencing a relapse in problem gambling following a period of remission as a function of potential predicting variables. Outcome events were determined by two independent methods for comparative purposes: (1) scores on the VGS with a cut-off score of 21, and (2) changes in gambling behaviours. The candidate predictor variables covered a wide range of factors, including general mental health status, levels of social support and functionality, impulsivity, gambling specific measures of urge and cognitions, and socio-demographic factors.

When the outcome status of relapse, remission, or continuing to gamble at each time point was determined with scores on the VGS we found that time, gambling urge, and gambling related cognitions were all significant predictors of relapse. Predictive factors of continuing to gamble over remission were time, gambling urge, gambling related cognitions, and work and social functionality. Significant predictors of relapse when outcome status was determined by self-reported gambling behaviours at each time point were time and gambling urge.

This study has several limitations. Approximately 67 % of the participant population was recruited from a single treatment service, therefore limiting the generalisability of results to the wider population of problem gamblers. However, strengths of this homogenous sample include the minimisation of confounding that may result from a number of treatment/ support types in an observational study. Also, approximately 22 % of participants did not complete a follow-up assessment beyond baseline and therefore conclusions are drawn from a partially observed dataset. Future longitudinal studies with problem gamblers could benefit from the findings of sample characteristics of the dropouts in this study. The identification of individuals that are likely to be lost to follow-up would enable the development of strategies in the study planning phase for keeping in touch with representatives of these sub-groups, and therefore increase credibility of conclusions.

A further limitation of this study was the moderate sample size and the attrition rates at follow up. In addition, the observation period commencing from the time of seeking help, meant that participants needed to experience a remission before relapse could be studied. This led to low numbers of individuals experiencing a lapse and relapse due to a relatively short observation period in which the median time engaged in the study was approximately 8 months. However, the benefit of a prospective observational study is that a wide range of variables could be tested from baseline through each time point in follow-up. This lead to gambling urge emerging as the most significant predictor with both outcome measures and gives confidence that this variable is a powerful predictor of relapse in problem gambling. A larger sample size and longer follow up period may have allowed other factors to emerge as significant predictors.

## 5. CONCLUSION

In summary, our study identified several predictive factors of relapse in problem gambling. Utilising alternative outcome measurements provided the opportunity to compare explanatory models and consider relapse processes beyond a singular definition of relapse. The variations between predictors of relapse with alternate models allows for greater flexibility to assess individual specific processes, and subsequently guide treatment planning. This study also highlighted the challenges presented from a cohort study of problem gamblers.

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## PREDICTORS OF RELAPSE IN PROBLEM GAMBLING STUDY

**Participant Information Sheet**

This is a research project, and you do not have to be involved.

You are invited to take part in a study to determine predictors of relapse in problem gambling. Funded by Gambling Research Australia the project "Predictors of Relapse in Problem Gambling" will investigate key processes of relapse. Outcomes from the study will help improve treatment retention, improve treatment outcomes and help predict those who are vulnerable to relapse.

However, before you decide whether or not you wish to participate, we need to be sure that you understand why we are doing it and what it would involve if you agree. Please read the following information carefully and be sure to ask any questions you have. A therapist will be happy to discuss it with you and answer any questions that you may have. You are also free to discuss it with family, friends and/or your doctor. You do not have to make an immediate decision and your participation is purely voluntary. If you agree to participate, you may change your mind and withdraw. If you do not wish to participate your medical care will not be affected in any way.

Should you choose to participate in this study:

You will be asked to complete questionnaires at commencement of the study and at follow-up of 1, 3, 6 and 12 months. You will be offered an honorarium shopping voucher of $10 at the 3, 6, and 12 month follow-up as acknowledgement of any inconvenience that you may have experienced by participating in the study. A further $20 voucher will be offered on completion of the 12 month questionnaires.

Your records may be reviewed by a psychiatrist. Evaluation will be carried out using information provided by you in questionnaires that will be completed. It is anticipated these questionnaires will take no more than 25 to 40 minutes to complete on each occasion.

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<u>What are the discomforts, risks and side effects?</u>

All procedures used in this study are completely non-invasive. However, should you experience any distress you may wish to discontinue. Also you and/or your therapist may decide for you not to answer any specific question/s considered inappropriate while continuing participation in the study.

There are no known or anticipated risks associated to your participation in this study. If you, as a participant of this research, suffer injury, compensation may, at the discretion of Flinders University of South Australia and or Flinders Medical Centre, be paid without litigation. However, compensation is not automatic and you may have to take legal action in order to receive payment.

You should be aware that neither the therapists involved or the research team will receive any financial benefit for enrolling you in this study. All records containing personal information will remain confidential and no information that could lead to your identification will be released.

In the event that the findings of the study were to be published there will be no personally identifying information and your confidentiality is assured. All data collected in this study will be dealt with in confidence and will be stored securely. The data collected will be used for your own therapy and for the purpose of this study.

Should you require further details about the project, either before, during or after the study, you may contact the Project Officer for this study:

David Smith     Phone: (08) 8404 2610; Email: david.smith2@fmc.sa.gov.au

This study has been reviewed by the Flinders Clinical Research Ethics Committee. Should you wish to discuss the project with someone not directly involved, in particular in relation to matters concerning policies, your rights as a participant, or should you wish to make a confidential complaint, you may contact:

Executive Officer, Research Ethics Committees

Mr David Van der Hoek; Phone:(08) 8204 4507

Flinders Human Behaviour and Health Research Unit, January 2010

**PREDICTORS OF RELAPSE IN PROBLEM GAMBLING STUDY**

## CONSENT TO PARTICIPATION IN RESEARCH

# Statewide Gambling Therapy Service
# & Flinders University

I, _____

      (first or given names)             (last name)

request and give consent to my involvement in the research project:

**Predictors of Relapse in Problem Gambling**

I acknowledge the nature, purpose and contemplated effects of the research project, especially as far as they affect me, have been fully explained to my satisfaction by a research team member, and my consent is given voluntarily.

I acknowledge that the detail(s) of the following has/have been explained to me, including indications of risks; any discomfort involved; anticipation of length of time; and the frequency with which they will be performed.

I understand this study involves my participation in the following:

        Completion of questionnaires at assessment, treatment completion, and at each of the 1-month, 3-month, 6-month, and 12-month follow-up periods.

I understand that I may withdraw at any time without detriment to my ongoing management.

I give permission for my case records to be reviewed by a psychiatrist.

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I am aware that I will be provided with a copy of the completed consent form and information sheet enclosed when I receive the 1-month follow-up questionnaires.

I understand that if information gained in this study is published, I will not be identified and that information will be confidential.

I have understood and am satisfied with the explanations that I have been given.

I understand that my involvement in this research project may not be of any direct benefit to me and that I may withdraw my consent at any stage without affecting my rights or the responsibilities of the researchers in any respect.

I declare that I am over the age of 18 years.

I acknowledge that I have been informed that should I receive an injury as a result of taking part in this study, I may need to start legal action to determine whether I should be paid.

Signature of Participant: _____ Date: ___/___/___

Signature of Witness: _____ Date: ___/___/___
Printed Name of Witness: ................................................................
I _____ have described to _____ the research project and nature and effects of procedure(s) involved. In my opinion he/she understands the explanation and has freely given his/her consent.

Signature: _____ Date: ____/____/____
Status in project: _____

**BASELINE SOCIO-DEMOGRAPHIC QUESTIONS**

# Part 1 – About yourself

1. Today's date
   ☐☐ / ☐☐ / ☐☐☐☐ *(dd/mm/yyyy)*

2. What is your date of birth?
   ☐☐ / ☐☐ / ☐☐☐☐ *(dd/mm/yyyy)*

3. What is your gender?
   ☐ Male ☐ Female

4. Current marital status *(tick one box only)*
   ☐ Single (never married)
   ☐ Married
   ☐ Defacto
   ☐ Separated/divorced
   ☐ Widowed

5. Highest education level *(tick one box only)*
   ☐ Primary school
   ☐ High school
   ☐ Trade certificate
   ☐ TAFE certificate/diploma
   ☐ University degree

6. Employment status *(tick one box only)*
   ☐ Full-time (including self-employed)
   ☐ Part-time (including self-employed)
   ☐ Not working (including looking for work)
   ☐ Retired
   ☐ Unable to work
   ☐ Student
   ☐ Other, please specify _____

7. Current living arrangement *(tick one box only)*
   ☐ Live alone
   ☐ Couple with dependent children
   ☐ Couple without dependent children
   ☐ Single parent
   ☐ Living with parents
   ☐ Other, please specify _____

8. Do you identify as being of Aboriginal or Torres Strait Islander Origin? *(tick one box only)*
   ☐ No
   ☐ Yes, Aboriginal
   ☐ Yes, Torres Strait Islander
   ☐ Yes, both

9. What is your country of birth? *(tick one box only)*
   ☐ Australia
   ☐ Other, please specify: _____

10. Postcode of current address

☐☐☐☐

11. How long has gambling been a problem for you? *(tick one box only)*

☐ Less than 3 months
☐ 3 to <6 months
☐ 6 to <12 months

☐ 1 to <2 years
☐ 2 to <5 years
☐ 5 to <10 years

☐ Ten or more years

# Part 1 – Gambling activities

*Please answer the following question based on your gambling experiences in the past <u>4 weeks</u>.*

1. How often did you gamble during the last 4 weeks? (tick one box only)
   - ☐ Never
   - ☐ Once
   - ☐ Twice
   - ☐ Once a week
   - ☐ Twice a week
   - ☐ Three or more times a week

2. Which of these forms of gambling are causing you problems? *(tick all that apply)*
   - ☐ Gaming machines
   - ☐ TAB/racing
   - ☐ Casino games

   - ☐ Raffles/bingo/bingo tickets
   - ☐ Scratch tickets/x-lotto/Powerball
   - ☐ Keno

   - ☐ Private gambling
   - ☐ Internet gambling
   - ☐ Sports betting

   - ☐ Other, please specify: _____

3. Where did you most recently gamble? (tick one box only)
   - ☐ TAB
   - ☐ Hotel / Club
   - ☐ Casino

   - ☐ On course betting
   - ☐ Phone betting
   - ☐ Internet / Online betting

   - ☐ Bookmaker
   - ☐ Private game
   - ☐ Other, please specify: _____

4. How much money did you spend on gambling during the last 4 weeks? (tick one box only)
   - ☐ None
   - ☐ Up to $100
   - ☐ $101 - $200
   - ☐ $201 - $500
   - ☐ $501 - $1000
   - ☐ $1000 - $1500
   - ☐ Over $1500

5. Are you currently aiming to be abstinent from gambling? Being abstinent means no gambling at all.
   - ☐ Yes          ☐ No

If no- to what level are you aiming to limit your gambling?

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☐ Once a week
☐ Twice a week
☐ Three or more times a week
☐ Daily

# Part 2 – Treatment for gambling problem

*Please answer the following question based on your use of services specific to your gambling experiences in the past 4 weeks.*

*Which of the following services have you used? If you have used a service, how often in the past 4 weeks?*

| Service | If YES, how often? | | |
|---|---|---|---|
| | Once | 2-4 times | > 4 times |
| ☐ Pokies anonymous (PA) | ☐ | ☐ | ☐ |
| ☐ Gamblers anonymous (GA) | ☐ | ☐ | ☐ |
| ☐ Financial counselling | ☐ | ☐ | ☐ |
| ☐ Gambling Helpline | ☐ | ☐ | ☐ |
| ☐ Cognitive behaviour therapy (CBT) | ☐ | ☐ | ☐ |
| ☐ Support group | ☐ | ☐ | ☐ |
| ☐ Self help eg. book, internet | ☐ | ☐ | ☐ |
| ☐ Counselling | ☐ | ☐ | ☐ |
| ☐ Other, please specify | ☐ | ☐ | ☐ |

_____

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# Part 3 – Self Rating Questionnaires

## 2.1 Gambling Urge Scale

*Please rate on a scale of 0 (disagree) to 7 (agree) how you would respond to the following questions:*

| | | Disagree | | | | | | Agree | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | All I want to do is gamble | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | It would be difficult to turn down a gamble this minute | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Having a gamble now would make things seem just perfect | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | I want to gamble so bad that I can almost feel it | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Nothing would be better than having a gamble right now | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | I crave a gamble right now | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## 2.2 Work and Social Adjustment Scale

*Some people's problems affect their ability to do certain day-to-day tasks. How much does your problem affect your ability to do the following things? Please select the box that best describes your situation in each of the five areas of your life*

| | | Not at all | | | Slightly | | | Definitely | | | Markedly | | | Very severely | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | WORK | ☐ | | ☐ | ☐ | | ☐ | ☐ | | | ☐ | ☐ | | ☐ | ☐ |
| 2 | HOME MANAGEMENT *cleaning, tidying, shopping, cooking, looking after home/children, paying bills* | ☐ | | ☐ | ☐ | | ☐ | ☐ | | | ☐ | ☐ | | ☐ | ☐ |
| 3 | SOCIAL LEISURE ACTIVITIES *things done with other people eg. parties, pubs, outings, entertaining etc* | ☐ | | ☐ | ☐ | | ☐ | ☐ | | | ☐ | ☐ | | ☐ | ☐ |
| 4 | PRIVATE LEISURE ACTIVITIES *things done alone eg. reading gardening, sewing, hobbies, walking* | ☐ | | ☐ | ☐ | | ☐ | ☐ | | | ☐ | ☐ | | ☐ | ☐ |
| 5 | FAMILY AND RELATIONSHIPS *forming and maintaining close relationships with others including the people that I live with* | ☐ | | ☐ | ☐ | | ☐ | ☐ | | | ☐ | ☐ | | ☐ | ☐ |

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### 2.3 Depression Anxiety and Stress Scale (DASS-21)

*Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.*

*The rating scale is as follows:*
   *0 Did not apply to me at all*
   *1 Applied to me to some degree, or some of the time*
   *2 Applied to me to a considerable degree, or a good part of time*
   *3 Applied to me very much, or most of the time*

| | | |
|---|---|---|
| 1 | I found it hard to wind down | 0 1 2 3 |
| 2 | I was aware of dryness of my mouth | 0 1 2 3 |
| 3 | I couldn't seem to experience any positive feeling at all | 0 1 2 3 |
| 4 | I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion) | 0 1 2 3 |
| 5 | I found it difficult to work up the initiative to do things | 0 1 2 3 |
| 6 | I tended to over-react to situations | 0 1 2 3 |
| 7 | I experienced trembling (e.g., in the hands) | 0 1 2 3 |
| 8 | I felt that I was using a lot of nervous energy | 0 1 2 3 |
| 9 | I was worried about situations in which I might panic and make a fool of myself | 0 1 2 3 |
| 10 | I felt that I had nothing to look forward to | 0 1 2 3 |
| 11 | I found myself getting agitated | 0 1 2 3 |
| 12 | I found it difficult to relax | 0 1 2 3 |
| 13 | I felt down-hearted and blue | 0 1 2 3 |
| 14 | I was intolerant of anything that kept me from getting on with what I was doing | 0 1 2 3 |
| 15 | I felt I was close to panic | 0 1 2 3 |
| 16 | I was unable to become enthusiastic about anything | 0 1 2 3 |
| 17 | I felt I wasn't worth much as a person | 0 1 2 3 |
| 18 | I felt that I was rather touchy | 0 1 2 3 |
| 19 | 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 |
| 20 | I felt scared without any good reason | 0 1 2 3 |
| 21 | I felt that life was meaningless | 0 1 2 3 |

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## 2.4 Multidimensional Scale of Perceived Social Support (MSPSS)

*We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.*

***Circle the "1" if you Very Strongly Disagree***
***Circle the "2" if you Strongly Disagree***
***Circle the "3" if you Mildly Disagree***
***Circle the "4" if you are Neutral***
***Circle the "5" if you Mildly Agree***
***Circle the "6" if you Strongly Agree***
***Circle the "7" if you Very Strongly Agree***

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | There is a special person who is around when I am in need. | 0 1 2 3 4 5 6 7 |
| 2 | There is a special person with whom I can share my joys and sorrows. | 0 1 2 3 4 5 6 7 |
| 3 | My family really tries to help me. | 0 1 2 3 4 5 6 7 |
| 4 | I get the emotional help and support I need from my family. | 0 1 2 3 4 5 6 7 |
| 5 | I have a special person who is a real source of comfort to me. | 0 1 2 3 4 5 6 7 |
| 6 | My friends really try to help me. | 0 1 2 3 4 5 6 7 |
| 7 | I can count on my friends when things go wrong. | 0 1 2 3 4 5 6 7 |
| 8 | I can talk about my problems with my family. | 0 1 2 3 4 5 6 7 |
| 9 | I have friends with whom I can share my joys and sorrows. | 0 1 2 3 4 5 6 7 |
| 10 | There is a special person in my life who cares about my feelings. | 0 1 2 3 4 5 6 7 |
| 11 | My family is willing to help me make decisions. | 0 1 2 3 4 5 6 7 |
| 12 | I can talk about my problems with my friends. | 0 1 2 3 4 5 6 7 |

## 2.5 Victorian Gambling Screen (VGS)

*Please answer using the scale "never, rarely, sometimes, often, always", ticking the box which is most appropriate. Your answers will be for the last month. So in the last month:*

| | | Never | Rarely | Some-times | Often | Always | Can't Say | N/A |
|---|---|---|---|---|---|---|---|---|
| 1 | Has gambling been a good hobby for you? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2 | Nowadays, when you gamble, is it fun? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3 | Have you gambled with skill? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4 | Nowadays, when you gamble, do you feel as if you are on a slippery slope and can't get back up again? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5 | Has your need to gamble been too strong to control? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6 | Has gambling been more important to you than anything else you might do? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7 | Have you felt that after losing you must return as soon as possible to win back any losses? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8 | Has the thought of gambling been constantly in your mind? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9 | Have you lied to yourself about your gambling? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10 | Have you gambled in order to escape from worry or trouble? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11 | Have you felt bad or guilty about your gambling? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12 | Have you thought you shouldn't gamble or should gamble less? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13 | How often has anyone close to you complained about your gambling? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14 | How often have you lied to others to conceal the extent of your involvement in gambling? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15 | How often have you hidden betting slips, Lotto tickets, gambling money or other signs of gambling from your spouse, partner, children or other important people in your life? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

*If you have a partner, or significant other person, please answer questions 16, 17 and 18 below. If not, please continue to question 19.*

*Again thinking of the last month please answer the questions below*

| | | | Yes | No | N/A |
|---|---|---|---|---|---|
| 16a | Have you and your partner put off doing things together? | | ☐ | ☐ | ☐ |
| 16b | *If yes, was this made worse by your gambling?* | Yes ☐ | Partly ☐ | No ☐ | N/A ☐ |

| | | | Yes | No | N/A |
|---|---|---|---|---|---|
| 17 | Have you and your partner criticised one another? | | ☐ | ☐ | ☐ |
| 17b | *If yes, was this made worse by your gambling?* | Yes ☐ | Partly ☐ | No ☐ | N/A ☐ |

| | | | Yes | No | N/A |
|---|---|---|---|---|---|
| 18 | Has your partner had difficulty trusting you? | | ☐ | ☐ | ☐ |
| 18b | *If yes, was this made worse by your gambling?* | Yes ☐ | Partly ☐ | No ☐ | N/A ☐ |

*Please use the scale as before to answer the next questions, "Never, rarely, sometimes, often, always".*

*In the past 12 months………..*

| | | Never | Rarely | Some-times | Often | Always | Can't Say | N/A |
|---|---|---|---|---|---|---|---|---|
| 19 | How often have you spent more money than you can afford? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20 | How often has your gambling made it harder to make money last from one pay day to the next? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21 | How often have you had to borrow money to gamble with? | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

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## 2.6 The Alcohol Use Disorders Identification Test: Self-Report Version

*Because alcohol use can affect your health and can interfere with certain treatments, it is important that we ask some questions about your use of alcohol. Your answers will remain confidential so please be honest.*

**Please circle the response that best describes your answer to each question.**

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | How often do you have a drink containing alcohol? | Never | Monthly or less | 2-4 times a month | 2-3 times a week | 4 or more times a week |
| 2 | How many standard drinks containing alcohol do you have on a typical day when you are drinking? | 1 or 2 | 3 or 4 | 5 or 6 | 7 to 9 | 10 or more |
| 3 | How often do you have six or more standard drinks on one occasion? | Never | Less than monthly | Monthly | Weekly | Daily or almost daily |
| 4 | How often during the last year have you found that you were not able to stop drinking once you had started? | Never | Less than monthly | Monthly | Weekly | Daily or almost daily |
| 5 | How often during the last year have you failed to do what was normally expected of you because of drinking? | Never | Less than monthly | Monthly | Weekly | Daily or almost daily |
| 6 | How often during the last year have you needed 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 |
| 7 | How often during the last year have you had a feeling of guilt or remorse after drinking? | Never | Less than monthly | Monthly | Weekly | Daily or almost daily |
| 8 | How often during the last year have you been unable to remember what happened the night before because of your drinking? | Never | Less than monthly | Monthly | Weekly | Daily or almost daily |
| 9 | Have you or someone else been injured because of your drinking? | No | | Yes, but not in the last year | | Yes, during the last year |
| 10 | Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down? | No | | Yes, but not in the last year | | Yes, during the last year |

## 2.7 The Arnett Inventory of Sensation Seeking (AISS)

*For each item, please circle which response (A, B, C or D) best applies to you:*

| | | Describes me very well | Describes me somewhat | Does not describe me very well | Does not describe me at all |
|---|---|---|---|---|---|
| 1 | I can see how it would be interesting to marry someone from a foreign country. | A | B | C | D |
| 2 | When the water is very cold, I prefer not to swim even if it is a hot day. | A | B | C | D |
| 3 | If I have to wait in a long line, I'm usually patient about it. | A | B | C | D |
| 4 | When I listen to music, I like it to be loud. | A | B | C | D |
| 5 | When taking a trip, I think it is best to make as few plans as possible and just take it as it comes. | A | B | C | D |
| 6 | I stay away from movies that are said to be frightening or highly suspenseful. | A | B | C | D |
| 7 | I think it's fun and exciting to perform or speak before a group. | A | B | C | D |
| 8 | If I were to go to an amusement park, I would prefer to ride the rollercoaster or other fast rides. | A | B | C | D |
| 9 | I would like to travel to places that are strange and far away. | A | B | C | D |
| 10 | I would never like to gamble with money, even if I could afford it. | A | B | C | D |
| 11 | I would have enjoyed being one of the first explorers of an unknown land. | A | B | C | D |
| 12 | I like a movie where there are a lot of explosions and car chases. | A | B | C | D |
| 13 | I don't like extremely hot and spicy foods. | A | B | C | D |
| 14 | In general, I work better when I'm under pressure. | A | B | C | D |
| 15 | I often like to have the radio or TV on while I'm doing something else, such as reading or cleaning up. | A | B | C | D |
| 16 | It would be interesting to see a car accident happen. | A | B | C | D |
| 17 | I think it's best to order something familiar when eating in a restaurant. | A | B | C | D |
| 18 | I like the feeling of standing next to the edge on a high place and looking down. | A | B | C | D |
| 19 | If it were possible to visit another planet or the moon for free, I would be among the first in line to sign up. | A | B | C | D |
| 20 | I can see how it must be exciting to be in a battle during a war. | A | B | C | D |

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## 2.8 The Gambling Related Cognition Scale (GRCS).

*Please indicate (by circling) the extent to which you agree with the value expressed in each statement*

> *1 = strongly disagree*       *5 = mildly agree;*
> *2 = moderately disagree;*     *6 = moderately agree;*
> *3 = mildly disagree;*         *7 = strongly agree*
> *4 = neither agree or disagree;*

| | | Strongly disagree | | | | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1 | Gambling makes me happier. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | I can't function without gambling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Praying helps me win. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Losses when gambling, are bound to be followed by a series of wins. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Relating my winnings to my skill and ability makes me continue gambling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | Gambling makes things seem better. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7 | It is difficult to stop gambling as I am so out of control. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | Specific numbers and colours can help increase my chances of winning. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | A series of losses will provide me with a learning experience that will help me win later. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10 | Relating my losses to bad luck and bad circumstances makes me continue gambling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11 | Gambling makes the future brighter. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12 | My desire to gamble is so overpowering. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13 | I collect specific objects that help increase my chances of winning | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14 | When I have a win once, I will definitely win again. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15 | Relating my losses to probability makes me continue gambling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16 | Having a gamble helps reduce tension and stress. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17 | I'm not strong enough to stop gambling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18 | I have specific rituals and behaviours that increase my chances of winning. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19 | There are times that I feel lucky and thus, gamble those times only. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20 | Remembering how much money I won last time makes me continue gambling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21 | I will never be able to stop gambling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22 | I have some control over predicting my gambling wins. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23 | If I keep changing my numbers, I have less chances of winning than if I keep the same numbers every time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## 2.9 Trait Anxiety Inventory: STAI Form Y-2

*A number of statements which people have used to describe themselves are given below. Read each statement and then circle a number 1, 2, 3, or 4 to the right of the statement to indicate how you generally feel.*

| | | Almost never | Sometimes | Often | Almost always |
|---|---|---|---|---|---|
| 1 | I feel pleasant | 1 | 2 | 3 | 4 |
| 2 | I feel nervous and restless | 1 | 2 | 3 | 4 |
| 3 | I feel satisfied with myself | 1 | 2 | 3 | 4 |
| 4 | I wish I could be as happy as others seem to be | 1 | 2 | 3 | 4 |
| 5 | I feel like a failure | 1 | 2 | 3 | 4 |
| 6 | I feel rested | 1 | 2 | 3 | 4 |
| 7 | I am "calm, cool, and collected" | 1 | 2 | 3 | 4 |
| 8 | I feel that difficulties are piling up so that I cannot overcome them | 1 | 2 | 3 | 4 |
| 9 | I worry too much over something that really doesn't matter | 1 | 2 | 3 | 4 |
| 10 | I am happy | 1 | 2 | 3 | 4 |
| 11 | I have disturbing thoughts | 1 | 2 | 3 | 4 |
| 12 | I lack self-confidence | 1 | 2 | 3 | 4 |
| 13 | I feel secure | 1 | 2 | 3 | 4 |
| 14 | I make decisions easily | 1 | 2 | 3 | 4 |
| 15 | I feel inadequate | 1 | 2 | 3 | 4 |
| 16 | I am content | 1 | 2 | 3 | 4 |
| 17 | Some unimportant thought runs through my mind and bothers me | 1 | 2 | 3 | 4 |
| 18 | I take disappointments so keenly that I can't put them out of my mind | 1 | 2 | 3 | 4 |
| 19 | I am a steady person | 1 | 2 | 3 | 4 |
| 20 | I get in a state of tension or turmoil as I think over my recent concerns and interests | 1 | 2 | 3 | 4 |

Thank you for completing these questionnaires.

Please return the booklet in the
pre-paid envelope provided.